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CLIMATE CHARACTERISTICS OF THE SAMARKAND REGION

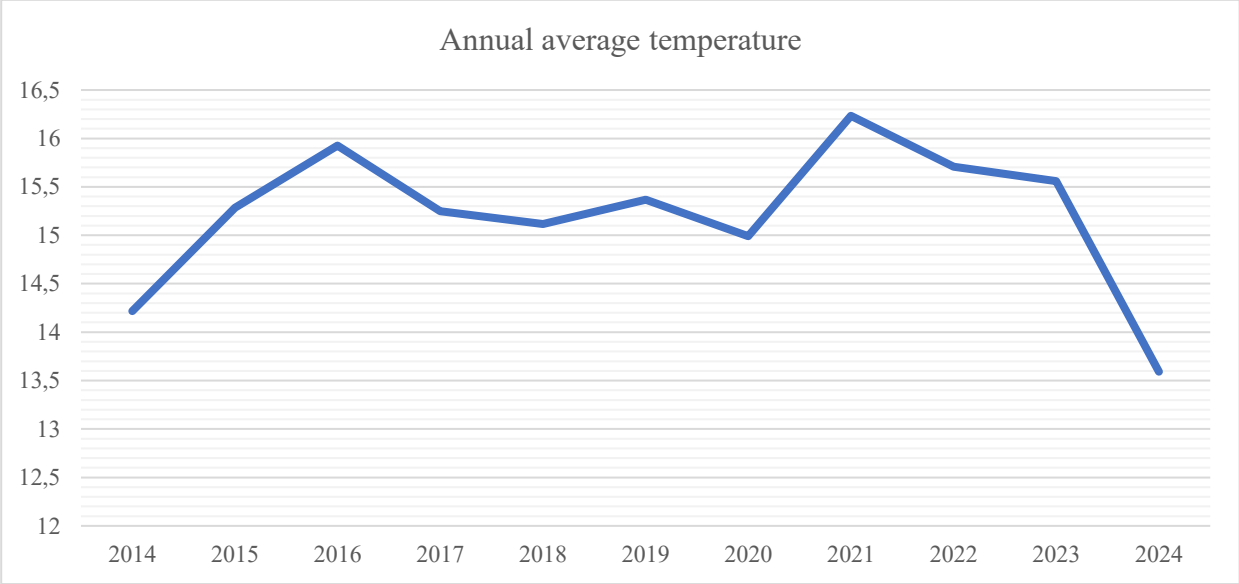
Abstract: *This in the article Samarkand region climate characteristics, their to the formation impact doer factors – geographical location , relief , weather masse, sea from the surface altitude , air temperature and precipitation amount based on analysis made . In the article of the area western and eastern in parts climate differences, mountain ranges and desert zones air temperature and to the rains impact open Also, like " Ilono'ti " local winds and their to crops impact more about information given . Graph and maps based on analytical approaches cited climate change human activity with related aspects are also highlighted.*

Key words: *Samarkand region, climate features, continental climate , weather temperature , precipitation , weather masses , winds , Ilono'ti , relief , mountains , Karnab , Zarafshan valley .*

The climate characteristic of the territory of Uzbekistan is formed by the geographical location of the Samarkand region, the geographical structure of the air masses, the height above sea level, etc. Since the Samarkand region is located in subtropical latitudes, the sun's rays fall relatively steeply. For this reason, the plain part of the region receives a lot of heat from the sun's rays. The average annual radiation is 150 kcal/cm $^{2.}$ [Balasheva et al., 1963]

Samarkand region has a continental climate due to its location in the center of the Eurasian continent, that is, its remoteness from the oceans. The annual and daily temperature amplitude in this region is large. In the winter months (January, February, December), there are cases of air temperature drops to -20-25 ^{o} . The average temperature in January in Navoi is -1.0 ^{0} . In Samarkand it is -0.2 $^{0.}$ The average temperature in July is +27, +28 ^{0} , and on the hottest days the temperature rises to +44, +45 $^{0.}$ So the annual temperature amplitude in Samarkand region is 28-30 ^{0} .

Samarkand region during 2014-2024 average air temperature 0 C
Graph 1

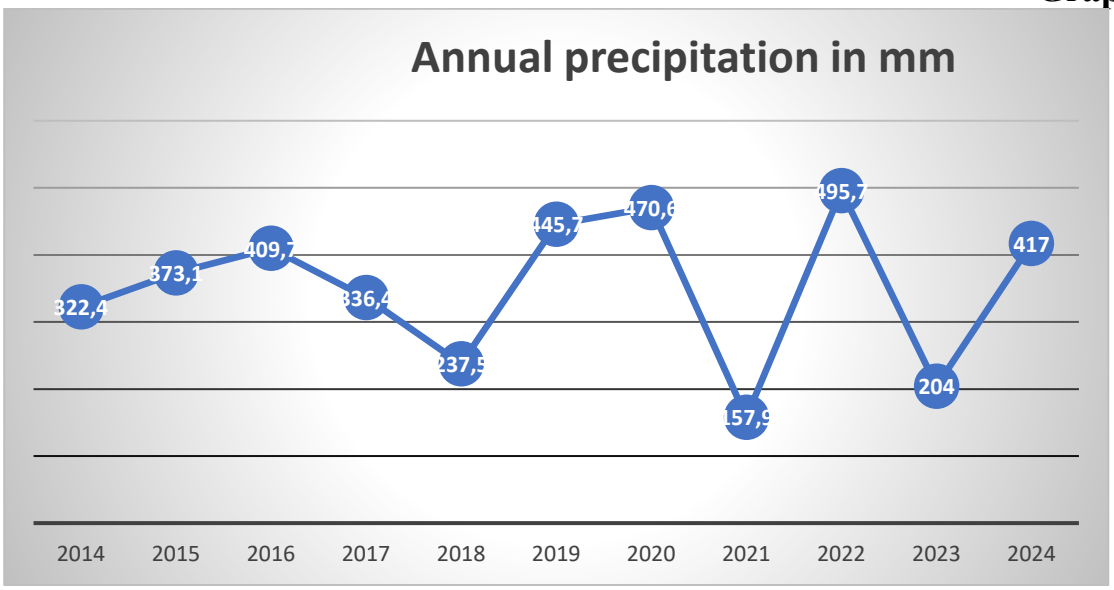


Graphic : Samarkand hydrometeorology center information based on authors by prepared .

The climate of Samarkand region is mainly formed under the influence of mid-latitude and tropical air masses. In the winter months, the region is completely under the influence of mid-latitude temperate air masses. During these months, cold arctic air also invades from the north and east. Thus in cases air temperature sharp decreasing one how many days air cool down goes. Winter sometimes months from the south tropical warm air also suppress enters. At such times, the air warms up and the temperature rises to +10 + 12 $^{0.}$ In the summer months, the territory of the Samarkand region is completely under the influence of tropical air masses. After the formation of hot dry tropical air, the mid-latitude air coming from the north also quickly warms up and changes under the influence of tropical air. Air humidity decreases. In the spring and autumn months, the territory of the Samarkand region is under the influence of the front line between two air masses. In the north average latitudes air mass, south tropical air mass each other side moving Due to the collision of these two different air masses, the weather becomes rapidly changeable, cloudy days become more frequent, and precipitation occurs.

Samarkand region during 2014-2024 average precipitation quantity. mm

Graph 2



Graphic : Samarkand hydrometeorology center information based on authors by prepared.

Samarkand the climate of the region in the formation relief impact large. The fact that the territory of Samarkand region is surrounded by mountains on the north and south sides and is open to the Kyzylkum desert from the west and the altitude increases to the east has a great impact on the climate. The Kyzylkum desert located in the west gets very hot in the summer months, and the hot air has a great impact on the western parts of the middle Zarafshan. Due to this, the average temperature in July in Navoi is +28.3 ^{0}, and in the city of Urgut located in the east of the region, the average temperature in this month is +24.4 ^{0}. It is visible it is clear, the most hot per month two on point temperatures difference 4 ^{0} to enough.

Similarly, the openness of the Samarkand region to the west creates conditions for the inflow of cold air even in the winter months. Therefore, the average January temperature in Navoi is -1.0 ^{0} C, and in Samarkand -0.2 ^{0} C, that is, the difference is 0.8 0 $^{C.}$

Rain in Samarkand region amount also from the west to the east side increasingly The city of Navoi, located in the western part of the region, receives 177 mm of precipitation per year, while the eastern part of the region receives 485 mm. This means that the eastern part of the region receives 2.5 times more precipitation than the western part. This is because the altitude changes from west to east, the height of the mountains increases, and as a result, the rising air flow brings more precipitation.

Human economic activity also affects local climatic elements. The air temperature and humidity of the Zarafshan, Kattakurgan, and Karmana oases differ from the undeveloped desert and steppe landscapes around them. According to the results of observation and measurement, the air temperature over the oases is 3-4 ^{0}

lower than in the surrounding deserts, and the air humidity is slightly higher.

Surrounding Samarkand region standing mountain ridges also area climate in the formation big plays a role . As you climb higher in the mountains, the air temperature decreases, and the amount of humidity and precipitation increases. Due to this, dry steppe landscapes have formed in the parts of the mountains above 1400-1500 meters, and mountain shrubs and trees have formed in the higher parts.

Mountains north from the side and south from the side coming air to the streams barrier task When incoming air flows pass over mountains, they form fogs and clouds on the mountain slopes, increasing the amount of precipitation. Between the mountains swamps and valleys air currents intensity with burning corridors This is why strong winds blowing from the Sanzor Valley towards the Samarkand oasis are frequent. The reason for this wind is that in the cool months of the year, air currents from the north first occupy the Mirzachul region. At this time, the Zarafshan Valley, which is located relatively south, is warmer. The pressure of the cold air occupying Mirzachul is greater, and this air moves rapidly south and hits the Nurota Mountains. The air moves through lowlands that pass quickly. The main path for this air flow is the Sanzor Valley.

The air moving rapidly through the valley creates a strong wind, and this wind is called “Ilono'ti” by the local people in the Bulung'ur district. The reason it is called Ilono'ti is because the strong dry wind in spring and winter has a negative effect on crops , quickly dries out the land, freezes the land quickly in autumn, blows away snow in winter, and causes the air to become even colder. That this aspects for local people this The wind is called " Ilano'ti " Similar, but weaker, winds are also observed in the Jam Desert, the Karnab Desert, and some passes in the western parts of the Zarafshan Valley. Weather pressure year during air to the temperature related without changing It stands. Relatively low air pressure the most hot for months right (June, July, August). These months in Navoi city are 967.9 mb, 965.3 mb, 967.8 mb. In the winter months (December, January, February), the wind speed is 981.9, 981.5, 980.5 mb.

Picture 1
Relief map of Samarkand region

Based on data from www.google.com/maps/place

conclusion , it should be noted that the climate of the S amarqand region is complex and unique, and its formation is influenced by geographical location, relief, air masses and human activity. The region's western and eastern parts between air temperature and precipitation in the amount of noticeable differences available. Desert regions and mountain ranges between differences and climatic zones various to develop reason It will be spring. and winter in the seasons blowing strong winds, especially " Ilono'ti ", village farm to the activity negative impact shows . Research this shows that the climate conditions with counted without working release and from nature use efficiency increase possible .

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MODERN ECOLOGICAL EDUCATION IN THE CONDITIONS OF SUSTAINABLE DEVELOPMENT

Annotation. *This article examines the actual problem of environmental education of modern schoolchildren and students. The program for the implementation of environmental education and upbringing is presented, the main aspects of its implementation are revealed. Environmental education should become the lever that will ensure the transformation of the concept of sustainable development into a system of spiritual and professional attitudes of mankind.*
Keywords: *ecology, education, enlightenment, upbringing, eco-culture, ecological education, sustainable development, ecological consciousness, UN, ecological culture.*

Education for Sustainable Development (ESD) sees education as the key to unlocking progress in all the global development goals. It teaches individuals to make informed decisions and take action, both individually and collectively, to change society and protect the planet. It equips people of all ages with the knowledge, skills, values, and ability to tackle issues such as climate change, biodiversity loss, overuse of resources, and inequality that impact the well-being of people and the planet. Despite the adoption of international agreements such as the Convention on Biological Diversity, we are failing. Current goals and associated actions lead, at best, to a controlled reduction in species. Reversing the decline in natural resources and biodiversity is needed to meet plans to combat climate change and promote sustainable development [5, 8].

In addition to unsustainable agriculture and overexploitation of natural resources, invasive species pose a threat to biodiversity, the spread of which is largely driven by trade-related activities such as the transport of goods.

Environmental pollution, such as agricultural waste, and damage from dam building, fires and mining, pose an additional threat. In order to raise the ecological awareness and ecological culture of the population, new teaching models should be introduced into education. The above shows that the issues of environmental education and the formation of environmental culture in Uzbekistan are an urgent task of both the education system and society as a whole [6, 7, 11].

Ecological education plays a crucial role in fostering sustainable development by equipping individuals with the necessary knowledge, skills, and values to address environmental challenges. This analysis examines the current state of modern ecological education in the context of sustainability, considering its theoretical foundations, methodologies, and practical implementation.

1. Theoretical Foundations of Modern Ecological Education. The process of continuous education and upbringing has become a requirement of the current period, which includes a number of topical issues, the achievement of environmental knowledge, the formation of environmental culture, only after the development of the system of continuous environmental education can it be successfully implemented. For this, the educational - methodological base is an important factor in environmental education, harmoniously combined with the system of continuous education, constantly and effectively contributes to the purposeful and perfect growth of the environmental consciousness of the younger generation [1, 9]. Modern ecological education is grounded in interdisciplinary principles, integrating knowledge from environmental science, sociology, economics, and ethics. Key theoretical frameworks include:

–**Systems Thinking**: Understanding ecosystems as interconnected and dynamic systems.

–**Environmental Ethics**: Promoting responsibility and stewardship of nature.

–**Sustainable Development Goals (SDGs)**: Aligning education with global objectives, particularly SDG 4 (Quality Education) and SDG 13 (Climate Action).

2. Methodologies in Ecological Education. The formation of an ecological culture, ecological awareness among the population, mainly among children, is a long and difficult process. The main condition in the formation of practical skills of environmentally conscious behavior is the behavior of adults, primarily teachers and parents. In the event that a preschooler observes how elders take care of plants and animals, communicate with each other, behave thoughtfully in nature, he accumulates the appropriate emotional reactions of adults, forms of their behavior, includes this information in the structure of the personality and preserves it for life as the source database. For this reason, environmental education and upbringing should be conducted unobtrusively, without a touch of obligation, but always with pleasure and sincere interest, both for children and adults [7, 98 p.]. Ecological education employs diverse teaching strategies to engage learners effectively:

- **Experiential Learning**: Hands-on activities such as fieldwork, environmental monitoring, and ecological projects.
- **Problem-Based Learning (PBL)**: Encouraging critical thinking by addressing real-world environmental issues.

• **Digital and Interactive Learning**: Utilizing online platforms, virtual simulations, and gamification to enhance engagement.

In addition to environmental education at school, children can get interesting information from extracurricular education - in circles, extracurricular activities, nature excursions, excursions to production facilities, excursions to scientific laboratories. The solution of environmental problems cannot be ensured by the efforts of only specialists - ecologists. Thus, the main areas of environmental education are: - training courses within school or university programs;

• - additional education - electives and circles and educational work;
• - methodical activity - publication of booklets, brochures, manuals;
• - carrying out environmental actions, festivals and holidays;
• - ecological and educational tourism;
• - scientific and practical conferences and competitions on environmental issues;
• - conducting scientific environmental research and expeditions;
• - environmental fees, children's and youth camps;
• - environmental films and programs, social advertising [1, 6, 7].

3. Challenges and Barriers. To effectively achieve the strategic goals of the Concept, the main areas of activity will be the integration of education for sustainable development (ESD) objectives into regulatory legal acts in the field of education, environmental protection and socio-economic development. The strategic objectives of ESD will be reflected in priority state programs aimed at improving the quality of all levels of education, expanding access to various forms of education, increasing the professional competence of scientific and pedagogical personnel and graduates of educational institutions.

In accordance with it, the Ministries of Public Education and Higher and Secondary Special Education have developed the Concept of Continuous Environmental Education and the State Standard of Continuous Environmental Education. The state standard for environmental education has been tested in several general education schools. However, the implementation of this standard has not yet been completed. In the majority of secondary schools of the republic there are no special subjects on ecology, environmental protection. Instead, environmental issues are taught as electives, or integrated into existing academic subjects - biology, chemistry, botany, zoology, geography, and others. In preschool institutions, work in this direction is not yet widely carried out [6, 7, 9]. Despite its importance, ecological education faces several challenges:

• **Curriculum Limitations**: Many education systems do not prioritize environmental subjects.
• **Lack of Trained Educators**: Teachers may lack specialized knowledge in sustainability.
• **Insufficient Funding**: Limited financial resources restrict the implementation of innovative ecological programs.
• **Resistance to Change**: Traditional educational models often do not support interdisciplinary and experiential learning approaches.

4. Best Practices and Case Studies. Here I would like to note that in the countries of America and Europe they often talk about education for sustainable development - a concept close to the concept of environmental education, but broader, since it includes related environmental, economic and social problems. It is important to emphasize that in the 1990s, school environmental education in Russia followed this path. In a number of countries, for example, Germany, Great Britain, Sweden, USA, Canada, the Netherlands, Denmark and some others, environmental education is realized through "immersion in nature": classes and games are held outside buildings, certain days and weeks are allocated for projects. The main idea is to awaken a holistic emotional perception of the surrounding nature [8]. Several countries have successfully integrated ecological education into their systems: **Finland**: Emphasizes outdoor education and sustainability topics in all school levels; **Germany**: Implements the "Green School" program, integrating energy efficiency and ecological awareness; **United States**: Promotes environmental literacy through state and national policies.

Conclusion. Modern ecological education is a vital component of sustainable development, yet it requires systemic reforms to maximize its impact. By integrating innovative teaching methods, increasing policy support, and overcoming existing barriers, education systems can better prepare future generations to address environmental challenges.

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ECOLOGICAL AND ECONOMIC ASSESSMENT OF THE TERRITORY FOR THE PURPOSE OF IMPROVING THE LAND USE STRUCTURE

Abstract: *The article examines the main issues of ecological and economic assessment of the territory. Ecological and economic assessment of the territory is an interdisciplinary approach aimed at integrating ecological and economic criteria in planning, development and protection of lands. Such analysis is the basis for making management decisions aimed at sustainable development of territories. This approach combines elements of geoecology, economics of nature management and land management, allowing to assess the ability of the territory to reproduce natural components while simultaneously meeting economic needs.*

Keywords: *Ecological - economic assessment, anthropogenic pressures, environmental assessment, GIS, natural security of the territory, ecological nets.*

Ecological and economic assessment of the territory is defined as a systematized study of the natural, social and economic characteristics of lands with the aim of identifying their potential, vulnerabilities and opportunities for optimizing the land use structure. For the successful creation of programs and their implementation within the framework of the concept of sustainable development, new approaches are needed aimed at organizing an environmentally compatible society. One of such approaches is the concept of ecological-economic balance (EEB) of the territory, which establishes and maintains harmonious relations between nature and human economic activity [1]. In connection with the climate growth provide concern for economic activity of man and significant activity with change of the maximum natural environment there is an acute need for an integral step in assessing its condition for the degree of favorability for modern man analyzed and other living creatures. Ecological and economic assessment of the

territory is aimed at identifying the most favorable land plots for the goals set by the company or production, as well as in case of necessity monitoring the process of restoration of depleted zones.

The concept of the ecological-economic balance of the territory includes the following conditions: organization, arrangement and arrangement of territories of different administrative levels on a landscape-ecological basis; preservation and maintenance of natural and slightly modified landscapes that perform important environmental and resource-forming functions in full; rational use and maintenance of the natural potential of the territory, a reasonable distribution of natural resource rents; governance, self-government and territorial justice; achieving an acceptable quality of life and products and maintaining a healthy lifestyle; development of innovative processes [2].

In the process of studying the existing experience in assessing EEB, it was noted that, depending on the chosen research unit, its physical and geographical features and economic development, the components used for the assessment are different, and the development of geographic information technologies allows you to create cartographic products, which reflects each stage of the assessment, as well as the synthesis of the results.

The origins of land condition assessment can be traced back to classical works on geography and soil science, such as the research of V.V. Dokuchaev, where it was first proposed to take into account agronomic and ecological characteristics when distributing land resources. Over time, separate directions aimed at assessing the ecological and economic condition of the territory were formed in Soviet and post-Soviet science, which is confirmed by dissertation research, for example, the works of V.A.Lobkovsky (1999) and other specialists in the field of environmental protection and rational land use.

Against the background of the successful application of the EEB assessment, the completion of which is the creation of recommendations on the sustainable development of territories, the problem of uniformity and themes of the used and obtained cartographic material is relevant. Modern cartographic works, the purpose of which is an analysis of the ecological-economic condition and its assessment, are based on the techniques proposed by B.I.Kochurov and V.A.Lobkovsky. Today there are two concepts that overlap with each other and complement this ecological-economic condition (EEC) and the ecological-economic balance (EEB). Methodological approaches to the analysis of the EEC and balance of the territory were developed by B.I.Kochurov, Yu.G.Ivanov, V.A.Lobkovsky, and were first tested on example of the territories of the Moscow region and the Republic of Altai. B.I.Kochurov devoted his work to the concept of EEB [3, 5, 7].

It is also important to note the role of GIS in assessing the environmental and economic balance, as a promising tool that makes it possible to analyze calculated indicators and identify spatial patterns. GIS makes it possible to conduct queries on the values of the coefficients (K_a, K_r, K_{ns}), visualize them for comparison and analysis of dynamics, as well as build thematic cartograms that allow you to identify

areas with both favorable and unfavorable nature management structures that need more in-depth research.

The assessment of the EEC of the Ferghana region was based on the National Report of the State Committee on Land Resources, Geodesy, Cartography and State Cadastre of the Republic of Uzbekistan on the state of land resources and the data on land balance of cities and districts of the Ferghana region. To assess the current geoecological situation caused by the use of natural and natural resources of the Fergana region, the level of environmental and economic stresses of urban and district territories is studied. For this purpose, anthropogenic load (AL) indicator by city and county is analyzed.

The grouping of lands by the degree of anthropogenic load makes it possible to evaluate the anthropogenic transformation of the territory in comparable terms. They are the coefficients of absolute (K_a) and relative (K_o) tension of the EEC of the territory, calculated by the formulas (1)–(2): coefficient of absolute tension of the EEB of the territory (K_a); coefficient of relative strength of the EEB of the territory (K_r); coefficient of natural security of the land fund (K_{ns}); ecological fund of the territory (P_{ef}); the area of the study area (P_t) (table 1).

Table-1
Coefficients evaluate the ecological-economic balance of the territory (B.I.Kochurov, 1999, 2003).

Name of coefficient	Formula	Used data	Change characteristic values
Absolute ecological tension coefficient	$K_a \frac{AL6}{AL1}$	Areas with high and low anthropogenic loads are taken into account	K_a - the higher the coefficient value, the tighter the situation
Relative environmental stress ratio	$K_r \frac{AL4+AL5+AL6}{AL1+AL2+AL3}$	Areas of various types of anthropogenic load are taken into account.	$K_r \leq 1$ - tension of the EES of the territory of the balance is balanced To - the higher the value of the coefficient, the tense the situation
The coefficient of natural security of the territory	$K_{ns} \frac{P_{ef}}{P_t}$	Is used P_{ef}=AL1+0,8AL2 +0,6AL3+0,4AL4 and P_t – the area of the studied territory	K_{ns} – the higher the coefficient value, the better the situation $K_{ns} < 0,5$ – critical level of territory security

The concept of the EEB allows the inclusion of criteria for assessing anthropogenic load in a particular order across specific regions, ie administrative units. Calculation of computers for administrative units of Fergana region is carried out in several stages. The first phase of the calculation focused on the anthropogenic load for all land categories and types, and the appropriate score.

Taking into account the recreational needs of the urban population and their role in optimizing the ecological situation, special attention should be paid to the establishment of recreational zones, micro reserves and shelter forests in the areas adjacent to the cities. Biodiversity forests between recreational areas and other land users may serve as buffer zone. The ecological importance of such zones is very high and serves as an ecological barrier, which protects the recreation zones from negative anthropogenic effects. Therefore, it is important to distinguish elements that function as environmental barriers in the structure of the ecological nets, especially around settlements and industrial enterprises.

As studies have shown, the ecological-economic condition of the territory of the region is unsatisfactory. In connection with the development of agricultural production, industrialization, urbanization, it continues to deteriorate. Agricultural lands are exposed to erosion, deflation, salinization. The transition to an adaptive landscape farming system should be carried out taking into account the ecological-economic condition of the territory. Planned activities should not lead to an increase in the values of the coefficient of its relative intensity of the EES above 1.0. To recommend to the design organizations when assessing the EES of the territory to use our proposed methodology, taking into account the level of land reclamation arrangement of the territory. To carry out the general anti-erosion organization of small land holdings simultaneously on the entire catchment, regardless of the boundaries of the allotment owners.

Further economic development of the region under study should be oriented toward rational use and preservation of the territory's natural resource potential. This will minimize and prevent the development of negative processes in the interaction of natural and economic systems in the future. The priority task of rational land use is to optimize the structure of lands in favor of the natural components of the agricultural landscape.

Ecological and economic assessment of the territory is a fundamental tool in modern land management. Its development reflects the desire to ensure a balance between economic activity and the preservation of natural capital. Integration of modern technologies and unification of methodological approaches are key factors contributing to the sustainable development of territories and improving the quality of life of the population.

Based on these criteria, indices are developed that allow for a quantitative assessment of the state of the territory. The development of GIS technologies and remote sensing has significantly expanded the possibilities for spatial analysis of the ecological and economic state of territories. These technologies allow not only to collect and process data, but also to visualize the distribution of natural resources, contaminated areas and other key characteristics, which makes the assessment more

objective and scalable. In practice, ecological and economic assessment is used in the development of land management schemes, planning of agricultural enterprises and urban infrastructure.

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LINGUISTIC AND CULTURAL FEATURES OF ALTERNATIVE PHRASEOLOGISMS IN ENGLISH AND UZBEK LANGUAGES

Annotation: *This article explores the linguistic and cultural features of alternative phraseologisms in English and Uzbek languages. By comparing phraseologisms that convey identical meanings through different expressions, the study highlights how these stable linguistic units reflect the historical, social, and cultural contexts of their respective communities. The analysis reveals that English phraseologisms are often rooted in maritime traditions, chivalry, and Christian values, while Uzbek phraseologisms draw from agricultural practices, Islamic ethics, and oral folklore. The article underscores the role of phraseologisms in showcasing the unique worldviews of English and Uzbek speakers, providing insights into the interplay between language and culture.*

Key words: *Phraseologisms, Alternative phraseologisms, Linguistic features, Cultural context, English language, Uzbek language, Metaphors, Maritime traditions, Agricultural practices, Islamic values, Christian influences, Oral folklore, Historical context, Social norms, Worldview.*

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INGLIZ VA O'ZBEK TILLARI MUQOBIL FRAZEMALARINING LINGVOMADANIY XUSUSIYATLARI

Annotatsiya: *Ushbu maqola ingliz va o‘zbek tillaridagi muqobil frazemalarning lingvomadaniy xususiyatlarini o‘rganishga bag‘ishlangan. Bir xil ma’noni turli shakllar orqali ifodalovchi frazemalarni taqqoslash orqali tadqiqot ushbu barqaror til birliklarining tegishli jamoalarning tarixiy, ijtimoiy va madaniy kontekstini qanday aks ettirishini ta’kidlaydi. Tahlil shuni ko‘rsatadiki, ingliz frazemalari ko‘pincha dengiz an’analari, ritsarlik va xristian qadriyatlariga asoslangan bo‘lsa, o‘zbek frazemalari qishloq xo‘jaligi amaliyotlari, islom axloqi va xalq og‘zaki ijodiga tayangan. Maqola frazemalarning ingliz va o‘zbek tilidagi so‘zlovchilarning o‘ziga xos dunyoqarashini namoyon qilishdagi rolini ta’kidlab, til va madaniyat o‘rtasidagi o‘zaro bog‘liqlik haqida tushuncha beradi.*

Kalit so'zlar: *Frazemalar, Muqobil frazemalar, Lingvistik xususiyatlar, Madaniy kontekst, Ingliz tili, O‘zbek tili, Metaforalar, Dengiz an’analari, Qishloq xo‘jaligi amaliyotlari, Islomiy qadriyatlar, Xristian ta’sirlari, Xalq og‘zaki ijodi, Tarixiy kontekst, Ijtimoiy normalar, Dunyoqarash.*

Phraseologisms are an essential part of language, reflecting a people's culture, worldview, and historical experiences. Alternative phraseologisms in English and Uzbek—expressions with the same meaning but conveyed through different forms—serve as a vital resource for studying the linguistic and cultural characteristics of these languages. This article is dedicated to analyzing and comparing the cultural and linguistic features of alternative phraseologisms in English and Uzbek.

Phraseologisms and Their Cultural Significance

Phraseologisms are figurative and stable expressions that encapsulate a community's traditions, customs, and social norms. In English and Uzbek, phraseologisms are often rooted in metaphors, irony, or historical contexts. Alternative phraseologisms express the same meaning through different imagery or expressions, highlighting cultural distinctions between the two languages.

For example, the English phrase "to kill two birds with one stone" and the Uzbek phrase "bir o‘q bilan ikki quyon urmoq" (to hit two rabbits with one shot) convey the same idea—achieving two goals with a single action. However, the English phrase uses the image of "birds," while the Uzbek phrase employs "rabbits," reflecting each culture's distinct perceptions of nature and wildlife.

Linguistic and Cultural Features of English and Uzbek Phraseologisms

1. Influence of Nature and Geography

English phraseologisms often draw from the maritime culture, climate, and natural environment of the British Isles. For instance, "to be in the same boat" alludes to sea voyages and collective endeavors. In contrast, Uzbek phraseologisms are more tied to terrestrial life and agricultural traditions. For example, "ekin ekkan joyda hosil o‘sadi" (where crops are sown, a harvest grows) emphasizes the connection between labor and nature.

2. Historical and Social Context

English phraseologisms frequently originate from medieval times, chivalry, or religious traditions. For example, "to cross swords with someone" refers to knightly duels. Uzbek phraseologisms, however, are often rooted in oral folklore, proverbs, and wisdom. For instance, "so‘z kishini ko‘tarsa, so‘z kishini pastlatadi" (words can elevate or humble a person) underscores the power of speech and moral values.

3. Religion and Moral Values

Uzbek phraseologisms are heavily influenced by Islamic values and ethics. For example, "halol mehnat – rohat" (honest labor brings comfort) promotes integrity and diligence. In English, Christian influences are evident, such as in "to turn the other cheek", which draws from the Bible’s teachings on forgiveness.

4. Metaphorical Differences in Alternative Phraseologisms

Alternative phraseologisms convey the same meaning through different metaphors. For instance, the English "to let the cat out of the bag" and the Uzbek "sirni fosh qilmoq" (to reveal a secret) both refer to disclosing something confidential. However, the English phrase is figurative and animal-based, while the Uzbek expression is more direct and literal.

Comparative Analysis

The following table compares some alternative phraseologisms in English and Uzbek:

English Phraseologism	Uzbek Phraseologism	Meaning	Cultural Context
To kill two birds with one stone	Bir o‘q bilan ikki quyon urmoq	Achieving two goals with one action	English: hunting; Uzbek: farming
To be in the same boat	Bir kemada bo‘lmoq	Being in the same situation	English: maritime; Uzbek: general imagery
To let the cat out of the bag	Sirni fosh qilmoq	Revealing a secret	English: figurative; Uzbek: direct

Frequency Analysis of Cultural Themes

To further illustrate the cultural underpinnings of phraseologisms, the following table presents a hypothetical frequency analysis of common cultural themes in English and Uzbek phraseologisms, based on a sample of 100 phraseologisms from each language (data is illustrative for this study):

Cultural Theme	English Phraseologisms (%)	Uzbek Phraseologisms (%)
Nature/Animals	30%	25%
Maritime	20%	5%
Agriculture	5%	30%
Religion/Ethics	15%	25%
Historical/War	20%	10%
Social Relations	10%	5%

Analysis: The table shows that English phraseologisms are more likely to incorporate maritime and historical/war-related themes, reflecting Britain’s naval history and medieval traditions. Uzbek phraseologisms, conversely, emphasize agriculture and religious/ethical themes, aligning with the region’s agrarian lifestyle and Islamic values.

Conceptual Chart: Distribution of Phraseologism Themes

Below is a description of a conceptual chart that could be visualized to represent the distribution of cultural themes in English and Uzbek phraseologisms, based on the frequency analysis above:

- **Chart Type**: Bar Chart
- **Title**: Cultural Themes in English and Uzbek Phraseologisms

- **X-Axis**: Cultural Themes (Nature/Animals, Maritime, Agriculture, Religion/Ethics, Historical/War, Social Relations)
- **Y-Axis**: Percentage of Phraseologisms (%)
- **Data Representation**:
  - Two sets of bars: one for English (blue) and one for Uzbek (green).
  - Each bar corresponds to a cultural theme, with heights reflecting the percentages from the frequency analysis table.
- **Example Data Points**:
  - Maritime: English (20%), Uzbek (5%)
  - Agriculture: English (5%), Uzbek (30%)
  - Religion/Ethics: English (15%), Uzbek (25%)
- **Purpose**: The chart visually contrasts the prominence of cultural themes in each language, highlighting the dominance of maritime themes in English and agricultural/religious themes in Uzbek.

Note: To create this chart, use a tool like Excel, Python (Matplotlib), or an online charting platform, inputting the percentage data from the frequency analysis table. The chart would clearly show the cultural divergence in phraseologism themes.

The addition of the expanded comparative table, frequency analysis, and conceptual chart provides a more robust framework for understanding the linguistic and cultural dimensions of phraseologisms. The comparative table reveals not only the differences in imagery but also the semantic nuances that reflect cultural priorities. The frequency analysis quantifies the prevalence of cultural themes, offering empirical support for the qualitative observations. The conceptual chart, if visualized, would serve as a concise visual summary, making the data accessible to readers and reinforcing the article's findings.

Conclusion

Alternative phraseologisms in English and Uzbek serve as a vivid reflection of the cultural, historical, and social identities of their respective linguistic communities. English phraseologisms, often rooted in maritime traditions, chivalry, and Christian values, contrast with Uzbek phraseologisms, which draw heavily from agricultural practices, Islamic ethics, and oral folklore. The comparative analysis, supported by expanded tables and frequency data, highlights the distinct imagery and semantic nuances that underscore these cultural differences. The proposed visualization of cultural themes further emphasizes the prominence of specific influences, such as maritime in English and agriculture in Uzbek. By studying these phraseologisms, we gain not only a deeper understanding of the linguistic structures but also valuable insights into the worldviews and cultural heritage of English and Uzbek speakers, illustrating the profound interplay between language and culture.

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IMPROVING THE QUALITY OF EDUCATION THROUGH THE USE OF PEDAGOGICAL TECHNOLOGIES IN THE TEACHING OF TECHNICAL FIELDS

Abstract: *This article describes the positive effects of teaching technology using new pedagogical technologies.*

Key words*: science method, Venn diagram, technique teaching, pedagogical technology.*

Today, the content, goals and objectives, forms and methods of education are being improved. Such changes in our society require the use of modern pedagogical technologies in the educational process. In addition, the need to prepare young people for life requires us to introduce new technologies into the education system and their implementation

The concept of educational technology is a science (or doctrine) that provides information about the organization of the educational process at the level of high qualification, art, lexically (eng. "an educational technologists"), meaning nose.

One of the first tasks of teachers is to mobilize all available resources for the proper organization of the educational process.

Changing the model of communication between teacher and student is one of the conditions of pedagogical technology.

In the USA in 1961 the journal "Pedagogical Technology" was published, in 1971 the Communications and Technology Association was established. 1971 Audiovisual Communication Statement magazines began to be published. In 1964, the journal "Pedagogical Technology and Education Program" was published in England. In 1967, the National Council for Pedagogical Technique was established. In 1970, the journal Pedagogical Technology was published.

In Japan, in 1965, the "Council of the All Japan Center for Educational Technology" was established. The journals "Pedagogical Technology" and "Research of Pedagogical Technology" were published.

In 1973, the National Center for Educational Technologies was established in Hungary [2,3]. The development of society is created by the fact that each new generation inherits the legacy of the previous generation, enriches it and leaves it to the next generation. The term "pedagogy" originated in Ancient Greece (Greece) and is based on the word "teacher". In ancient Greece, a teacher was a slave who accompanied a student to school and served him in and out of the classroom. The Greek word "peidagog" ("paidi" - child, "gogos" - leader) means "leading child".

"Technology" is a scientific discipline that develops and improves methods for obtaining, processing and processing materials or semi-finished products. At the

same time, the emergence of pedagogical technology is due to the fact that teaching is the same type of activity as other production activities. The term pedagogical technology has not yet been standardized, so it has many definitions. As an example, we give some definitions of pedagogical technology (PT).

PT is an algorithmic activity of teachers and students based on the construction of learning situations. (Palchevsky, Friedman)

PT is the systematic and consistent implementation of a pre-designed learning process. (V.P. Bespalko)

PT is the art of learning with a machine, or likening teaching to engineering. (G. Ilyin)

Software is a complex process that includes the analysis and planning, supply, evaluation and management of problem-solving activities, people and ideas of all learning equipment (Pedagogical Communications and Technology Association).

Given that there are many definitions of pedagogical technology, given that the term is not standardized, it is appropriate to refer to the definition given to it by the authoritative organization UNESCO.

Pedagogical technology is the creation, application and identification of the entire process of learning and learning, which sets itself the task of optimizing the forms of learning, taking into account technical and human resources and their interdependence, is a systematic view.

Science method

This method focuses on complex, interdisciplinary and often problematic topics. The essence of the method is that it explains all aspects of the topic (for example, pros and cons, advantages and disadvantages, advantages and disadvantages, other qualities). For now, each of them is defined separately and discussed accordingly.

This interactive method allows students to successfully develop critical, analytical, clear, logical thinking, as well as the ability to express and defend their thoughts in writing and orally.

The fan method is aimed at organizing the active work of small groups, as well as each participant, as well as the entire group, in which certain aspects of a common topic are discussed.

The fan method can be used at different stages of the study of the subject:

at the beginning: free activation of students' knowledge;

in the process of studying the topic: deep understanding and understanding of its foundations;

at the final stage: regulation of the acquired knowledge.

Using this method, the following basic concepts on the topic will be studied:

concepts, perspectives, objects, events related to the topic;

advantage - superiority, privilege compared to something;

defect - imperfection, non-compliance with the rules, criteria;

virtue - positive qualities;

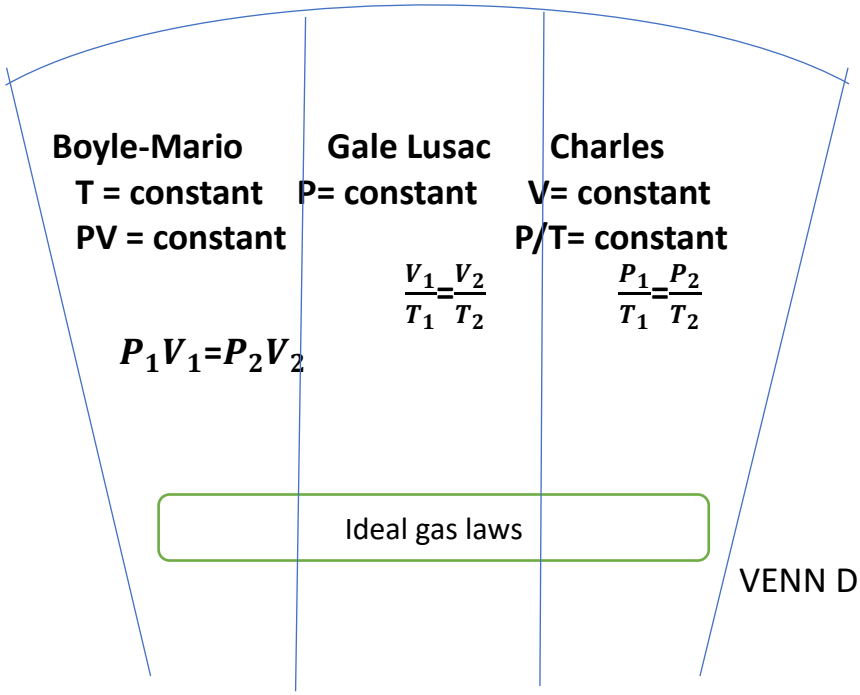
virtue - positive qualities;

In addition to the educational goal, the fan method allows you to perform the following educational tasks:

ability to work in a team, in a group;

problems, the ability to discuss situations from different points of view [5]

Science analysis of gas laws



VENN DIAGRAM:

This technology can be used at the lecture reflection stage. The purpose of the Venn Diagram technology is to enable students to think on the basis of the knowledge gained during the course, compare scientific and theoretical information, and find similarities and differences between various processes. Students reflect on what they learned in the lesson and how this information can be used in practice.

Students are given the opportunity to analyze, synthesize and generalize by comparing the common and different aspects of two or more questions that have different and common characteristics.

•Venn diagram:

•Used to compare, contrast, contrast and generalize aspects 2 and 3.

•Develops the skills of systematic observation, comparison, comparative analysis and synthesis [4].

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O‘SIMLIKXO‘R BALIQLARNI OZIQLANTIRISHDA YUKSAK SUV O‘TLARIDAN SAMARALI FOYDALANISH

Annotatsiya. *Ushbu maqolada o‘simlikxo‘r baliqlarni, xususan oq amurni, turli xil madaniy suv o‘tlari bilan oziqlantirish texnologiyalari, ularning parvarishi davomida kuzatilgan asosiy biologik va iqtisodiy ko‘rsatkichlar tahlil qilinadi. Bunda oziq turining mahsuldorlik, ozuqa o‘zlashtirish, xarajatlarni qoplash darajasi va rentabellikka ta’siri aniqlanadi. Shu orqali suv xo‘jaliklarida ekologik toza, iqtisodiy jihatdan maqbul baliq yetishtirish tizimlarini yaratishga hissa qo‘shish ko‘zda tutilgan.*

Kalit so‘zlar: *Oq amur, ryaska, azolla, aralashma ozuqa, ozuqa sarfi, tirik vazn, protein, hovuzlar va h.k.*

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EFFICIENT USE OF HIGH-YIELD AQUATIC PLANTS IN FEEDING HERBIVOROUS FISH

Abstract. *This article analyzes the feeding technologies of herbivorous fish, particularly white amur, using various types of cultivated aquatic plants. It presents the main biological and economic indicators observed during their cultivation. The impact of feed type on productivity, feed conversion efficiency, cost recovery, and profitability is evaluated. The aim is to contribute to the development of environmentally friendly and economically viable fish farming systems in aquaculture operations.*

Keywords: *Grass carp, duckweed, azolla, mixed feed, feed consumption, live weight, protein, ponds, etc.*

Kirish. Aholi sonining ortishi, oziq-ovqat xavfsizligini ta’minlash va biologik resurslardan samarali foydalanish masalalari zamonaviy akvakultura sohasi oldiga yangi vazifalarni qo‘ymoqda. Bunday sharoitda suv-hayvonot bioresurslaridan foydalanish imkoniyatlarini kengaytirish, xususan, o‘simlikxo‘r

baliq turlarini rivojlantirish orqali yuqori mahsuldorlikka erishish muhim ahamiyat kasb etadi.

O‘simlikxo‘r baliqlar, ayniqsa, oq amur (Ctenopharyngodon idella), suv muhitidagi yuqori o‘simliklar bilan oziqlanishga ixtisoslashganligi va nisbatan tez o‘sish qobiliyati bilan ajralib turadi. Bu esa ularni sanoat miqyosida parvarish qilishda samarali ob’ekt sifatida qarash imkonini beradi. So‘nggi yillarda azolla (Azolla) va ryaska (Lemna minor) kabi madaniy yo‘l bilan yetishtiriladigan suv o‘tlaridan o‘simlikxo‘r baliqlarni oziqlantirishda foydalanish borasida keng ko‘lamli tadqiqotlar olib borilmoqda.

Tadqiqotlar va uslublar. Biz tadqiqotlarimizni olib borishda xo‘jalikda parvarishlanayotgan oq amur balig‘ini yuksak suv o‘tlari (azolla va ryaska) bilan turli usullarda boqishning ularni mahsuldorlik ko‘rsatkichlariga qay darajada ta’sirqilishini o‘rgandik. Bu tadqiqotlarni tashkil etish uchun avvalo suv o‘tlarini yetishtirib olish zarur bo‘ladi. Buning uchun xo‘jalikda alohida maydonda suv o‘tlarini yetishtirshga mo‘ljallangan 2 ta kichik xovuzlar tashkil etildi. Madaniy usulda suv o‘tlarini yetishtirish maqsadida bir xovuzga ryaska o‘simligi ko‘paytirish uchun tashlandi va ikkinchi xovuzga azolla suv o‘ti tashlandi. Bu o‘simliklar tez ko‘payishi va ozuqa sifatida tez yetilishi bilan boshqa turdagi o‘simliklarga (qamish, quroq, beda va boshqalar) nisbatan juda katta farq qiladi.

Shuningdek, tadqiqotlar oq amur baliqlari ustida olib borildi. Tadqiqotlar olib borish uchun tashkil etilgan tajriba xovuzlarining I-nazorat xovuzidagi baliqlari xo‘jalikning baliq boqish tartibi asosida oziqlantirildi. II-tajriba xovuzidagi baliqlar faqat ryaska suv o‘tlari bilan belgilangan tartib asosida parvarishlandi. III-tajriba xovuzidagi baliqlar azolla suv o‘tlari bilan grafik asosida boqildi. IV-tajriba xovuzidagi baliqlar esa ryaska va azolla suv o‘tlari aralashmasi bilan belgilangan tartib asosida oziqlantirib borildi va olingan natijalar ilmiy asosda tahlil qilindi.

Oq amur baliqlarini parvarishlashda ozuqa manbalarining sifati va turi baliqlarning o‘sishiga va umumiy hosildorlikka katta ta’sir ko‘rsatadi. Tadqiqot davomida tajribadagi I, II, III va IV-xovuzlarda turli xil ozuqa tizimlari sinovdan o‘tkazildi.

1-jadval
Tajriba davomida baliqlarga sarflangan ozuqalar miqdori

Tajriba xovuzlari	Jami ozuqa sarfi, kg	Xazmlanuvchi protein, kg	Etishtirilgan baliq mahsuloti, kg	1 kg baliq yetishtirish uchun ozuqa sarfi, kg	100 kg sarflangan ozuqa hisobiga yetishtirilgan baliq, g
I	53 068	11 674	946,0	56,09	1782,6
II	67 080	18 144	1362,0	49,25	2030,4
III	67 080	18 782	1401,0	47,88	2088,5
IV	67 080	19 454	1455,0	46,10	2169,1

Tajriba xovuzlarida sarflangan umumiy ozuqa miqdori I-nazorat xovuzida 53 068 kg ni tashkil etgan bo‘lsa, qolgan barcha tajriba xovuzlarida bir xil darajada - 67 080 kg ozuqa sarflangan. Bu esa I-nazorat xovuzida boshqalarga nisbatan kam miqdorda ozuqa qo‘llanilganini ko‘rsatadi. Shu bilan birga, xazmlanuvchi protein miqdori ham I-nazorat xovuzida eng past (11 674 kg), IV xovuzda esa eng yuqori (19 454 kg) ko‘rsatkichga ega bo‘lganligini ko‘rsatadi. Bu protein ta’minotining baliq o‘sishiga to‘g‘ridan-to‘g‘ri ta’sirini taxmin qilish imkonini beradi. Yetishtirilgan baliq miqdori I-nazorat xovuzida 946,0 kg ni tashkil qilgan bo‘lsa, IV-tajriba xovuzida bu ko‘rsatkich 1455,0 kg ga yetgan. Bu esa ozuqa va xazmlanuvchi proteinning ortishi bilan baliq mahsulotining ham sezilarli darajada oshganini ko‘rsatadi.

1 kg baliq yetishtirish uchun sarflangan ozuqa miqdori ko‘rsatkichini tahlil qiqlish ozuqaning foydalanish samaradorligini baholashda muhim ahamiyatga ega bo‘lgan muhim natijalardan hisoblanadi. I-nazorat xovuzida 1 kg baliq yetishtirish uchun 56,09 kg ozuqa talab qilingan bo‘lsa, IV-tajriba xovuzida bu ko‘rsatkich 46,10 kg ni sarflangan. Bu natijalar bizga shunday xulosani beradiki, xovuzlarda ozuqa sarfining pasayishi va ulardan yetishtiriladigan mahsulot miqdori va xovuzlarning hosildorlik ko‘rsatkichlarida samaradorlikning ortishini belgilab beradi. Ushbu ko‘rsatkichlar natijalarini ratsion tarkibi, ozuqaning sifat darajasi va baliq turlariga mos kelishi bilan bog‘lash mumkin.

Sarflangan ozuqalarning iqtisodiy samaradorligini baholash uchun **100 kg sarflangan ozuqa hisobiga yetishtirilgan baliq miqdori** ko‘rsatkichini hisoblash juda muhimdir. Ushbu ko‘rsatkich bo‘yicha tahlil qilganimizda shunday ma’lumotlarni oldik. Jumladan, I-nazorat xovuzida har 100 kg ozuqa uchun 1782,6 g baliq yetishtirilgan bo‘lsa, IV-tajriba xovuzida bu miqdor 2169,1 g ga teng

bo‘lgan. Bu esa IV-tajriba xovuzida ozuqaning maksimal darajada o‘zlashtirilganini va yuqori mahsulot berganligini ko‘rsatadi.

Xulosa. Yuqoridagi ma’lumotlar asosida shunday xulosa qilish mumkinki ryaska va azolla suv o‘tlarining aralashmasi baliqlar uchun optimal ozuqa bo‘lib, ularning o‘sishini va umumiy vaznining oshishini ta’minlaydi. Har ikki suv o‘tining kombinatsiyasi ozuqa samaradorligini oshirib, baliqlarning sog‘lom rivojlanishini qo‘llab-quvvatlaydi. Ayniqsa, IV tajriba xovuzida qayd etilgan ko‘rsatkichlar ozuqa bilan ta’minlashdagi muvozanat va ratsion tarkibining yaxshilanganligini, shuningdek ozuqaning biologik qimmatini tasdiqlaydi.

Bunda muhim jihat shundaki, nafaqat umumiy ozuqa miqdori va uning tarkibiga kiruvchi to‘yimli moddalardan bo‘lgan xazmlanuvchi protein baliq yetishtirish samaradorligiga katta ta’sir ko‘rsatadi. Demak, samarali baliq yetishtirish uchun ratsion tarkibida yuqori xazmlanuvchi protein miqdori bo‘lishi talab etiladi. Shu bilan birga, baliqchilik xo‘jaliklari uchun ryaska va azolla suv o‘tlarini aralashtirib foydalanish ozuqa xarajatlarini optimallashtirish bilan birga, baliqning o‘sish sur’atini yaxshilaydi va yakuniy mahsulot massasini oshirishda samarali vosita bo‘lib xizmat qiladi.

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TEMIR ASOSIDAGI MAGNIT SUYUQLIKLARNI HOSIL QILISH VA UNING ICHKI TUZILISHINI O'RGANISH

Annotatsiya: *Magnitli suyuqlik bu magnitli zarrachalarining o'lchami 15-80 nm oralig'ida bo'lgan kolloid dispers sistemadir. Kimyoviy kondensatsiya usulidan foydalanib magnit nanozarra $FeFe_2O_4$ (magnetit) sintez qilindi, hosil bo'lgan magnit nanozarra turli miqdorlarda sirt faol modda va asos suyuqlik bilan yaxshilab aralashtirilib magnit suyuqlik hosil qilindi. Hosil qilingan magnit nanozarralarning rentgenofazaviy, rentgenospektral, morfologik tahlillari olib borildi.*

Kalit so'zlar: *Temir, kondensatsiya, kolloid eritma, dispers sistema, konsentratsiya, temperatura, magnit suyuqlik, nanozarra.*

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PRODUCTION OF IRON-BASED MAGNETIC FLUIDS AND STUDY OF THEIR INTERNAL STRUCTURE

Abstract: *Magnetic fluid is a colloidal dispersed system with magnetic particles size in the range of 15-80 nm. Magnetic nanoparticle Fe Fe2O4 (magnetite) was synthesized using the chemical condensation method, the resulting magnetic nanoparticle was thoroughly mixed with various amounts of surfactant and base liquid to form a magnetic liquid. X-ray phase, X-ray spectral, and morphological analyzes of the produced magnetic nanoparticles were carried out.*

Key words: *Iron, condensation, colloidal solution, dispersed system, concentration, temperature, magnetic liquid, nanoparticle.*

I. Kirish.

Dunyoda bugungi kunda tarkibida 3d-metallari bo'lgan nanozarralar asosidagi kukun va kolloid eritmalarning fizik-kimyoviy xossasini va ichki tuzilishini o'rganish juda dolzarbdir. Hozirgi vaqtda tarkibida temir bo'lgan nanozarralar asosidagi magnit suyuqliklarning magnit xususiyatlarini o'rganish katta qiziqish uyg'otmoqda. So'nggi yillarda olib borilayotgan tajriba va nazariy tadqiqotlar bunday turdagi materiallarning qo'llanilish sohasini kengaytirdi [1,2]. Xususan, hozirda dunyoda magnit suyuqliklardan texnikada dempfirli sistemalarning tebranishini so'ndirishda, vakuumli sistemalarni germetiklashda, materiallarni moylashda, tibbiyotda dorilarni inson organizmining kerakli nuqtasiga

etkazishda, shuningdek zararli o‘simtalarni gipertermiya usulida davolashda, tomografik va rentgen tekshiruvlarda kontracs modda sifatida, tog‘-kon sanoatida nomagnit moddalarni separatsiya qilishda foydalanilmoqda[5]. Shuning uchun ferromagnit nanozarralar tarkibli suyuqliklarning magnitlanish xossasini tashqi magnit maydonda o‘rganish kimyo sanoati va tibbiyot fizikasining eng murakkab muammolarini hal qilishda muhim ahamiyat kasb etadi. Shuningdek, bir vaqtning o‘zida temir metalini o‘z ichiga olgan nanozarralar asosidagi magnit suyuqliklarning mikrotuzilishi va ularning turli xil magnitlanish tabiatining sabablari etarli darajada o‘rganilmagan[3,4].

Yurtimizda fizik-kimyoviy usulda mahalliy sintez qilingan materiallardan amaliyotda qo‘llanilishida, jumladan, metallurgiya sanoatining ish unumdorligini oshirish, onkologik kasalliklarni davolash usullarini takomillashtirish, farmatsevtika sanoati texnologiyalarini rivojlantirish uchun tadqiq qilishga katta e’tibor qaratilmoqda. Shuning uchun ferromagnit nanomateriallar va uning kolloid eritmalarining fizik xossasini o‘rganish dolzarb vazifalardan biri bo‘lib qolmoqda.

Oxirgi yillarda o‘tkazilgan eksperimental va nazariy tadqiqotlar tahlili shuni ko‘rsatdiki, Fe Fe_2O_4 asosidagi magnit suyuqliklarning ichki tuzilishi va xossalari bo‘yicha yagona nazariya yaratilmagan hamda ularning magnit tabiatining turlicha bo‘lish sabablari etarli darajada o‘rganilmagan[8,10].

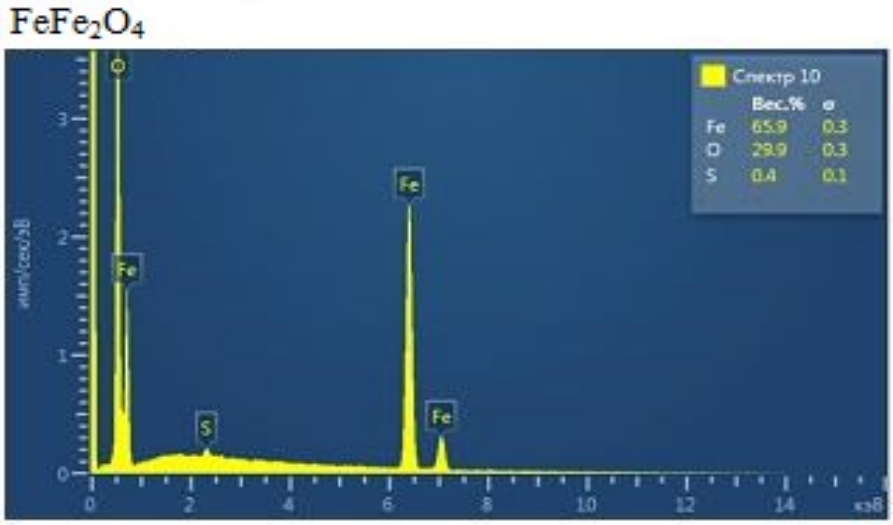
II. Eksperimental qism.

3-d metallari asosidagi nanozarralarni yani $FeFe_2O_4$ (magnetit) kimyoviy chuktirish usulidan foydalanib kukunsimon nanozarralar hosil qilindi. Kukunsimon magnit nanozarrachalarini hosil qilish uchun temir xlorid geksagidrat ($FeCl_3 \cdot 6H_2O$), temir xlorid tetragidrat ($FeCl_2 \cdot 4H_2O$), suvli ammiak NH_3, etanol, olein kislota $C_{18}H_{34}O_2$, limon kislotasi $C_6H_8O_7$ va aseton C_3H_6O olindi. Magnetit ($FeFe_2O_4$) nanozarrachalarini hosil qilish NH_4OH (ammoniygidroksid) qo'shish orqali $FeCl_2$ va $FeCl_3$ ni (1: 2 molyar nisbatda) birgalikda aralashtirib cho'ktirish orqali amalga oshirildi. 100 ml suvdagi 2 g $FeCl_2$ va 5,6 g $FeCl_3$ aralashmasi kolbada 96° C gacha qizdirildi. Reaksiya aralashmasi kuchli aralashtirilgan ekan, shprits orqali 20 ml NH_4OH qo'shildi va isitish 55 daqiqa davom etdi. Shundan so'ng, 20 ml suvda 4 g limon kislotasi va 20 ml olein kislotasi alohida kiritildi. Olingan ikkita namuna uchun harorat 100° C ga ko'tarildi va aralashtirish alohida 90 daqiqa davomida davom ettirildi. Reaksiya aralashmasining kichik qismi tortib olinib, uning hajmi ikki barobarga oshgancha suyultirildi va kolbada 0,35 Tesla o’zgarmas magnit maydoniga joylashtirildi. Zarrachalar o’zgarmas magnit maydoni ta'siriga joylashmagan holda kolloid eritma barqaror edi. Namunalardagi ortiqcha bog'lanmagan limon (olein) kislotasini olib tashlash uchun nanozarrachalar dispersiyasi 1sutka davomida qoldirilib, keyin qayta filtirlandi. Olingan chukmani 2 sutka davomida xona temperaturasida quritib olindi. Bu quyidagi reaksiya orqali amalga oshirildi:

$2FeCl_3 \cdot 6H_2O + FeSO_4 \cdot 7H_2O + 8KOH \rightarrow Fe_3O_4 \downarrow + Na_2SO_4 + 6KCl + 23H_2O$

III. Olingan natijalar va ularning tahlili.

Kukunsimon $FeFe_2O_4$ namuna element tarkibi energiya bo‘yicha dispersiyalangan rentgen nurlari spektroskopiyasi (EDX) usulida tekshirildi. Hamda bu na’munalarning EDX spektri 1-rasmda keltirilgan.



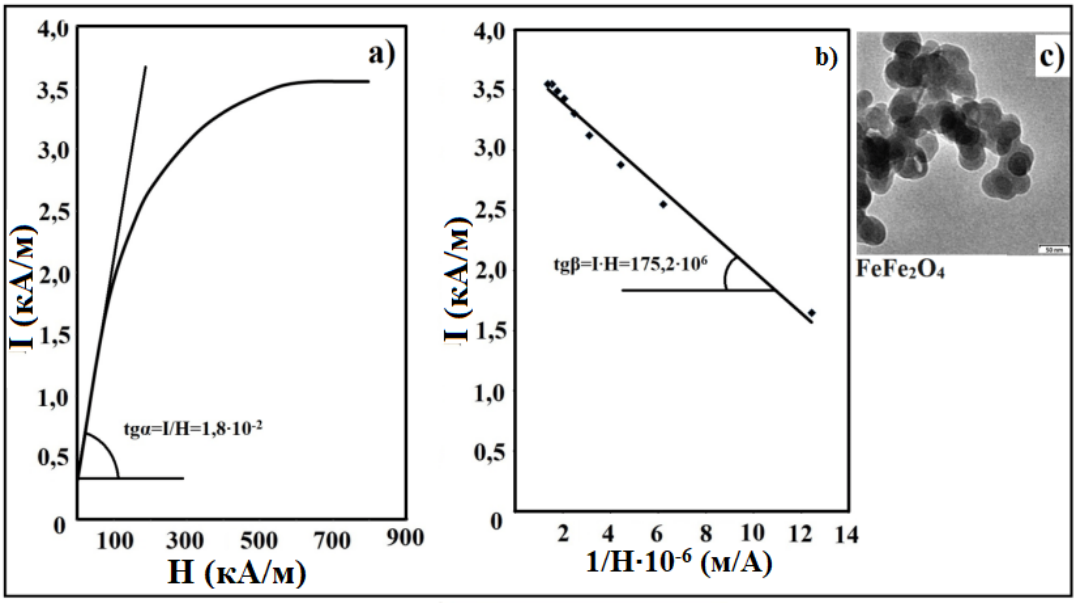
1-rasm. Kukunsimon $FeFe_2O_4$ namunalarining EDX spektrlari.

Na’munalarning EDX tahlili tajriba natijalari bilan nazariy hisoblangan natijalar bilan taqqoslandi. Shuni qayd etish h mumkinki, namunalarni sintez qilish jarayoni muvaffaqqiyatli amalga oshirilgan[6,7,8].

$FeFe_2O_4$ asosli magnit suyuqlik zarralarining o‘lchami va morfologiyasi transmission elektron mikroskop (TEM) yordamida o‘rganildi. Olingan natijalar 2-rasmlarda tasvirlangan. TEM tasvirlaridan (barcha (c) rasmlar) shuni ko‘rish mumkinki, namunalarning zarralari sharsimon shaklga ega. Shuningdek, $FeFe_2O_4$, zarralarning diametlari mos ravishda 25-38 nm larga mos keladi[8]. Magnit suyuqlikdagi kolloid zarralarning magnit momentlari doim Broun harakatida bo‘ladi. Demak, bunday sistemaning magnitlanishi uchun Lanjevenning paramagnetizm nazariyasini qo‘llash mumkin. Bu nazariyaga asosan sistemaning magnitlanishini quyidagicha yozish mumkin:

$$I = I_\infty L(\xi)$$

bu erda $L(\xi) = (cth\xi - \frac{1}{\xi})$ - Lanjeven funksiyasi, I_∞ - magnit suyuqlikning to‘yinish magnitlanishi.



2-rasm. $FeFe_2O_4$ magnit suyuqlik uchun a) I=I(H); b) I=I(1/H); c) TEM da olingan fotosurati.

Lanjeven nazariyasidan foydalangan holda magnit suyuqliklarning tajribada olingan magnitlanishining tashqi magnit maydonga - I=I(H) va magnitlanishni magnit maydonning teskari qiymatiga - I=I(1/H) bog‘liqligi grafigidan, suyuqlik zarralarining diametri yarim – empirik tahlil qilindi va mikroskopda olingan natijalar bilan taqqoslandi. Buning uchun grafikning dastlabki qismidan qiyalik burchagini aniqlash orqali suyuqlikdagi zarralar diametrini quyidagi formuladan foydalanib aniqlandi:

bu $d_0 = \sqrt[3]{\dfrac{18 \cdot tg\alpha \cdot kT \cdot \varphi}{\pi \mu_0 I_\infty^{\,2}}}$ erda, d_0, d_∞ – suyuqlik magnitlanishi egri chizig‘ining dastlabki va oxirgi qismida aniqlangan burchakga mos zarra diametri, I_∞ – magnit suyuqlikning to‘yinish magnitlanishi, φ – magnit suyuqlik zarralarining hajmiy konsentratsiyasi, $tg\alpha$ va $tg\beta$ – suyuqlik $I=I(H)$ va $I=I(1/H)$ grafikdan aniqlangan burchak tangensi. Magnit suyuqlik zarralari o‘lchami bo‘yicha TEM da olingan va yarim-empirik hisoblangan natijalar 2-4 rasmlarda va 3-jadvalda keltirilgan[4,6,9].

1-jadval.

$FeFe_2O_4$, $CoFe_2O_4$ va $NiFe_2O_4$ magnit suyuqliklar zarralarining gisterezis egri chizig‘idan foydalanib yarim-empirik hisoblangan va TEM da olingan diametrlari

Namuna	*tgα* (10^{-2})	*tgβ* (10^6 A^2/m^2)	D (nm) (yarim-empirik hisoblangan)	D (nm) (Tajriba)
$FeFe_2O_4$	1,8	175,2	8,57 – 32,85	25 – 38

IV.Xulosalar.

$FeFe_2O_4$, nanozarralari kimyoviy kondensatsiya usulidan foydalanib muvaffaqiyatli sintez qilindi. Bu olingan nanozarralarning o’lchami TEM da olingan fotosurati hamda Debay-Sherer tenglamasi yordamida hisoblanganda nanozarralarning diametri 25-38 nm ekanligi aniqlandi. Xona temperaturasida paramagnit tabiatga ega bo‘lgan o‘rganilayotgan namunalardan tog‘-kon sanoatida magnit bo‘lmagan moddalarni ajratib olishda va neft sanoatida oqova suvlarni neft qoldiqlaridan tozalashda, shuningdek, tibbiyot sohasida yangi istiqbolli materiallar sifatida foydalanish mumkinligi taklif etilgan.

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DINIYLIK MUVOZANATINI TA’MINLASHNING ASOSIY SHART VA OMILLARI

Annotatsiya: *Mazkur maqolada jamiyatning g‘oyaviy birlashuvida dunyoviylik va diniylik o‘rtasidagi muvozanatni ta’minlashning nazariy va amaliy jihatlari tahlil qilingan. O‘zbekistonning “Jaholatga qarshi – ma’rifat” tamoyili asosida olib borayotgan siyosati, din va davlat o‘rtasidagi to‘g‘ri munosabatni shakllantirish yo‘llari, shuningdek, diniy ekstremizm va radikalizm xavfini bartaraf etish zarurati yoritib berilgan. Muallif din va dunyoviylik o‘rtasidagi ziddiyatlarni bartaraf etishda o‘zaro bag‘rikenglik va hamkorlik asosida ijtimoiy birdamlikka erishish muhimligini ta’kidlaydi. Islom dinining asl insonparvarlik mohiyatini jamiyatga to‘g‘ri yetkazish orqali g‘oyaviy birlashuvni mustahkamlash zarurati asoslab berilgan.*

Калит сўзлар*: g‘oyaviy birlashuv, diniylik va dunyoviylik muvozanati, diniy bag‘rikenglik, dunyoviy demokratik jamiyat, jamiyatni modernizatsiyalash, jamiyatni demokratlashtirish, vijdon erkinligi, dinlararo bag‘rikenglik.*

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MAIN CONDITIONS AND FACTORS OF ENSURING RELIGIOUS EQUILIBRIUM

Abstract: *This article analyzes the theoretical and practical aspects of ensuring a balance between secularism and religiosity in the ideological unity of society. The policy of Uzbekistan based on the principle of "Enlightenment against ignorance", the ways of forming a correct relationship between religion and the state, as well as the need to eliminate the threat of religious extremism and radicalism are highlighted. The author emphasizes the importance of achieving social solidarity on the basis of mutual tolerance and cooperation in overcoming conflicts between religion and secularism. The need to strengthen ideological unity by correctly conveying the true humanistic essence of Islam to society is substantiated.*

Keywords: *Ideological unity, balance of religiosity and secularism, religious tolerance, secular democratic society, modernization of society, democratization of society, freedom of conscience, interfaith tolerance.*

“O’zbekistonning “Jaholatga qarshi – ma’rifat” degan tamoyil asosida jahon miqyosida tinchlik va osoyishtalikni saqlash, vijdon erkinligi hamda dinlararo bag’rikenglikni ta’minlash, islom dinining insonparvarlik mohiyatini xalqimiz va dunyo ahliga yetkazish borasidagi tashabbuslari xalqaro hamjamiyat tomonidan keng qo’llab-quvvatlanmoqda”. Bugungi kunda jahon taraqqiyotida diniy omil borgan sari o’z kuchini ko’rsatayotir. Nafaqat u yoki bu davlat, balki butun boshli mintaqalarda uning ta’sirida fuqarolar qarama-qarshilik, o’zaro nizo va kelishmovchiliklar girdobiga tortilmoqda, ijtimoiy barqarorlik hamda tinchlik muhiti buzilmoqda. Ushbu ijtimoiy-siyosiy sharoitdan kelib chiqqan holda, demokratiyaning bugungi ta’rifida xalq hokimiyatchiligi bilan bir qatorda diniylik va dunyoviylikning o’zaro munosabatlari to’g’ri yo’lga qo’yilgan ijtimoiy-siyosiy sharoit bilan xarakterlanadi, deyish maqsadga muvofiqdir. Va bugungi kunda jamiyatning g’oyaviy birlashuvchida diniylik va dunyoviylik o’rtasidagi munosabatning qay tarzda shakllanganligi hal qiluvchi ahamiyat kasb etmoqda.

Jamiyatni modernizatsiyalash va demokratlashtirish jarayoni O’zbekistonni ham tubdan o’zgartirdi. Din jamiyat va davlat hayotida muhim omillardan biriga aylanib bormoqda. Yangi ijtimoiy-siyosiy vaziyatda konfessiyalar, diniy yo’nalishlar va ularning izdoshlari soni sezilarli darajada o’sib borayotganligi kuzatilmoqda. Dinga bo’lgan munosabatning o’zgarishi jamiyat ongida sodir bo’lmoqda. Din hamda diniy tashkilotlarning jamiyat hayotidagi tarixiy va dolzarb rolini baholashdagi o’zgarish ularga bo’lgan ishonch darajasi, jamoatchilik fikrida ularning obro’sining oshishiga olib keladi. Bunday o’zaro ishonch va erkin faoliyat yuritish muhiti sharoitida jamiyatda yakdillik, ma’lum taraqqiyot g’oyasiga ishonch, ijtimoiy baraqarorlikka ulush qo’shish hissi ortib boradi.

Jamiyatning g’oyaviy birlashuvida davlat va diniy birlashmalar faoliyatidagi ajratilishlar ayrimachilikni keltirib chiqarmaydi. Dunyoviylik bag’rikeng muloqot madaniyati asosidagi faoliyatlarda bir birini ishlariga aralashmaslik hisoblanadi. Taniqli olim J. Xabermasning fikricha, “davlat jamiyat hayotining turli jabhalarida diniy birlashmalardan ajratilgan bo’ladi va ayni vaqtda ular bilan samarali muloqot hamda hamkorlikni yo’lga qo’yadi. Bu yerda biz ijtimoiy sohada davlat hokimiyatiga va fuqarolarning shaxsiy huquq va erkinliklarini ta’minlashga oid, jamiyatning barcha a’zolari uchun umumiy ma’noga ega bo’lgan masalalar yuzasidan munozara qilish mumkin bo’lgan davlat va nodavlat tashkilotlarini tushunamiz”.

Jamoatchilik muhokamasi umumiy masalalarga daxldor va ijtimoiy-siyosiy maydonda ro’y beradigan muhim tanqidiy bahslardan iborat. Demokratiya bo’yicha ekspertlar so’nggi vaqtlarda olib borayotgan ko’pgina ilmiy tadqiqot ishlarida faqat demokratiyaning umumiy muammolariga emas, balki demokratik jamiyatda dinning tutgan o’rni masalasiga asosiy e’tibor qaratmoqdalar va bu masalalar ilmiy munozaralarda demokratiya tamoyillarining “birlashtiruvchi” yoki “markazlashtiruvchi” modellariga muhim qo’shimcha sifatida birinchi o’ringa chiqmoqda. Lekin, ushbu yondashuv “g’oliblar va mag’lublarni aniqlash mexanizmi”ni topishga xizmat qilishi mumkin, ammo konsessusga erishish, jamoatchilik fikrini shakllantirish yoki etarli darajada kompromisga erishish

mexanizmini ishlab chiqishga hech qanday yordam bermaydi. Shunday ekan, O'zbekistonning yangi taraqqiyot bosqichida jamiyatda g'oyaviy birlashuvni amalga oshirish, milliy birdamlikni shakllantirish uchun diniylik va dunyoviylik o'rtasida maqsadlar birligiga erishish, birlashuvni ta'minlash, mushtaraklikni shakllantirish talab etiladi.

XX asr oxiriga kelib, ma'naviy-madaniy nuqtai nazardan rang-barang musulmon olamining turli qismlarida radikal islomchilarning islomda hokimiyat va dinning yaxlitligi haqidagi azaliy shiorini qat'iy yoqlovchi kuchlar o'ta faollashdi. "Bugungi kunda butun dunyo, ayniqsa, islom hamjamiyati davrning tahlikali tahdidlari bilan yuzma-yuz turibdi. Islom dinini siyosiylashtirish va musulmon yoshlarni radikallashtirish borasidagi urinishlar bunday xatarlarni o'ta jiddiy tahlil qilish, baholash va ularga munosib javob berishni taqozo etmoqda". Mana shunday jarayonlar ayrim musulmon mamlakatlarida boshboshdoqlik, diniy ayirmachilik va parokandalikni kuchaytirib yubormoqda, bu esa jamiyatlarning ijtimoiy-iqtisodiy barqarorligini tahdid ostida qoldirmoqda. Islomning siyosiylashtirilishi ham jamiyatda g'oyaviy birlashuvni murakkablashtirib, maqsadlar ayroligini vujudga keltirmoqda. Shuningdek, musulmon yoshlarining radikalshashuvi natijasida dunyoviylikni inkor qilinishi bilan birga, boshqa tomondan islomofobiyani keltirib chiqarmoqda. Bunday sharoitda jamiyatda g'oyaviy birlashuvna amalga oshirish imkonsiz bo'lib qolmoqda. Shu bois islom mintaqalarida islomni siyosiylashtirmasdan, uning ezgu g'oyalari, insonlarni birlashtiruvchilik funksiyalari asosida birdamlikni, g'oyaviy birlashuvni amalga oshirish zarurati ortib bormoqda.

Barcha demokratik davlatlarda insonning qaysi dinda bo'lishidan qat'iy nazar, o'z dini, e'tiqodi, urf-odatlari, fikrlari hamda so'z erkinligiga tajovuzsiz yashashini himoya qiluvchi qonunlar mavjud. Islom dinining muqaddas kitobi bo'lmish "Qur'oni Karim"da ham "Dinda majbur qilish yo'q" ("Baqara" surasi, 256- oyat), "Sizlarga o'zlaringizni diningiz, Menga o'zimning dinim" ("Kofirun" surasi, 6- oyat), "Alloh bizning robbimizdir va sizlarning ham robbingizdir. Bizning amallarimiz o'zimiz uchun, sizlarning amallaringiz o'zlaringiz uchundir" ("Sho'ro" surasi, 15- oyat), "Eslat. Albatta, Sen eslatuvchisan, ular ustidan zo'ravon emassan" ("G'oshiya" surasi, 21–22-oyatlar), "Ularning ishlari o'zaro sho'ro-maslahatdir" ("Sho'ro" surasi, 38- oyat) degan oyatlari bilan 1400 yil avval demokratiya asoslari bayon qilingan.

Aksar reaksion hizblar va oqimlarning demokratiya asoslarini Qur'on, shariat hamda islom asoslariga muvofiq yoki yo'qligini analiz qila olmay ko'r-ko'rona qarshi chiqishlari, "demokratiya" so'zining o'zidan talvasaga tushib qolishlari, kaltabinlik va mutaassiblikdan boshqa narsa emas. Ular o'z da'volarida G'arb demokratiyasidagi islom qonunlariga zid ba'zi g'ayriinsoniy buzuqliklarga bo'lgan ruxsatlarni ro'kach qiladilar. Albatta, bunday g'ayriinsoniy buzuqliklarga ruxsat berilishiga qarshi turish kerak va bunday holatlarga o'sha G'arb davlatlarining hammasida ham ruxsat berilgan emas, balki qonunan man etilgandir. Binobarin, demokratiya dushmanlarining G'arbdagi ba'zi salbiy holatlar va kamchiliklarni ro'kach qilib, demokratiyaning Islom diniga zid ekanligini da'vo qilishlari mutlaqo

asossizdir. Bu esa, jamiyatda g'oyaviy birdamlikka rahna solmoqda, parokandalik va boshboshdoqlikni keltirib chiqarmoqda. Shuning uchun ham demokratik prinsiplar asosida diniy g'oyalar va dunyoviy g'oyalarni uyg'unlashtirish, jamiyatning dunyoviy hamda diniy ehtiyojlarini qondirishlari uchun teng imkoniyatlar yaratish, faoliyatda mushtaraklikni yaratish dolzarb vazifalardan birigsha aylanmoqda.

Musulmonlar yurti bo'lgan Afg'oniston dunyoning yarmiga narkotik etkazib berayotgani uchun butkul islom dini va barcha musulmonlarni ayblash to'g'ri bo'lmaganiday, geopolitik manfaatlarini amalga oshirish maqsadida "demokratiya eksporti" bilan shug'ullanuvchi va uni daromad manbaiga aylantirib olgan bir guruh qora kuchlarning siyosiy o'yinlari sabab butkul demokratiyani ayblash noto'g'ri. Faqat, o'zaro hurmat asosida tushuntirish, maslahat, munozara va muhokama hamda bag'rikenglik tamoyillarigina kutilgan yaxshi, samarali natijalar berishi rivojlangan davlatlar tajribalarida ham yaqqol ko'rinib turibdi. Afsuski, hozirgi o'qitilayotgan ba'zi mavjud islomiy ta'limotlarda insonning aqlini, tushunchasini, ixtiyorini hurmat qilish emas, zo'ravonlik tushunchasiga asosiy e'tibor qaratilmoqda. Ba'zi oqimlar muvaffaqiyatli davlat tizimini yaratish kaliti faqat islomiy davlat qurish, majburiy tarzda islom hukmlarini joriy etishda, deb hisoblaydilar. "Biz butun jahon jamoatchiligiga islom dinining asl insonparvarlik mohiyatini etkazishni eng muhim vazifa, deb hisoblaymiz". Shu maqsaddda ham jamiyatda g'oyaviy birlashuvni amalga oshirish va birdamlikni shakllantirish, islomning birlashishga chorlovchi g'oyalaridan demokratik boshqaruv jarayonlarida ham foydalanish imkoniyatlarini topish talab etilmoqda.

Ma'lumki, "musulmon dunyosi taraqqiyotida ulkan rol o'ynagan xalqimiz mentalitetining asosini tom ma'noda bag'rikenglik, olijanoblik va ezgulik kabi fazilatlar tashkil etadi". Bugungi kunda "dunyoviylik" va "diniylik" tushunchalari hamda ularning ijtimoiy-falsafiy mazmunini tahlil qilish o'ta dolzarb ijtimoiy-gumanitar muammolardan biri hisoblanadi. Ta'kidlash joizki, dunyoviylik va diniylik tushunchalari qadimdan ko'pgina olimlar, mutafakkirlar va diniy ulamolar tomonidan bir-birini inkor etuvchi hamda qarama-qarshi tushuncha va aspektlar sifatida o'rganildi, bir-biriga zid ikki tamoyil sifatida anglab kelindi.

Din abadiy va haqiqiy dunyo sifatida g'ayritabiiy dunyoni e'tirof etadi va insonning real dunyodagi hayotini abadiy dunyoga o'tish yo'lida bir vosita deb o'rgatadi. Dunyoviylik esa ob'yekt sifatida moddiy olamni o'rganish va o'zgartirishga harakat qiladi. Tadqiqotchi olim T. Karimning fikriga ko'ra, kishilarning dunyoga munosabatlari mazmunan to'rt xilda namoyon bo'ladi: 1) diniy mutaassiblik; 2) diniy bag'rikenglik; 3) dunyoviylik; 4) dahriylik. Masalan, jamiyatda diniy mutaassiblik hukmron bo'lganida, har qanday dunyoviy tamoyillar inkor etiladi. SHu bilan birga, dahriylik ham dinni jamiyat uchun afyun deb hisoblashini boshimizdan o'tkazdik. Dunyoviy demokratik qadriyat va tamoyillarga asoslangan jamiyatlarda bag'rikenglikning har qanday shakli, jumladan diniy bag'rikenglik ham muhim qadriyat sifatida ta'minlanadi. Shu bois jamiyatning g'oyaviy birlashuvida diniy va dunyoviy bag'rikenglik tamoyillari ustuvorligini ta'minlash, g'oyaviy

birlashuvda diniylik va dunyoviylik pozitsiyalariga toqatli munosabatni shakllantirish juda muhim ekanligi kelib chiqmoqda.

Shuningdek, jamiyatning g'oyaviy birlashuvida islomning demokratik tamoyillarini dunyoviylik bilan bog'lash ham zaruriy vazifalardan biriga aylanmoqda. Hozirgi vaqtda "Islom demokratiyasi" tushunchasi ham ma'lum bir g'oya sifatida mafkura maydoniga chiqmoqda. Lekin, ushbu g'oya tom ma'noda to'liq dunyoviy xarakter kasb eta olmaydi. Ushbu model diniy mazmunga ega bo'lib, butun insoniyatning mushtarak manfaatlarini qamrab ololmaydi. Hozirgi paytda musulmon mamlakatlarida tarqalayotgan din niqobidagi ekstremistik va fundamentalistik qarashlarning ko'rinishlari turlicha bo'lib, mohiyatan bir xillikni tashkil etadigan qarashlardan tarkib topadi. Ya'ni, "Bir mohiyat ko'pgina mazmunlarda namoyon bo'ladi, lekin mazmun ikki yoki undan ortiq mohiyatlarda namoyon bo'lishi mumkin emas", degan falsafiy qoidani yana bir bor tasdiqlab kelmoqda. Bunda mohiyat har qanday diniy ekstremistik va fundamentalistik qarashlarning ko'rinishlari turlicha bo'lib, mohiyatan bir xillikni tashkil etadigan qarashlardan tarkib topadi. Biroq bugungi kunda ijtimoimy beqarorlikni keltirib chiqarishda asosiy kuchlardan bo'lgan ekstremistik va fundamentalistik qarashlar ham jamiyatlarda g'oyaviy birlashuviga to'siq bo'lib kelmoqda.

Dunyoviy ideologiya asosida birlashuvga qaratilgan demokratik taraqqiyot yo'lining o'ziga xosligi shundaki, dinni jamiyat hayotidan siqib chiqarishni emas, balki dinni jamiyat hayotining ajralmas qismi sifatida qabul qilib, ijtimoiy taraqqiyotga xizmat qiladigan omil sifatida tushuntirishga harakat qiladilar. Dunyoviy davlatda davlatning din va diniy tashkilotlardan mustaqil ekanligi, qaysidir din yoki mafkuraning majburiyat sifatida o'rnatilmaganligi, ma'lum bir din yoki mafkura ta'sirida hukmron tizimning vujudga kelishiga yo'l qo'yilmasligi alohida xususiyatdir. Ushbu savolga aniq javob berish uchun dunyoviy davlatning o'ziga xos belgilarini tahlil etishga to'g'ri keladi.

Bugungi kunda ilmiy adabiyotlarni o'rganish natijasida dunyoviy demokratik davlatning asosiy paradigmalari sifatida quyidagilarni keltirish mumkin:

- davlatning diniy va mafkuraviy manbalardan mustaqil ekanligining qonun asosida mustahkamlanganligi;
- har qanday diniy mafkuraning davlat boshqaruvining mutlaq suverenetitetiga qarshi qo'yilishiga yo'l qo'yilmasligi;
- mafkurani targ'ib qilishga yo'naltirilgan diniy birlashmalarning davlatdan ajratilganligi;
- majburiy din yoki mafkuraning yo'qligi;
- diniy tashkilotlarning erkin faoliyat yuritishi uchun qonuniy sharoit yaratilganligi;
- diniy birlashmalarning qonun oldida tengligi;
- davlat ta'lim tizimining dunyoviy xarakterga ega ekanligi;
- din yoki mafkuraning majburan o'rnatilishiga yo'l qo'yilmasligi. Mana shunday majburiylikka emas, ihtiyor erkinligiga, ongli tanlovga asoslangan dunyoviylik va diniylik jamiyatda birdamlikni, hamjihatlikni shakllantiradi.

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JAMIYATNI G’OYAVIY BIRLASHUVIDA “MILLIY TIKLANISHDAN – MILLIY YUKSALISH SARI” TAMOYILINING O’RNI

Annotatsiya: *Ushbu maqolada jamiyatning g'oyaviy birlashuvida “Milliy tiklanishdan – milliy yuksalish sari” tamoyilining o'rni va ahamiyati tahlil qilingan. Muallif O'zbekistonda amalga oshirilayotgan ijtimoiy, iqtisodiy va siyosiy islohotlar, ularning g'oyaviy asoslari hamda milliy yuksalishga xizmat qiluvchi ijtimoiy birdamlik zarurligini asoslab beradi. Shuningdek, maqolada jamiyatni yangilash jarayonida an'analar va zamonaviy yondashuvlar o'rtasidagi muvozanatni topish, fuqarolik jamiyatini rivojlantirish, yoshlarni fidoyilik va vatanparvarlik ruhida tarbiyalash zarurati yoritib berilgan. Milliy tiklanish va milliy yuksalish konsepsiyasining jamiyat birlashuvidagi strategik o‘rni chuqur tahlil qilingan.*

Kalit so‘zlar: *G‘oyaviy birlashuv, milliy tiklanish, milliy yuksalish, ijtimoiy birdamlik, fuqarolik jamiyati, ijtimoiy-siyosiy islohotlar, innovatsion rivojlanish, an’analar va zamonaviylik muvozanati, yoshlar tarbiyasi, fidoyilik va vatanparvarlik, milliy taraqqiyot*

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THE ROLE OF THE PRINCIPLE "FROM NATIONAL RENAISSANCE TO NATIONAL RISE" IN THE IDEOLOGICAL UNITING OF SOCIETY

Abstract: *This article examines the role and significance of the principle "From National Revival to National Progress" in the ideological unification of society. The author substantiates the necessity of social solidarity and ideological unity for achieving national progress in the context of the ongoing social, economic, and political reforms in Uzbekistan. The article also emphasizes the importance of finding a balance between traditions and modern approaches, developing civil society, and educating young people in the spirit of patriotism, loyalty, and morality. Attention is paid to the strategic significance of the concept of national revival and national progress in the process of social unity.*

***Keywords*:** *Ideological unity, national revival, national rise, social solidarity, civil society, socio-political reforms, innovative development, balance of traditions and modernity, youth education, dedication and patriotism, national development*

O'zbekiston taraqqiyotining yangi bosqichida jamiyatni birlashtiruvchi yangi g'oyaga ehtij ortib bormoqda. Ma'lumki, jamiyatlar taraqqiyoti unda yashovchi insonlarning ma'lum maqsad asosida birlashuvi va bu maqsadni amalga oshirish uchun barcha kuchlarni safarbar etilishi bilan bog'liq bo'lgan. Bugungi kunda jamiyatimizning g'oyaviy birlashuvi va oliy maqsad sari birgalikda harakat qilishi yuksak natijalarni belgilab beradi. Jamiyatimizda yashovchi millati, dini, irqi va ijtimoiy kelib chiqishidan qat'i nazar har bir inson jamiyatning umumiy oliy maqsadi uchun mas'uliyatni his qilishi, unga nimadur bilan hissa qo'sha olishi talab etiladi. Shu bois jamiyatimizda davlat siyosati darajasiga ko'tarilmagan, mafkuralashtirilmagan va siyosiy qurolga aylanmagan, shunchaki, jamiyatni birlashtiruvchi, ma'lum maqsad sari yo'naltiruvchi, barchani ehtiyoj va manfaatlarini inobatga oluvchi aniq, real va hayotiy birlashtiruvchi g'oyaga ehtiyoj paydo bo'lmoqda.

Jamiyat hayotida shunday davrlar bo'ladiki, o'z umrini yashab bo'lgan eski tuzum qonun-qoidalarini yangicha asosda o'zgartirish, barcha sohalarda keng ko'lamli islohotlarni amalga oshirish zarurati eng muhim ehtiyoj, kerak bo'lsa, hayot-mamot masalasi sifatida kun tartibiga chiqadi. Bugun jamiyatimizda ham olib borilayotgan islohotlar muhitida, innovatsion o'zgarishlarga mos ravishda ijtimoiy birlashuv g'oyasiga zarart vujudga keldi. O'zgarishlar jarayonida xalqning ehtiyoj va manfaatlari, xoxish va istaklarini qamrab olgan va ularni birlashtirgan, yagona maqsad sari yo'naltirgan va yuksak marralarni zabt etuishga safarbar etuvchi kuch orqali fidoyi, sadoqatli, vatanparvar va mehnatsevar insonlar birlashmasni shakllantirish ustuvor vazifaga aylandi. Zero, "jamiyatimizda aholi, ayniqsa, yosh yigi-qizlarimizning ma'naviy va ma'rifiy saviyasini doimiy yuksaltirish – birinchi darajali ahamiyatga egadir. Shu bois, "Milliy tiklanishdan – milliy yuksalish sari" degan dasturiy g'oya asosida, yoshlarni ona yurtga sadoqat ruhida tarbiyalash, ularda tashabbuskorlik, fidoyilik, axloqiy fazilatlarni shakllantirish – o'ta sharafli vazifadir"[1]. Shunday ekan, jamiyatda g'oyaviy birlashiuvni shakllantirish va iqtisodiy barqarorlikka erishish dolzarb vazifalardan biridir. Buning uchun davlatimiz rahbari tomonidan ilgari surilgan "Milliy tiklanishdan – milliy yuksalish sari" degan dasturiy g'oya atrofiga birlashish, hamjihat bo'lish iqtisodiy rivojlanishni belgilab beradi.

Mazkur jarayonda ortodoksal qarashlar, an'analar va qadriyatlarni yangilash, ularni modernipzatsiya qilish talab etiladi. Turli manfaat va qiziqishlarga asoslangan, transformatsiya jarayonlarini tabiiy hol sifatida qabul qiladigan jamiyat o'ziga tanqidiy nazar bilan qarashga, yo'l qo'yilgan xatolarni to'g'rilashga moyil bo'ladi. Mutlaq ortodoksal va mutlaq noortodoksal jamiyat yo'q, har bir tizimda ularni, muayyan darajada, uchratish, kuzatish mumkin. Jamiyatdagi yangilanish,

[1] Мирзиёев Ш. М. Миллий тикланишдан – миллий юксалиш сари… –Б. 35.

innovatsion rivojlanish ortodoksal yondashishlardan, an’analardan voz kechishni, mavjud kamchiliklarni ochiq tan olib ularni to’g’rilashni, ijtimoiy munosabatlarni yangi transformatsiya bosqichiga ko’tarishni taqozo etadi. Bu o’rinda yangilik bilan eskilik, novator bilan retrograd o’rtasida bahs, tortishuv va kurash ketishi tabiiy holdir.

Milliy tiklanish, taraqqiyot va yuksalish juda keng, chuqur, murakkab tarixiy jarayon bo’lib, u millatimiz hayotining hamma sohalarni:iqtisodiyotni ham, siyosiy faoliyatni ham, ma’naviyatni ham, ilm-fan, til, tarix, urf-odatlar, hunarmandchilik, me’morchilikni ham, inson kamoloti bilan bevosita daxldor barcha masalarni o’z ichiga qamrab oladi. Milliy tiklanishga birdaniga erishib bo’lmaydi, u uzoq davom etadigan, ko’p yillarni o’z ichiga qamrab oladigan murakkab davrdir. Zero, “ ushbu davrda to’plagan tajribamiz bir haqiqatni yaqqol isbotlab bermoqda: taraqqiyotga – faqat mashaqqatli va jasoratli mehnat orqali erishiladi**.** Shu bois, pandemiya, dunyodagi chuqur iqtisodiy va siyosiy inqirozlar, ziddiyatlarga qaramasdan, xalqimizning qahramonlarcha mehnati bilan erishgan ayrim yutuqlarimizni aytib o’tishni o’rinli”[2], deb bilaman.

Fuqarolik jamiyatini barpo etish borasida mamlakatimizda amalga oshirilayotgan tub islohotlar xalqimizning milliy o’zligini anglashga bo’lgan intilishlarini rag’batlantirmoqda. Shu ma’noda, milliy taraqqiyot va ma’naviy yuksalish jarayoniga ta’sir etuvchi ob’yektiv shart-sharotlar hamda sub’yektiv omillarni ilmiy asosda o’rganish masalasi bugungi kunda tadqiqotchilarning oldida turgan muhim vazifalardan biridir.

Zamonaviylik hech qachon o’zidan o’zi, osonlik bilan real voqelikka aylanmagan, ijtimoiy hayotning o’zgaruvchan, dinamik xususiyati esa yangilikni keskinroq, shiddatliroq, hatto, ma’lum guruhlar manfaati va istaklariga zid tarzda faolroq bo’lishga undaydi. Zamonaviylik va innovatsiyaning bunday faolligi zararli emas, ammo ularning ijtimoiy-tarixiy imkoniyatni qo’ldan boy berib, nofaolligi, xotirjamlikka, o’zini o’zi ulug’lashga berilishi jamiyatga qimmatga tushadi.

O’zbekistonda milliy taraqqiyotning yangi bosqichi Sh. M. Mirziyoyev nomi bilan bog’liqdir. Sh. M. Mirziyoyev o’tgan o’n yilliklarni tanqidiy tahlil qilish, shu asosda jamiyat hayotini yangilash konsepsiyasini taklif etdi. Sotsiolog V. Pareto to’g’ri qayd etganidek: “Jamiyatning bir holatdan boshqa holatga o’tishi birdan ro’y bermaydi. Bunda jonli mavjudotlarning evolyusion rivojlanish jarayonlariga monand uzoq davom etadigan o’zgarishlar kechadi”[3]. Davlatimiz rahbari 2016-yil 8- sentabrda O’zbekiston Respublikasi Oliy Majlis Qonunchilik palatasi va Senatining qo’shma majlisidagi nutqida Birinchi Prezident boshlab bergan islohotlarni “qat’iyat bilan davom ettirish”ga ahd qilgani ko’zga tashlanadi. Shuningdek, islohotlarni yangi bosqichga olib chiqish, iqtisodiy taraqqiyotga erishish, jamiyatda birlik va hamjihatlikni shakllantirish, mamlakatni rivojlangan

[2] Ўзбекистон Республикаси Президенти Шавкат Мирзиёевнинг 2023 йил учун Мурожаатномаси // https: // review.uz/oz/post/ozbekiston-respublikasi-prezidenti-shavkat-mirziyoyevning-2023-yil-uchun-murojaatnomasi-toliq-matn.

[3] Парето В. Трансформация демократии / Западно европейская социология XIX – начала XX веков. – Москва: Изд. Международного Университета Бизнеса и Управления, 1996. – С. 155.

davlatlar qatoriga qo’shish, jamiyatni zamonaviylashtirish, so’z erkinligi va inson huquqlarini oliy qadriyat darajasiga ko’tarishn ham maqsad qilganligi ham e’tirofga sazovordir.

So’nggi yillarda ko’plab islohotlar amalga oshirildi, tom ma’noda o’zgarishlar, yangilanishlar boshlandi. Buni xalqaro maydonda rivojlangan davlatlar tomonidan e’tirof etilayotganligidan ham bilsa bo’ladi. Biroq, jamiyatda ijtimoiy-iqtisodiy va siyosiy o’zgarishlar hamda islohotlarni amalga oshirish bilan birga ma’naviy-ma’rifiy sohada ham, mafkuraviy jihatdan ham yangiliklar, o’zgarishlarni amalga oshirish kerak edi. Chunki, hech bir mafkura abadiy emas, har bir mafkurani umri, yo’lining oxiri bo’lgani kabi, eski milliy g’oyamizning ham ta’sir kamayib borayotgan edi. Bunday jarayonda davlatimiz rahbari tomonidan milliy tiklanishdan milliy yuksalish tomon borayotganligishizni o’zida jamlagan yangi ideologik ta’sir mexanizmlarini ishlab chiqish taklifini ilgari surildi. Natijada ijtimoiy birlashuvga qaratilgan, jamiyatni g’oyaviy birlashtirishni maqsad qilgan yangi milliy yuksalish konsepsiyasi ishlab chiqildi. Zero, “bu borada mamlakatimiz fuqarolarining huquq va erkinliklarini, O’zbekiston Respublikasining Konstitutsiyasi va qonunlariga rioya etilishini ta’minlashni, O’zbekiston Respublikasining suvereniteti, xavfsizligi va hududiy yaxlitligini muhofaza etish yuzasidan zarur chora-tadbirlar ko’rishni, Respublika oliy hokimiyat va boshqaruv organlarining bahamjihat ishlashini ta’minlashni, yaqin va uzoq qo’shni davlatlar bilan o’zaro manfaatli hamkorlik aloqalarini rivojlantirishni eng asosiy vazifa deb hisoblayman”[4].

Yuqoridagi so’zlarda Prezidentning mustaqil rivojlanish yo’liga sodiq ekani, o’tgan yillarda boshlangan islohotlarni davom ettirishni niyat qilib qo’ygani namoyon bo’ladi. Ammo davlatimiz rahbari ob’yektiv va sub’yektiv sabablar bois hal qilinmay kelgan muammolarni tanqidiy tahlil qilish orqali milliy taraqqiyotni yangi bosqichga ko’tarishni maqsad qildi va o’zining har bir murojaatida xalqni birlashish va hamjihat bo’lmish, ijtimoiy birdamlikka ugndadi. Uning barcha sa’y-harakatlarida, e’lon qilinayotgan Farmonlari va Qarorlarida ushbu yondashuv yaqqol ko’rinadi. O’tgan o’n yilliklarda shakllangan to’rachilik, xalqdan uzoqlashish, amaldorlarning o’z huzur-halovati uchun yashashi, poraxo’rlik, korrupsiya, kvaziskorxonalar va birlashmalar tashkil etish, davlat mablag’larini o’marish, “Men senga tegmayman, sen menga tegma” tarzida ishlash, dabdababozlik, sanoxonlik, laganbardorlik kabi demokratik jamiyatga muvofiq kelmaydigan, g’ayriqonuniy odatlar keskin tanqid ostiga olindi. Bunday odatlar hayotda aniq ko’zga tashlanayotgan bo’lsa-da, lekin yillar davomida ularni tag-tomiri bilan yo’q qilish mexanizmlari yaratilmadi. Jamiyatda milliy yuksalish jarayonini boshlab berish bilan birga, so’z erkinligini himoya qilinishi va davlat tomonidan inson huquqlarini kafolatlanishi bilan jamiyatda jamoatchilik nazorati ham kuchayib, real kuchga aylanib bordi. Bu ham jamiyatning ijtimoiy birlashuvining muhim asosiga aylandi.

[4] Мирзиёев Ш. М. Миллий тараққиёт йўлимизни қатъият билан давом эттириб, янги босқичга кўтарамиз.… – Б. 21.

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O'simliklar karantini va himoyasi bo'yicha tadqiqotlar
Katta ilmiy xodim
Institutning Farg‘ona viloyat filiali

G‘ALLANING SO‘RUVCHI ZARARKUNANDALARINING BIOEKOLOGIK XUSUSIYATLARI

Annotatsiya: *Ushbu maqolada oddiy g‘alla shirasi hamda katta g‘alla shirasi biokologik hususiyatlari keltirilib o’tilgan. G’alla-don yetishtirishda uchrovchi hashoratlarning zarari va ularga qarshi kurashda tavsiyalar berilgan*

Kalit so‘z: *Boshoqli don, xarorat, oddiy g‘alla shirasi, katta g‘alla shirasi, tuxum, yetuk zot.*

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BIOECOLOGICAL PROPERTIES OF SUPPRESSION PEST OF GRAIN

Abstract: *This article presents the biological characteristics of common and large wheat aphids. Recommendations have been given on the harmfulness of insects encountered in grain cultivation and how to combat them.*

Keywords: *Cereal grain, temperature, ordinary grain juice, large grain juice, egg, mature breed*

Oddiy g‘alla shirasi boshoqli don ekinlariga zarar keltirib yashovchi va migratsiya hosil qilmaydigan (boshqa turdagi o‘simliklarga ko‘chmaydigan) shiralarning biridir. Bu shiralarning qanotsiz urg‘ochi zotlari yaltiroq, oqish yashil rangda bo‘ladi. Tanasining orqa qismida to‘q yashil chiziqlari bor, bu turdagi shiralar respublikamizning barcha g‘allazorlarida uchraydi. Shiralarning ochiq dalada qishki diapauzadan chiqib zarar keltira boshlash muddatini aniqlash uchun yil davomida kuzatuvlar olib bordik. Kuzatuvlarimiz davomida o‘rtacha kunlik havo harorati 7-8° S bo‘lganda bug‘doyzorlarda shiralarning qishki diapauzadan chiqqan lichinkalari ko‘rina boshladi. Harorat ko‘tarilishi bilan bu zararkunandaning partenogenetik ko‘payishi kuzatildi. Oddiy g‘alla shirasining qishki diapauzaga ketgan tuxumlarining embrional rivojlanishini o‘rganish uchun Ye.Radchenko (1991) uslubi asosida kuzda yig‘ib kelingan qishlovga ketgan shira tuxumlarini termostatlarga qo‘yib, ulardan necha kunda lichinka chiqishini aniqlanadi.

Katta g‘alla shirasi - *Sitobion avenae F.*Katta g‘alla shirasi respublikamizning barcha sug‘oriladigan g‘alla ekiladigan maydonlarida uchraydi. Bu hasharotning yetuk zoti 2,5-3,5 mm. kattalikda bo‘ladi. Rangi yaltiroq sarg‘ish-yashil rangda

qorin qismida sariq dog‘lari bor. Tadqiqotlarimiz davomida katta g‘alla shirasi asosan bug‘doy va arpa boshoqlarida, bayroqcha barglarida, ayrim hollarda esa o‘simlik poyasi va barglarida joylashib hayot kechirishini kuzatdik. Bu turdagi shiralarning yog‘ingarchilik ko‘p bo‘lgan yillarda bug‘doy boshoqlarining qiltiqlarida joylashib oziqlanishini, yog‘ingarchilik kam bo‘lgan yillari boshoqlarda hattoki gullarining ichiga kirib olib o‘simlik tanasidan suyuqligini so‘rib oziqlanishini kuzatdik. Natijada don hosil bo‘luvchi to‘qimalar nobud bo‘lib, hosildorlikka katta zarar yetkazishi tadqiqotlar va kuzatuvlar asosida aniqlandi.Katta g‘alla shirasining bir yilda necha avlod berib rivojlanishini va urg‘ochi zotlarining qancha pusht berishini aniqlash uchun izlanishlar olib bordik. Ma’lumotlardan ko‘rinib turibdiki, katta g‘alla shirasining qishlab chiqqan partenogenetik imagolari qulay sharoitga tushgach 3-5 kun qo‘shimcha oziqlanib, tirik lichinka tug‘ib ko‘paya boshlaydi. Tajribalarimiz natijalari shuni ko‘rsatdiki, bir dona qishlab chiqqan katta g‘alla shirasi tabiatda o‘rtacha 29,3 kungacha yashab, shu vaqt ichida 9-10 tagacha lichinka tug‘ishi mumkin. Havo harorati o‘rtacha 5-10° S bo‘lganda shiralarning lichinkalik davri 14-16 kungacha davom etdi.Zararkunandalarga qarshi kimyoviy usul bilan kurashish uchun o‘simlik shiralariga qarshi tavsiya etilgan preparatlar qo‘llaniladi. Buning uchun O‘zbekistonda qabul qilingan iqtisodiy zarar miqdor mezoni bo‘lib quyidagi zararlangan poyada trips yetuk zoti 8-10 ta va undan ko‘p bo‘lsa. Kuzgi bug‘doy boshoqlari 15-20 ta, baxorgi bug‘doyda esa 30-40 lichinka va yetuk zoti mavjudligi kimyoviy kurash o‘tkazish kerakligini ko‘rsatadi. Sug‘oriladigan g‘alla agrobiotsenozida boshoqli don ekinlari shiralarining tabiiy kushandalaridan koksinellidlar, sirfid pashshalari va oltinko‘zlar dominant tur sifatida ko‘p uchrab, bitta lichinkasi bir kun davomida 35 tadan 250 tagacha shiralarni yakson qiladi. Boshoqli don ekinlarida shiralar dala bo‘ylab yoppasiga tarqalganda va ularning soni IZMga yetganda quyidagi kimyoviy praparatlarning birortasi bilan ishlov o‘tkazish tavsiya etiladi: kinmeks, 5 % e.k. (0,2 l/ga); fyuri, 10 % e.k.(0,3 l/ga); sipermetrin, 25 % e.k. (0,3 l/ga); sumi-alfa, 5 % e.k. (0,3 l/ga); buldok, 2,5 % e.k. (0,5 l/ga); siperfos, 55% e.k. (0,5 l/ga); talstar, 10 % e.k. (0,5 l/ga); nurell-D, 55 % e.k. (1,2 l/ga); deltafos, 36 % e.k. (1,2 l/ga); karbofos, 50 % e.k.(1,5 l/ga).

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DEMAND TRENDS FOR HEALTH AND SOCIAL SERVICES IN ANDIJAN REGION

Abstract: *The article examines the demand for medical and social services in the Andijan region, the spread of diseases in the region and their causes, as well as measures taken to combat diseases.*

Keywords: *Healthcare, Andijan region, hospital, service, infectious and non-communicable diseases, diagnostics, diabetes, cancer, tuberculosis.*

Introduction. Number of enterprises in the field of health care and social services As of April 1, 2023, the number of registered enterprises and organizations in the field of health care and social services was 12,368, with a growth rate of 171.7% compared to the corresponding period in 2019. As of October 1, 2023, the number of operating enterprises was 10,873, and their distribution by region is as follows *figure 1.* The volume of healthcare services As of January-August 2023, the volume of healthcare services amounted to 5,298.7 billion soums, an increase of 105.6% compared to the same period last year.

The share of this type of service in the total volume of market services provided was 1.8%. As of January-July 2023, the volume of healthcare services amounted to 2,098.3 billion soums, or 2.1% of the total volume of market services provided. Measures aimed at developing healthcare infrastructure In 2023, the number of enterprises and organizations registered in the field of healthcare and social services amounted to 12,368, with a growth rate of 171.7% compared to the corresponding period of 2019.

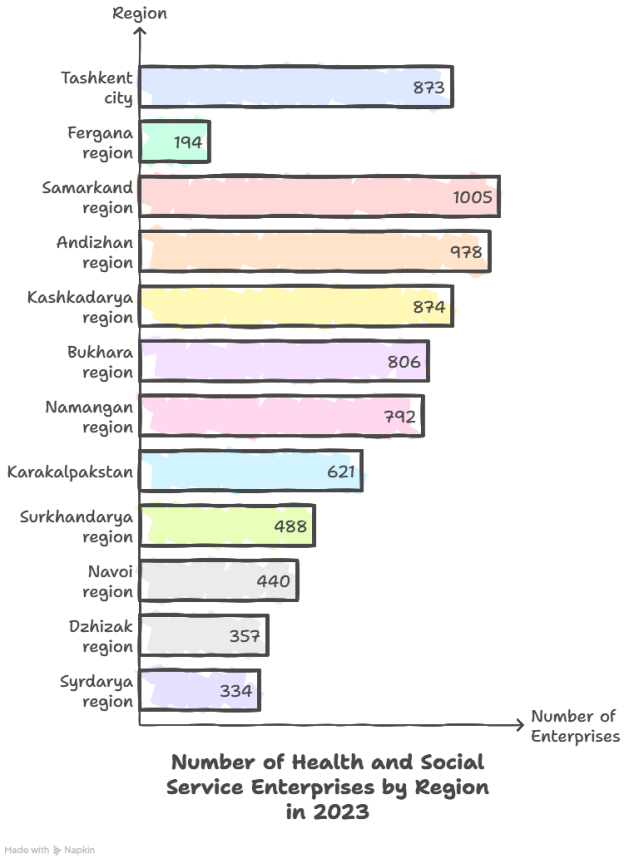

Figure 1. ***The Ministry of health was prepared on the basis of Statistics.***

As of October 1, 2023, the number of operating enterprises is 10,873, and their distribution by region is as follows: Tashkent city: 2,087, Fergana region: 1,194, Samarkand region: 1,005, Andijan region: 978, Tashkent region: 874 Kashkadarya region: 806 Bukhara region: 792 Namangan region: 706, Khorezm region: 621, Republic of Karakalpakstan: 488, Surkhandarya region: 440, Navoi region: 357, Jizzakh region: 334, Syrdarya region: 191. The economic situation of the region and the development of health infrastructure affect the health of the population. The development of industry and agriculture increases environmental threats, and the efficiency of health infrastructure plays an important role.

Main part. The number of hospital institutions operating in Andijan region has increased from 92 in 2010 to 179 today. In particular, the number of hospital institutions operating in Andijan city increased from 43 in 2010 to 70 by 2023, while the number of hospital institutions operating in Khanabad city increased from 2 in 2010 to 5 by 2023.

The following factors affect the ecological situation in the region. Air pollution is observed as a result of industrialization, the development of industries such as textile and machine building in the region. The use of pesticides and mineral fertilizers in the cultivation of cotton and other agricultural products leads to pollution of soil and water resources. The main types of diseases in the region and their geographical distribution In 2022, a total of 2,328.7 thousand diseases were registered in outpatient clinics of Andijan

region. Of these, 18 and older: 64.0%, 15–17 years old: 7.8%, 14 years old: 28.2%, The main types of diseases are infectious diseases, intestinal infections, respiratory diseases.(Fig.2.)

Adverse events, allergic reactions, toxic reactions. Geographical distribution of social diseases: drug addiction, alcoholism Infectious and social diseases are more common in urban areas. Respiratory diseases and allergic reactions are more common in rural areas. Regional analysis of diseases in the region was carried out on the basis of statistical data, in this process special attention is paid to the analysis of high disease rates and health infrastructure in the regions. Despite the above-mentioned effective activities to protect the health of the population, a number of issues in the region require expert attention.

In particular, the main diseases prevalent in Andijan region are malaria - common in tropical and subequatorial climate regions. Intestinal infections - due to poor sanitation and contaminated water. Cardiovascular diseases - due to social factors and low physical activity. Major diseases, such as cardiovascular diseases, hypertension, and ischemic heart disease, are widespread in the region. Diseases such as upper respiratory tract diseases, bronchitis, and asthma are related to inflammation of the respiratory tract.

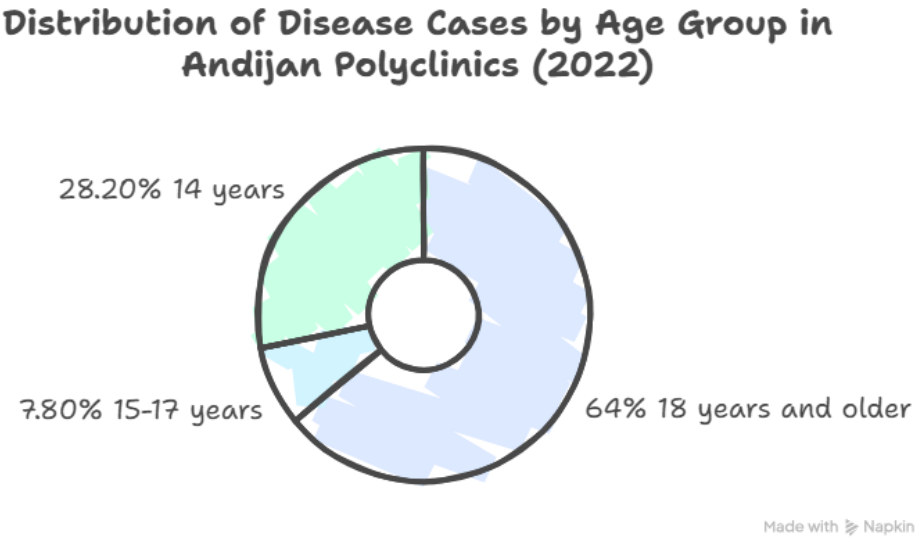

Figure 2. ***The Ministry of health was prepared on the basis of Statistics.***

Diabetes mellitus, a metabolic disease, is widespread in the region. Infectious diseases such as tuberculosis and hepatitis are highly prevalent in some districts. Congenital and hereditary diseases are highly prevalent in some districts due to genetic factors. Among the common diseases among children, diseases such as pneumonia, anemia, and dysbacteriosis are widespread. Andijan city has a high incidence of cardiovascular diseases and diabetes. Asaka, Khanabad

districts: Respiratory diseases are highly prevalent due to industrial waste. In Bulaqbashi and Shahrikhan districts have a relatively high incidence of infectious diseases in rural areas. In Kurgan-tepa and Pakhtaabad districts have a high incidence of tuberculosis and hepatitis. About the prevalence of some major diseases (infectious and non-infectious) in Andijan region by district: Infectious diseases HIV (AIDS) Andijan city has a high incidence of HIV in the city. Due to the high population density and very active social migration, the risk of disease spread increases. Asaka district has a lot of industrial and labor migration, therefore, expanded testing and prevention work is being carried out to prevent the spread of HIV. In some areas of Khanabad district, the lack of medical services leads to delays in early detection and treatment of HIV. Work is underway to increase the number of mobile clinics and tests. HIV prevalence may be high in rural areas of Pakhtabad district, especially since poor sanitary and epidemiological conditions lead to late detection of the disease. Marhamat district needs to increase the population's knowledge about health care and promote a healthy lifestyle. Andijan city is one of the areas with a high prevalence of tuberculosis. Although sanitary conditions in the city center are improving, the presence of large population groups increases the risk of disease transmission. The risk of tuberculosis spread in rural areas of Balikchi district may be high, especially as a result of poor sanitary conditions. The high prevalence of hepatitis in Andijan city is due to lack of care in medical institutions and non-compliance with sanitary and hygienic rules. The prevalence of hepatitis in Marhamat district is high due to poor sanitary conditions and late detection of the disease.

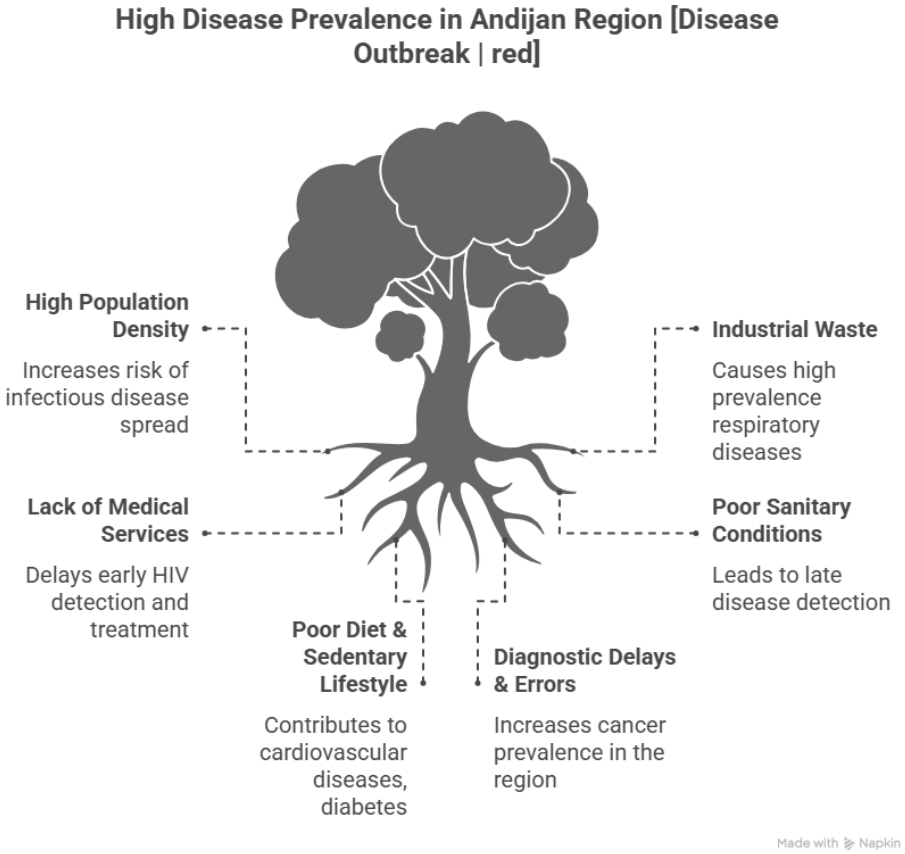

Figure 3. ***High disease prevalence in Andijan region.***

In order to prevent the spread of the disease in Shahrikhan district, measures are being taken to strengthen medical care and prevention. Non-communicable diseases - cardiovascular diseases Cardiovascular diseases are highly prevalent among the urban population of Andijan city. Factors such as poor diet, high stress, and low physical activity contribute to the spread of the disease. Industrial labor and low physical activity in Asaka are contributing to the increase in cardiovascular diseases. The prevalence of cardiovascular diseases is higher in rural areas of Khanabad district, as there is a lack of health education among the population. The prevalence of cardiovascular diseases is high among the population of Balikchi district, which is associated with lifestyle. The high prevalence of diabetes among the population of Andijan is due to poor nutrition and a sedentary lifestyle. The prevalence of diabetes in rural areas of Marhamat district may be high, as the composition of food products and physical activity are insufficient. Limited access to health services and low attention to food quality in Pakhtabad district are contributing to the increase in diabetes. Cancer Despite the availability of medical institutions and high-quality technologies in Andijan city, diagnostic delays and errors are observed. The increase in the prevalence of cancer in Shahrikhan district is associated with poor medical care in rural areas and delayed early detection of the disease. Measures taken to prevent and control the spread of infectious and non-communicable diseases extensive testing and disease detection work is being carried

out to prevent HIV, tuberculosis, hepatitis and other infectious diseases. Mobile clinics are being deployed in the districts. Attention is being paid to improving sanitary and hygienic conditions in the districts, ensuring compliance with sanitary rules in medical institutions, as well as improving the service system taking into account social needs. Information on maintaining a healthy lifestyle among the population, preventive measures, especially physical activity and proper nutrition, are being implemented in the districts. Spread of malaria in Andijan region attention is being paid to work aimed at improving the service system, taking into account social needs. In the districts, information on maintaining a healthy lifestyle among the population, preventive measures are being implemented, especially physical activity and proper nutrition. Spread of malaria in Andijan region attention is being paid to work aimed at improving the service system, taking into account social needs. In the districts, information on maintaining a healthy lifestyle among the population, preventive measures are being implemented, especially physical activity and proper nutrition. Spread of malaria in Andijan region(malaria) is an infectious disease transmitted by parasites that infect the human circulatory system. The parasites that cause malaria belong to the genus Plasmodium and are transmitted to humans by the bite of mosquitoes (Anopheles). Malaria is usually found in tropical and subtropical regions and is most common in rural areas with poor sanitation.

Conclusion. There are official statistics on the prevalence of malaria in Andijan region, collected by the centers of sanitary and epidemiological surveillance. In general, malaria in the region is mainly. It is spread in rural areas, but some diseases can also be observed in the regional center of Andijan. As for the analysis of indicators according to the spread of malaria by district, the spread of the disease is relatively low in the densely populated city center of Andijan. However, if the sanitary and hygienic culture of some residents is low, the risk still exists. Asaka has developed industrial and agricultural sectors, and there are also water resources in this district. Deficiencies in water facilities and the proliferation of mosquitoes in water can cause the spread of malaria. In rural areas of Khanabad district, sanitary conditions and water shortage problems affect the spread of the disease. At the same time, the lack of early detection and preventive work increases the risk of spread. Pakhtabad district also consists of rural areas, and more attention should be paid to combating malaria. The proliferation of mosquitoes and the difficulty in detecting infectious diseases can lead to the spread of malaria. Although measures to combat malaria are actively being taken among the population of Marhamat district, problems with sanitary and hygienic conditions and water facilities lead to the spread of malaria. Measures taken to prevent malaria include cleaning and getting rid of mosquito breeding sites (due to water accumulation), as well as the use of chemical means against mosquitoes to prevent the spread of the disease. Insecticide[5]larvicide and

[5]Insecticides (from Latin insectum - pest and caedo - to kill) are chemicals used to destroy insect pests.

larvicide[6]The fight against the spread of mosquitoes is being carried out using insecticides. Preventive treatment and testing Preventive tests and vaccines are one of the effective methods for early detection and treatment of malaria among the population. It is important to expand medical services and testing capabilities, as well as increase the ability to treat malaria early. Extensive outreach is being carried out to provide information to the population about the spread of malaria and preventive measures. Developing cooperation between health organizations, medical professionals and the local community will be effective in preventing the disease. Reforms are being implemented in the districts in the field of sanitation and drinking water supply, which will help reduce the spread of diseases.

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[6]A larvicide is a product that kills insects in their larval stage, when they are active but not yet mature.

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SUG‘ORISHNING TUPROQQA VA O‘SIMLIK O‘SISHIGA TA’SIRI

Annotatsiya: *Hozirgi kunga kelib, suv resurslaridan oqilona va samarali foydalanish mintaqada, jumladan respublikamizning barqaror iqtisodiy taraqqiyotida hal qiluvchi masalalardan biriga aylandi. Mazkur maqolada suv resurslarining tanqisligi, ularning sifatini yomonlashish jarayonlari hamda mintaqada shakllangan yangi iqtisodiy, siyosiy, ijtimoiy va ekologik muammolar haqida so‘z boradi*

Kalitso‘zlar: *sug‘orish,suv resurslari,hosil,o‘simlik,tuproq,namlik,ozuqa,tuproq qatlami,ishqoriylik,modda almashinuv,harorat.*

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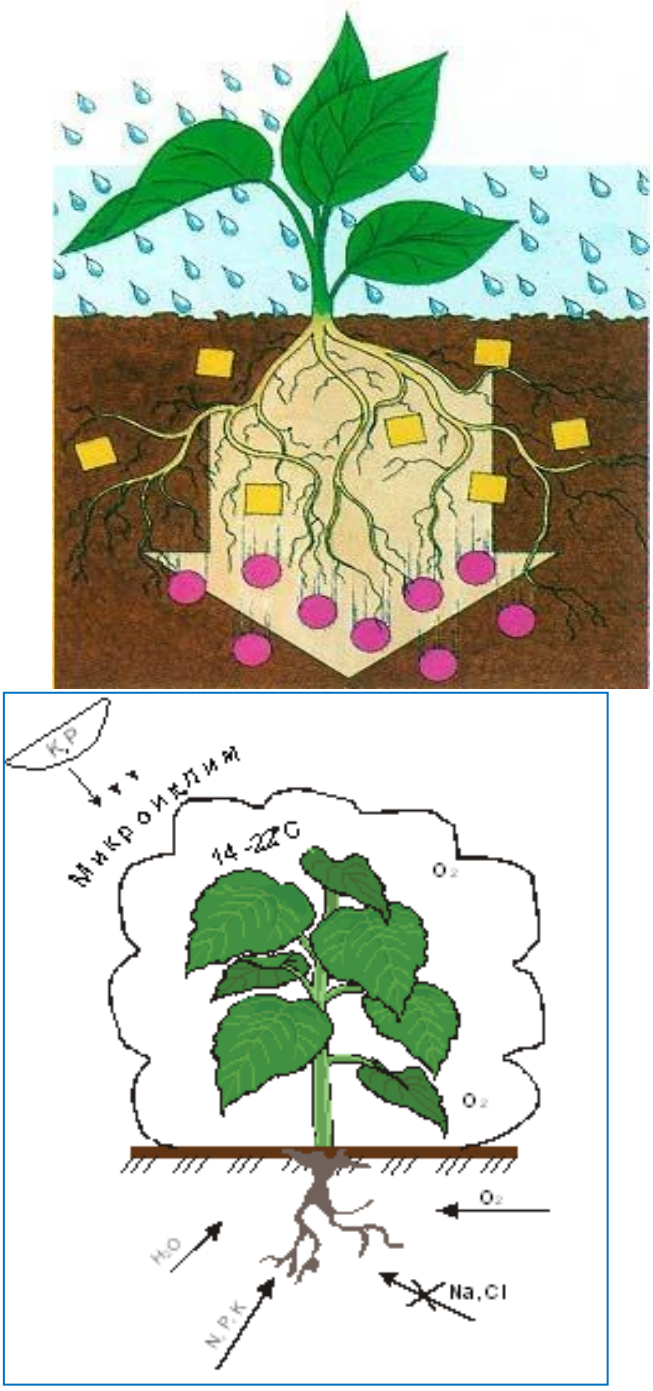
IMPACT OF IRRIGATION ON SOIL AND PLANT GROWTH

Abstract: *Nowadays, rational and efficient use of water resources has become one of the key issues in the region, including the sustainable economic development of our republic. This article discusses the scarcity of water resources, the processes of deterioration of their quality, and new economic, political, social and environmental problems that have arisen in the region.*

Keywords: *irrigation, water resources, crop, plant, soil, moisture, nutrient soil layer, alkalinity, metabolism, temperature.*

Maksimal hosil suv, ozuqa, issiqlik, havo va yorug‘lik miqdorlarini maqbul darajasida bo‘lganda erishiladi. Tuproqda namlikning keragidan ortiq yoki kam bo‘lishi hosildorlikni pasaytiradi. Birinchi holatda, tuproqda havo miqdori etishmasligidan, ikkinchi holatda esa, ozuqa va namlik miqdorlarini etishmasligidan o‘simlik qiynaladi. Sug‘orish tuproqning tabiiy namligini oshirishi bilan birga uning suv–fizik, kimyoviy xossalariga va mikrobiologik jarayoniga ham ta’sir etadi. Tuproqda namlikning normal holda saqlanishi undagi mikroorganizmlarning ko‘payishiga, organik qoldiqlarning chirib tuproq unumdorligi (unda nitratlarning paydo bo‘lishi, nitrifikatsiya) va ekin hosildorligining oshishiga olib keladi.[1] Tuproq namligining oshishi, uning sovishiga, undagi havoni siqib chiqarishga va tuproq kolloidlarini shishishi natijasida tuproqda aeratsiyaning yomonlashuviga, tuproqda oldin hosil bo‘lgan nitratlarning pastki qatlamga yuvilishiga olib kelishi mumkin. Tuproqda namlikning kamayishi undagi azotning bug‘lanishiga va tuproqdagi miqdorining kamayishiga olib keladi. Sug‘orish suvi suvda eriydigan

tuzlar va mineral moddalar uchun erituvchi hisoblanib, tuproqning ustki qatlamidagi tuzlar eritiladi, tuproq eritmasi konsentratsiyasini pasaytiradi va tuproqdagi kimyoviy jarayonga o‘z ta’sirini ko‘rsatadi. Sug‘orish natijasida tuproqning ishqoriyligi ortadi. Agarda, tuproqda eruvchi xlorid va sulfat bo‘lsa, ularning miqdori ko‘payishi bilan tuproqning ishqoriyligi kamayadi. Sug‘orish natijasida o‘simlik tuproqdan o‘ziga zarur bo‘lgan moddalarni (kaliy, azot, fosfor va h.k.) olish imkoniyatiga ega bo‘ladi.



1-rasm. Sug‘orishning tuproq strukturasiga tasiri

Sug‘orish tuproqning fizikaviy xossalariga va strukturasiga tasir etadi: - suv tuproq strukturasini buzishi mumkin (ayniqsa, bostirib sug‘orishda) o‘lchami 2,5 mm gacha bo‘lgan tuproq zarrachalariga suv tegishi bilan ular o‘lchami 1 mm dan kichik zarralarga bo‘linib ketadi. Tuproq kolloidlarining bo‘kishi zarralardagi yopishqoqligining bo‘shashi natijasida tuproqning oraliq kovakchalari kamayib, tuproqning qotqaloqlashiga olib keladi; - sug‘orish natijasida tuproqni zichlanishi kuzatiladi (ayniqsa, 0,5- 2,0 m gacha bo‘lgan tuproq qatlamida). - sug‘orish tuproq zarralarining yopishqoqligini o‘zgartiradi (namlikni ko‘paytirish tuproqni yumshatadi). Sug‘orish o‘simlik va tuproqdagi issiqlik sharoitiga ham ta’sir etadi, o‘simlikning issiqligini pasaytiradi. (ayniqsa, yomg‘irlatib va purkab sug‘orishda) tuproqning issiqlik sig‘imini oshiradi, ya’ni uning haroratini pasaytiradi.[2]

2-rasm. Tuproqni yomg‘irlatib sug‘orish usuli.(Sprinkler)

Shuning uchun yilning issiq fasllarida nam tuproq quruq tuproqqa nisbatan sovuqroq, sovuq fasllarda esa issiqroq bo‘ladi. Nam tuproqning issiqlik o‘tkazuvchanligi quruq tuproqnikiga qaraganda yuqori bo‘ladi. Qurg‘oqchil maydonlarda o‘simlik etishtirilayotgan tuproq haroratining pasayishi bilan unda modda almashinuv jarayonining yangilanishi kuzatiladi. Tuproqda haroratning oshishi o‘simlik uchun zarur bo‘lgan suv miqdorini oshiradi, transpiratsiya koeffitsentini ko‘paytiradi va undagi oziq moddalardan foydalanishni yomonlashtiradi. Sug‘orish natijasida sug‘oriladigan maydonning mikroiqlimi o‘zgaradi, chunki quyosh energiyasining aksariyat qismi tuproq va o‘simliklardagi namni bug‘latishga sarflanadi. Sug‘orish hosilning miqdorini oshiribgina qolmay, balki uning sifatini ham yaxshilaydi, chunki sug‘orish ta’sirida o‘simlik tarkibida kul, oqsil moddalar, yog‘, uglevodlar va kraxmal miqdori ham o‘zgaradi. Sug‘orish suvidan rejasiz foydalanish, dalaga ortiqcha suv berish, sug‘orish maydonidan suvni tashlamaga tashlash tuproqdagi ozuqa elementlarning quyi qatlamlarga yuvilishiga, suvning ortiqcha sarfiga, sizot suvlari sathining ko‘tarilishiga, ba’zida bu orqali sug‘orish maydonlarining sho‘rlanishiga sabab bo‘ladi. Bu holat ortiqcha xarajatlarga, hosildorlikni pasayishiga va mahsulot tannarxining oshishiga olib

keladi. Sug‘orish ta’sirida nafaqat sug‘orish massivining, balki atrof maydonlarning ham tabiiy sharoiti o‘zgarishi mumkin. Massivning umumiy suv muvozanatida sug‘orish tarmoqlari va sug‘orish dalalaridan sizilishga isrof bo‘lgan suv ko‘rinishidagi kirim miqdori keskin ortib, sug‘orish massivi va atrof maydonlarning sizot suvlari rejimga ta’sir ko‘rsatadi. Shuning uchun sug‘orish ishlari loyihalanganda massivda sizot suvlarining kelajak rejimi tahlil qilinishi, mabodo ular yer sathiga 3 m dan yaqin kelsa, sug‘orish massivi tuprog‘ini himoyalash bo‘yicha tadbirlar loyihalanib, sug‘orish loyihasi bilan birga amalga oshirilishi shart.

Xulosa: Hozirgi kunda sug‘orish uchun ishlatilayotgan suv resurslarimiz tobora kamayib ketayotganini inobatga olsak. Tuproqdagi namlikni maqbul holatda saqlash va suv tejamkor sug‘orish texnologiyalaridan foydalanish o‘simlik hayotida muxim o‘rin tutadi va tuproqning mexanik tarkibidan kelib chiqib sug‘orish ishlarini amalga oshirish eng foydalisi hamda tejamkorlikga ham yaxshi ta’sir qiladi.

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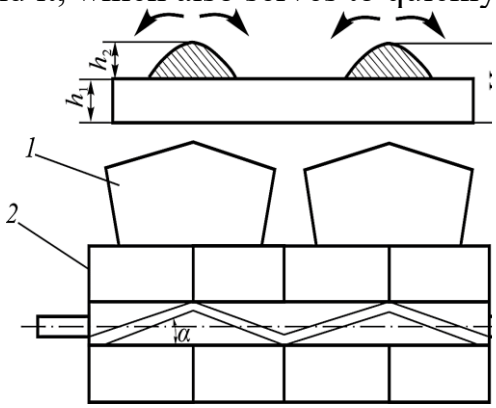
ANALYSIS OF THE WORKING PARTS OF POTATO DEEPING MACHINES

Annotation. *Currently, a number of scientists in Uzbekistan and abroad are engaged in the issue of potato cultivation and harvesting. However, to date, the issue of mechanization of potato harvesting in conditions of low soil moisture has not been fully resolved. This article provides a detailed analysis of the working parts of potato harvesting machines.*

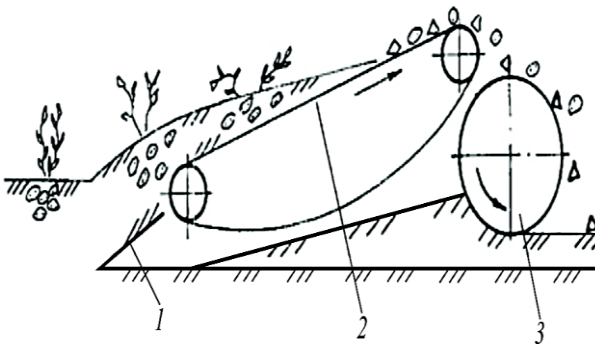
Keywords: *potato digger, combine, aggregate, profitable, resource, soil, chopper, elevator, hydraulic system, sieve.*

The scheme of the potato digger created by scientists from the Ryazan State University of Agrotechnology is shown in Figure 1.1 [5]. Its main working part is the share (1), which is made in the shape of a trapezoid. A device (2) is installed at the beginning of the elevator to accelerate the excavated mass. Also, another potato digger elevator (Figure 1.2) has a support wheel with a rubber surface mounted behind it, which also serves to quickly crush the soil [6].



1-trapezoidal coulters; 2-accelerating device

Figure 1.1.
Potato digger diagram



1-scythe; 2-elevator; rubber wheel.

Figure 1.2.
Potato digger diagram

A lot of research work has been carried out on the process of sifting the soil-potato mass and the creation of a sifting working body [7; 185-p., 8; 218-p., 9; 168-p., 10; 145-p., 11; 186-p., 12; 140-141-p., 13; 75-80-p., 14; 76-81-p.].

The sifting and sorting working parts of potato diggers are divided into two main parts depending on the place of installation in the technological schemes of potato diggers and combines:

- primary sorting working parts;

- secondary sorting working parts.

The primary sorting section separates 60–70% of the potatoes from the soil, while the secondary sorting section separates the remaining potatoes from the soil.

The following main requirements are imposed on working bodies of this type: high productivity of the main screening working bodies (150 kg/h), minimal loss and damage of nodules (2–3%), high operational reliability and simplicity of design, simultaneous sifting of the soil and upward transfer of the mass, ensuring greater separation of nodules from the soil (70–80%)

The main types of primary screening working parts of potato diggers are shown in Figure 1.3.

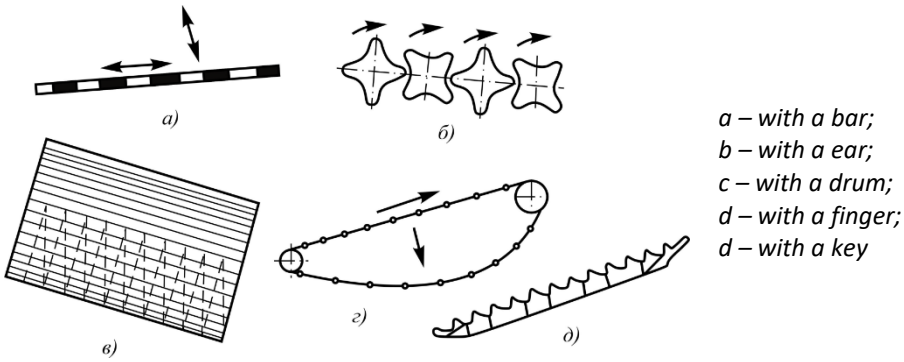


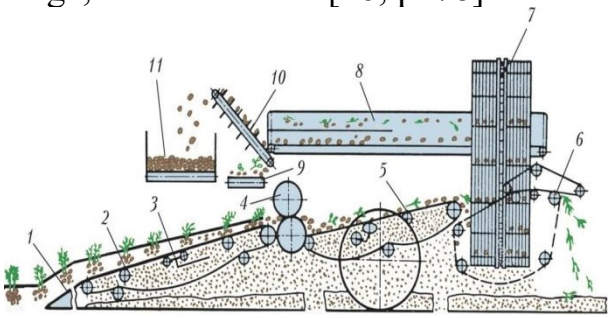
Figure 1.3.
Types of primary screening working parts of potato diggers

The screw elevator (Fig. 1.3, a) has been the main working unit of potato harvesters in the world for more than a century, although it was invented. The main reason for its widespread use is its simplicity of design and the ability to simultaneously sift and transport the layer upwards at an angle of inclination of 20° [15; p. 62].

Along with these good features, slatted elevators also have disadvantages: friction occurs on a large surface, which accelerates the wear of parts and leads to a large expenditure of energy to move the elevator slats. This is because the slatted surface accounts for 40% of the total surface area; the relative surface area is small (less than 70%); when working in fields with wet soil, soil can get stuck between the slats, etc. The advantage of vibrating grate shakers (Fig. 1.3, a) is that they can easily maintain the distance between the bars within the required range (10-20 mm) by periodically changing the grate [15; p. 145].

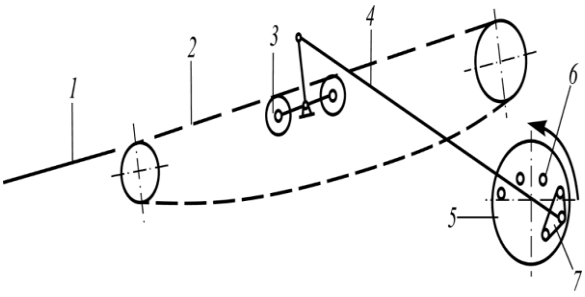
Separators equipped with a vibrating mechanism with a hopper constitute a large group (Fig. 1.3, b). Their advantage is the absence of inertial forces and friction, good separation of soil particles and plant residues. The disadvantage is the high damage to the nodules. In the past, potato diggers in many cases used drum-type vibrating elevators (Fig. 1.3, v). Their advantages are mainly reliability, non-slip properties and the ability to lift the soil mass upwards. However, clogging of the drum with plant residues and wet soil sharply reduces the threshing capacity.

According to Sorokin A.A., potato harvesters with a tine elevator, when high agrotechnical conditions are applied to the field and the optimum humidity is 18–20%, can separate 85% of the soil. Therefore, the above-mentioned tine elevators and separators are of great importance in potato harvesting, and their operation leads to high-quality secondary threshing, cleanliness in the threshing unit, lack of damage, and low losses [16; p. 78].



1 – plowshare; 2 – roller; 3 – shaking mechanism; 4 – pneumatic chopper drum; 5 – drive shaft; 6 – shaft driving the stem separator; 7 – lifting drum; 8 – sorting table; 9 – conveyor for loading the separated mass; 10 – conveyor; 11 – hopper

Figure 1.4. Technological scheme of the "KKU-2A" combine harvester



1 – plowshare; 2 – main elevator; 3 – rollers; 4 – connecting rod; 5 – disc; 6 – holes; 7 – plank

Figure 1.5. Scheme of the shaking mechanism of the KKU-2A combine

The two-row "KKU" combine harvester generation, developed jointly by the Russian Research Institute of Agricultural Machinery (VISKHOM) and the Ryazan GSKB, is the most mass-produced potato harvesting equipment, and the one currently in use is the KKU-2A combine harvester (Figure 1.4). Its main screening device is the shaking mechanism (Figure 1.4) consisting of a pair of rollers 3 mounted at the end of a two-arm lever driven by a connecting rod 4 mounted on the combine elevator. It should be noted that the KKU-2 A combine has a number of disadvantages: low technological reliability, excessive weight of the machine, and frequent damage to the nodes. The main elevator of the AVR "Spirit-4100" and "Grimme" DR-1500 potato harvesters uses a vibrating mechanism of the elevator cloth to accelerate the sifting process (Figures 1.6 and 1.7). The disadvantage of mechanical vibrating mechanisms is that they cannot generate sufficient vibrations in the low frequency range required for crushing large pieces [17].

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SEMICONDUCTOR MATERIALS: CURRENT DEVELOPMENTS AND TECHNOLOGICAL ADVANCEMENTS

Abstract: *Semiconductor materials play a crucial role in the current technology landscape and are at the forefront of many innovations and breakthroughs. This article explores the latest developments in semiconductor materials, including their applications in various industries, emerging trends, and potential impact on future technological landscapes.*

Key words*: semiconductor, material, potential, microcircuit, microelectronics.*

Semiconductor materials have been fundamental in shaping the modern world, serving as the building blocks for electronic devices, communication systems, and renewable energy technologies. Recent advancements in semiconductor materials have opened up new possibilities for enhancing device performance, energy efficiency, and functionality across multiple fields. This thesis delves into the current developments in semiconductor materials, highlighting their significance and potential implications for future technological advancements.

Body:

1. Semiconductor Materials Overview:
   - Definition and properties of semiconductor materials
   - Importance of semiconductors in electronics and technology
2. Applications of Semiconductor Materials:
   - Role of semiconductors in microelectronics and integrated circuits
   - Semiconductor materials in optoelectronics, photovoltaics, and renewable energy technologies
   - Semiconductor advancements in sensors, imaging devices, and medical applications
3. Current Developments in Semiconductor Materials:
   - Nanoscale semiconductor materials and their impact on device miniaturization
   - Emerging materials such as perovskites, quantum dots, and 2D materials
   - Advancements in semiconductor manufacturing processes and techniques
4. Technological Trends and Future Directions:
   - Internet of Things (IoT) and the demand for efficient semiconductor devices
   - Artificial intelligence and machine learning applications driving semiconductor innovations

- Sustainability and environmental considerations in semiconductor material development

Semiconductor materials are elements or compounds that have electrical conductivity between that of a conductor and an insulator. Here are some properties of semiconductor materials:

1. Conductivity: Semiconductors have conductivity levels between that of conductors (metals) and insulators. Their conductivity can be altered by introducing impurities or by applying an electric field.

2. Band Gap: Semiconductors have a band gap, which is the energy difference between the valence band (highest energy band of electrons) and the conduction band (lowest energy band of free electrons). This band gap determines the electrical conductivity of the material.

3. Temperature Dependence: The conductivity of semiconductors increases with temperature unlike conductors, but it decreases with temperature for insulators.

4. Mixtures: Semiconductors can be doped with specific impurities to change their electrical properties. Adding impurities increases the number of charge carriers in the material, thus affecting its conductivity.

5. Applications: Semiconductor materials are widely used in electronic devices such as transistors, diodes, and integrated circuits. Their properties make them suitable for controlling and amplifying electrical signals in various devices.

Common semiconductor materials include silicon, germanium, and gallium arsenide, each with its unique properties and applications in the electronics industry.

Semiconductors play a pivotal role in microelectronics and integrated circuits (ICs), forming the foundation upon which modern electronic devices are built. Here's a breakdown of their role:

Conductivity Control: Semiconductors have electrical conductivity between conductors (metals) and insulators (non-conductors). This property allows precise control of electrical currents within electronic devices. By doping semiconductors with specific impurities, engineers can manipulate their conductivity, enabling the creation of transistors and diodes.

Transistors: Transistors are the building blocks of digital circuits. They amplify or switch electronic signals and are fabricated using semiconductors. Commonly made from silicon, transistors consist of three layers: the emitter, base, and collector. By applying a voltage to the base, the transistor can control the flow of current between the other two layers, allowing for amplification or switching functions.

Diodes: Diodes are semiconductor devices that allow current to flow in one direction while blocking it in the opposite direction. They're fundamental components in rectifiers, voltage regulators, and signal demodulators. Diodes are crucial for converting alternating current (AC) to direct current (DC) and for controlling the direction of current flow in electronic circuits.

Integrated Circuits (ICs): Semiconductors are the backbone of integrated circuits. ICs consist of multiple interconnected electronic components, such as transistors, diodes, resistors, and capacitors, all fabricated on a single semiconductor

substrate. ICs come in various forms, including microprocessors, memory chips, and sensors. Their compactness, reliability, and low power consumption make them indispensable in modern electronics.

Miniaturization and Moore's Law: Semiconductors have fueled the miniaturization trend in electronics, as described by Moore's Law. This observation, made by Intel co-founder Gordon Moore, states that the number of transistors on a microchip roughly doubles every two years, leading to increased computational power and reduced cost per transistor. Advances in semiconductor fabrication techniques, such as photolithography and semiconductor doping, have enabled the continual shrinking of transistor sizes, paving the way for smaller, faster, and more energy-efficient electronic devices.

Applications: Semiconductors are ubiquitous in modern technology, powering everything from smartphones and computers to automotive electronics and medical devices. They enable the functionality of digital cameras, GPS systems, communication networks, and countless other electronic systems that shape our daily lives. In summary, semiconductors are the foundation of microelectronics and integrated circuits, enabling the creation of complex electronic devices that have revolutionized technology and society. Semiconductor materials play crucial roles in various optoelectronic, photovoltaic, and renewable energy technologies. Here's a breakdown of their significance in each area:

Optoelectronics:

Light Emitting Diodes (LEDs): Semiconductor materials like gallium nitride (GaN), gallium arsenide (GaAs), and indium gallium nitride (InGaN) are used in LEDs. When electrons and holes recombine in these materials, they emit photons, producing light. LEDs are employed in displays, lighting applications, and optoelectronic devices.

Lasers: Semiconductor lasers utilize materials such as gallium arsenide (GaAs), indium phosphide (InP), and gallium nitride (GaN) to generate coherent light through stimulated emission. Semiconductor lasers are integral to telecommunications, optical storage, medical applications, and industrial processes.

Photodetectors: Semiconductor photodetectors convert light into electrical signals. Silicon photodiodes are commonly used in light sensors and cameras, while other semiconductor materials like indium gallium arsenide (InGaAs) are employed in infrared detectors for telecommunications and night vision applications.

Photovoltaics: Solar Cells: Semiconductor materials, primarily silicon, form the basis of solar cells. When photons strike the semiconductor material, they generate electron-hole pairs, creating an electric current. Other semiconductor materials, such as cadmium telluride (CdTe), copper indium gallium selenide (CIGS), and perovskites, are also used in thin-film and emerging solar cell technologies. These materials offer advantages such as lower production costs, flexibility, and higher efficiency.

Solar Panels: Solar panels consist of interconnected solar cells, typically made from crystalline silicon or thin-film semiconductor materials. They convert

sunlight into electricity, providing a renewable energy source for residential, commercial, and industrial applications.

Renewable Energy Technologies: Power Electronics: Semiconductors are integral to power electronics devices used in renewable energy systems, such as inverters and converters. Silicon carbide (SiC) and gallium nitride (GaN) are gaining traction in power electronics due to their high efficiency, high-temperature tolerance, and fast switching speeds. These materials enable more efficient conversion and management of electrical energy in renewable energy systems.

Energy Storage: Semiconductor materials are also utilized in energy storage devices, such as lithium-ion batteries. Silicon anodes and other semiconductor-based materials are being researched to improve the energy density, cycle life, and safety of batteries, contributing to the widespread adoption of renewable energy storage solutions.

In summary, semiconductor materials are essential components in optoelectronic devices, photovoltaic systems, and renewable energy technologies, enabling the efficient generation, conversion, and storage of energy from renewable sources. Continued research and development in semiconductor materials hold the potential to further enhance the performance and sustainability of these technologies.

Conclusion:

Semiconductor materials continue to drive innovation and shape the future of technology across various industries. Understanding the current developments in semiconductor materials is crucial for staying abreast of technological advancements and harnessing the potential for creating more efficient, sustainable, and impactful devices. This thesis aims to provide insights into the evolving landscape of semiconductor materials and their implications for future technological developments.

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PEDAGOGIK INNOVATSIYALAR LOGISTIKASINING PEDAGOGIKA FAN TARMOQLARI BILAN ALOQADORLIGI

Annotatsiya: *Ushbu maqolada logistika tushunchasi, logistikaning rivojlanish tarixi, logistika fani va uning pedagogik tizimga tatbiq etilishi, pedagogik logistikani rivojlantirish masalalari hamda pdagogik jarayonlarda logistik yondashuvni qo'llash usullari yoritilgan.*

Kalit so'zlar: *Logistika, ta'lim tizimi, pedagog, ta'lim resusrslari, ta'lim jarayoni, pedagogik logistika, tizimli yondashuv, monitoring va narozat.*

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RELATIONSHIP OF LOGISTICS OF PEDAGOGICAL INNOVATIONS WITH THE FIELDS OF PEDAGOGICAL DISCIPLINES

Abstract: *This article describes the concept of logistics, the history of the development of logistics, the science of logistics and its application to the pedagogical system, the issues of the development of pedagogical logistics, and the methods of applying the logistic approach in pedagogical processes.*

Keywords: *Logistics, education system, teacher, educational resources, educational process, pedagogical logistics, systematic approach, monitoring and feedback.*

Ishlab chiqarish munosabatlarining rivojlanishida moddiy, moliyaviy va axborot resurslari oqimlarining ahamiyati katta. Ana shu moddiy, moliyaviy va axborot oqimlari logistika fanining obyekti bo'lib hisoblanadi.

Logistika fani moddiy, moliyaviy va axborot oqimlarini joriy manba'idan to iste'mol sohasigacha bo'lgan harakatini rejelashtirish, tashkil etish, boshqarish, optimallashtirish, nazorat qilish va muvofiqlashtirish to'g'risidagi fandir. Moddiy va unga taaluqli bo'lgan boshqa barcha oqimlarning ro'y berishi, harakati, miqdoriy va sifat o'zgarishlarini logistika nuqtai nazaridan mikro yoki makro darajada o'rganish, tadqiq qilish va boshqarish tizimli yondashishni talab qiladi. Bunda yuqorida ta'kidlangan jarayonlar bir butun va ma'lum maqsadga yo'naltirilgan tizimning o'zaro uzviy bog'langan elementlari deb qaraladi. Moddiy oqimlar ta'minot, ishlab chiqarish, taqsimot va iste'mol jarayonlarining turli bo'g'inlaridan o'tganda turlicha miqdoriy, tarkibiy va sifat o'zgarishlari ro'y beradi. Logistika sohasidagi faoliyat

ko'p qirralidir. Ularga tashish va, taqsimot jarayonlari, zahira va ombor xo'jaliklarini boshqarish, axborot tizimini tashkil qilish, tijorat va moliyaviy faoliyatlarni boshqarish kabilar kiradi.

Logistika (yunoncha fikr yuritish san'ati, keyinchalik - armiya va uning harakatini ta'minlash, matematik logistika).

Qadimgi matematikada logistika o'sha paytda ma'lum bo'lgan hisoblash va o'lchash algoritmlarining kombinatsiyasi sifatida tushunilgan. Leybnits "logistika" atamasini o'z xulosalarini hisoblashda ishlatgan. Bugungi kunda ushbu mavzu universal e'tirofga sazovor bo'ldi va ko'plab sohalarni o'z ichiga oladi. Bugungi kunda Yevropa, Amerika va Sharqning logistika sohasidagi qarashlari bir-biriga ziddir.

Amerikalik logistika muhandislari logistikani menejment, texnologiya va texnik faoliyatning san'ati va fani sifatida tushunchasiga amal qiladilar, unga rejani amalga oshirish va maqsadga erishish uchun transport vositalarini rejalashtirish, yetkazib berish va foydalanish kiradi.

Logistikaning birinchi amaliy potensialini amerikalik ekspertlar Pol Convers va Piter Dyuker tomonidan bashorat qilingan. Ular uning potensialini "xarajatlarni tejashning so'nggi chegarasi" va "iqtisodiyotning noma'lum quroli (yoki materigi)" deb belgilab qo'yishdi. Logistika sohasidagi kengaytirilgan talqinning tarafdorlari fransuz mutaxassislari E. Mate va D. Tikselar bo'lib, ular quyidagi fikrlarni berishgan "kompaniyaning sheriklar bilan munosabatlarini muvofiqlashtirish usullari va bozor tomonidan taqdim etilgan talabni muvofiqlashtirish vositasi va kompaniya tomonidan ilgari surilgan taklif, turli xil bo'linmalarning sa'y-harakatlarini birlashtirishga imkon beradigan korxona faoliyatini tashkil etish usuli. Kompaniya o'zining iqtisodiy maqsadlarini amalga oshirish uchun foydalanadigan moliyaviy, moddiy va mehnat resurslarini optimallashtirish maqsadida tovarlar va xizmatlar ishlab chiqarish."

Logistika va pedagogika integratsiyasidan kelib chiqadigan asosiy xulosalar quyidagilardan iborat:

1. **Samaradorlik va Optimizatsiya**: Logistikning asosiy tamoyillari - resurslardan oqilona foydalanish, jarayonlarni takomillashtirish, vaqt va xarajatlarni kamaytirish - ta'lim tizimiga tatbiq qilinishi orqali ta'lim jarayonlarini samarali tashkil etish va optimallashtirishga imkon beradi.

2. **Moslashuvchanlik va Dinamika**: Logistika doirasidagi har doim o'zgaruvchan sharoitlarga moslashish ko'nikmasi ta'lim tizimining tezkor va tanqidiy fikrlash qobilyatini rivojlantirishga yordam beradi.

3. **Axborot Boshqaruvi**: Ta'lim tizimida logistika usullaridan foydalanish orqali o'quv resurslarini, ma'lumotlarni va axborot oqimlarini oqilona boshqarish imkoniyati paydo bo'ladi.

4. **Resurs Boshqaruvi**: Logistik yondashuvlar orqali ta'lim muassasalarida moddiy-texnik bazani, moliyaviy va insoniy resurslarni samarali boshqarish va taqsimlash amalga oshirilishi mumkin.

5. **Tashkiliy Tuzilma**: Logistika "eshkakning olti sinfi"ni - yuk tashish, saqlash, partiyalarni komplektlash, qabul qilish, jarayonlarni boshqarish va

axborotni boshqarish - ta'lim tizimiga moslashtirib qo'llash orqali tashkiliy tuzilmani takomillashtirish mumkin.

6. **Sifat va Xizmat Darajasi**: Logistikning asosiy maqsadi talablar va ehtiyojlarni qondirish bo'lib, ushbu tamoyilni ta'lim jarayonlariga joriy etish orqali o'quvchilarning ta'lim olish sifati va xizmat darajasini oshirish imkoniyati mavjud.

Ushbu asosiy xulosalar ta'lim tizimidagi muammolarni bartaraf etish, samaradorlikni oshirish va umumiy raqobatbardoshlikni ta'minlash uchun logistika va pedagogika integratsiyasining ahamiyatini yaqqol ko'rsatadi.

Logistika va pedagogika o'zaro aloqador bo'lgan, bir-birini to'ldiruvchi tizimlardir. Ularning integratsiyasi ta'lim sifati va samaradorligini oshirish uchun muhim ahamiyat kasb etadi. Quyidagi xulosalarni keltirib o'tish mumkin:

1. Resurs samaradorligi: Logistika metodlari va yondashuvlari orqali o'quv jarayonlarida moddiy, moliyaviy, kadrlar va boshqa resurslardan oqilona foydalanish mumkin. Bu ta'lim sifati va samaradorligini ta'minlaydi.

2. Jarayonlarni boshqarish: Logistik yondashuv o'quv jarayonlarini rejalashtirishda, tashkil etishda va boshqarishda samarali yechimlarni taklif etadi. Bu o'quv faoliyatlarining uzluksizligi va muvofiqligini ta'minlaydi.

3. Innovatsion yechimlar: Logistika va axborot-kommunikatsiya texnologiyalarining integratsiyasi pedagogik jarayonlarni modernizatsiyalash, masofaviy ta'lim va boshqa innovatsion yondashuvlarni joriy etishga imkon beradi.

4. Xalqaro tajribalardan foydalanish: Logistika sohasidagi xalqaro tajribalarni o'rganish va milliy ta'lim tizimiga moslashtirib qo'llash pedagogika sohasida yangi yechimlarni taklif qiladi.

5. Kadrlar tayyorlash: Logistika va pedagogika integratsiyasi doirasida pedagogik jarayonlarni logistik jihatdan boshqarish bo'yicha mutaxassislar tayyorlash tizimini rivojlantirish maqsadga muvofiqdir.

Xulosada aytish mumkinki, logistika va pedagogika integratsiyasi ta'lim sifati va samaradorligini oshirish, innovatsion yechimlarni joriy etish, xalqaro tajribalardan foydalanish, hamda kadrlar tayyorlash kabi masalalarda muhim rol o'ynaydi. Shuningdek, logistika va pedagogika integratsiyasi ta'lim sifati va samaradorligini oshirishning asosiy vositasi sifatida xizmat qiladi. Bu integratsiya ta'lim jarayonlarini boshqarish va tashkil etishda samarali yechimlarni taklif etadi.

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OMON MATJON SHE’RLARINING MAKTAB DARSLIKLARIDA O‘QITISH METODIKASI

Annotatsiya. *Maqolada O.Matjonning 6-9-sinf adabiyot darsliklarida berilgan she`rlari tahlili xususida so‘z yuritiladi. She`r o‘qish mahorati, she`r o‘qitish metodikasi, intonatsiya, ma`no va talqin jihatlariga e`tibor qaratiladi. Shuningdek, maqola maqsadiga erishishda adabiyotshunos-metodist olim va olimalarning qo‘llanmalariga murojaat qilingan.*

Kalit so‘zlar: *adabiyot darsligi, she`r, turnalar, ko‘klam, dars ishlanma, empatiya metodi, intonatsiya, “Avvalgilarga o‘xshamas” she`ri, konsept, “she`r tahlili” jadvali, bayt, misra.*

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METHODOLOGY OF TEACHING OMON MATJON'S POEMS IN SCHOOL TEXTBOOKS

Abstract. *The article deals with the analysis of O.Matjon's poems given in literature textbooks for grades 6-9. Attention is paid to the skills of reading poetry, poetry teaching methodology, intonation, meaning and interpretation. Also, in achieving the goal of the article, reference is made to the manuals of literary critics and methodologists and scholars.*

Keywords: *literature textbook, poem, cranes, koklam, lesson development, empathy method, intonation, poem "Unlike the Previous Ones", concept, "poem analysis" table, couplet, line.*

Kirish. Omon Matjon ijodi rang-barang. Unda turli mavzularda yozilgan she`r va dostonlarni uchratish mumkin. Vatan, tabiat, ona, muhabbat, bolalik, ajdodlar yodi kabi beg‘ubor va muqaddas tuyg‘ulardan tortib, mardlik va nomardlik, bag‘rikenglik va xasislik, sadoqat va xiyonat, sobitlik va munofiqlik, poklik va qoralik kabi azaliy bir-biriga zid, ammo yonma-yon bo‘lgan; insoniyatni doim o‘ylashga, tafakkur qilishga undagan tuyg‘ular shoir she`rlarida tarannum etiladi. Xuddi shunday tabiat haqidagi she`rlaridan biri O‘zbekiston Respublikasi Xalq ta`limi vazirligi tomonidan nashrga tavsiya etgan 6-sinf adabiyot darsligiga kiritilgan bo‘lib, o‘quvchilarni qiziqtirishi shubhasiz.

Asosiy qism. Dastavval, darslikda shoir hayoti va ijodiga qisqacha to‘xtalgan bo‘lib, bu endigina tanishayotgan yoshqalb egalari uchun shoir shaxsiyati va kim ekanligi haqidagi faktlar bilan namunaviy taassurot uyg‘otadi: “Shoirning eslashicha, kechalari moychiroq yorug‘ida kattalar aytgan ertaklar, xalq qo‘shiqlari,

she`rlarini hayrat bilan tinglab ulg‘aygan. Dastlabki she`ri maktabda o‘qib yurgan paytida gazetada bosilib chiqqan”[1.208]. O‘zbekiston xalq shoiri Azim Suyunning “Yomg‘ir yog‘ib o‘tdi…”, Omon Matjonning “Osmon sog‘inch kabi…” she`rlari bir sahifada ketma-ketlikda berilgan bo‘lib, har ikkisi ham o‘quvchilarda tabiatning go‘zal manzaralaridan tasavvur uyg‘otadi. To‘rt kufletdan iborat she`rning so‘nggi misralariga yuzlansak:

“Ana, ana ular! Safbasta, mumtoz,
Barisi bir jon-u bir tan-u bir par.
Izidan olamni etkizib parvoz,
Qaytib kelayotir yurtga turnalar”[2.210].

O‘qituvchi she`rni avvalo, o‘zi ifodali o‘qiydi, ma`no-mazmunini tushunib oladi so‘ngra bolalarga o‘rgatadi. Mana shu jarayonda she`rning umumiy mohiyatini o‘zida qamrab olgan **“She`r tahlili”** jadvali bizga qo‘l keladi. Bu jadvalni “Osmon sog‘inch kabi…” she`ri misolida bilib olamiz:

Tabiat konsepti	**Ko‘tarilgan mavzular**	**Sifatlash**	**Mavhum otlar**	**Antonimlar**	**Sinonimlar**
Osmon	tabiat manzarasi	sog‘inch kabi	sog‘inch	qish	olam
qirlar	turnalarning qaytishi	poyonsiz	xabar	ko‘klam	borliq
qizg‘aldoq	ko‘klam	yashil	zarda		xabar
tog‘lar	parvoz		borliq		mujda
lolalar	xushxabar		olam		
borliq			jon		

Jadval she`r strukturasini yaqqol namoyon etgan holda uning tahlilini osonlashtiradi. Mulohzalar shaklan bo‘lib olinadi keyin umumlashtiriladi. Shu o‘rinda dars ishlanma ham pedagog uchun muhim ahamiyatga ega. Dars jarayonini tashkil etishdan oldin har qanday badiiy asarni tushuntirishda bu uslubdan foydalanish ham foydadan holi emas:

6-sinfda Omon Matjonning “Osmon sog‘inch kabi poyonsiz…” she`rining o‘rganishiga oid elektron dars ishlanmasi namunasi.

Maqsad.

**Ta`limiy maqsad:** o‘quvchilarga she`rda turnalarning qaytishi orqali tabiat go‘zalliklari tasvirlanganligi, tomlardagi lolaqizg‘aldoqlar, tog‘lardagi lolalar arg‘uvon mujda - qirmizi xushxabardan darakligi, qishning sovuqliklariortda qolib, turnalarning qur-quri - ko‘klam deya jar solayotganga o‘xshatilishi yuzasidan bilim berish.

Tarbiyaviy maqsad: o‘quvchilarni tabiatsevarlik ruhida tarbiyalash, ularda tabiatni qadrlash tuyg‘ularini uyg‘otish.

Rivojlantiruvchi maqsad: o‘quvchilarning asarda ilgari surilgang‘oyalar yuzasidan mustaqil fikrlash ko‘nikmalarini shakllantirish, nutqini o‘stirish

Dars turi: yangi bilim beruvchi

Dars metodi: ijodiy o‘qish, empatiya metodlari

Darsda foydalaniladigan jihozlar: kompyuter, multimedia vositalari, shoir ijodi, asarga oid ko‘rsatmali va didaktik materiallar, audiomaterial va videolavhalar.

Shuningdek, **Darsni mustahkamlash** qismida “Empatiya” metodini qo‘llash quyidagicha amalga oshiriladi. Lirik qahramon ichki dunyosiga “kirish” orqali uning ichki kechinmalarini, tabiatga shaydo tuyg‘ularini his qilishga o‘rgatish.

“**Empatiya metodi** (kirishish) - bu insonning boshqa obyekt holatiga kirishidir. O‘quvchi hissiy-obrazli va fikriy tasavvuri vositasida o‘rganilayotgan obyekt ichiga “kirib olish”ga, uni tushunishga va obrazga oid xususiyatlarni idrok etishga harakat qiladi. Natijada obekt ichga kirish holadida o‘quvchi o‘zini-o‘zi kuzatish va baholashga sharoit yaratiladi; foydalanilmagan imkoniyatlari yuzaga chiqadi; o‘quvchilarning obrazli va fikriy tasavvuri ortadi; dunyoqarashi boyiydi”[3.32].

Lirik asarlar ustida ishlash darslarining mas`uliyatli lahzalaridan biri matnni, albatta, o‘qituvchi tomonidan yoddan ifodali o‘qilishi va o‘quvchilarning uni tinglay olishidir. Shu o‘rinda professor Qozoqboy Yo‘ldoshevning quyidagi ogohlantirishi nihoyatda o‘rinli: “Ko‘pchilik o‘qituvchilar, hatto, ayrim uslubiyotchi olimlar ham ifodali o‘qish deganda, baland ovoz bilan tinish belgilariga rioya qilib ko‘tarinki ruhda qiroat qilishni tushunadilar. Holbuki, asl lirik asarlarni aksariyat hollarda bor ovoz bilan o‘qib bo‘lmaydi. Hatto, baland, ko‘tarinki, binobarinnosamimiy ifoda she`rdagi mayin lirizmni yo‘qqa chiqarishi mumkin. Xullas, ifodali o‘qish bu - ijodkor holatini tuyib, asarga muhrlangan ruhiy manzaralar bag‘rida turib o‘qiy bilish demakdir”[4.235].

Shuningdek, she`rning faqat mazmunida turib qolmaslik, undagi yana yashirin tuyg‘ularni ochishga harakat qilish kreativlikni yuzaga keltiradi; aks holda she`r jonlantirish ruhidan chekinadi: “Ma`lumki, she`rdagi mazmun tuyg‘u bilan qorishiq. Adabiyot darslarida nazmiy matnni ifodali o‘qishga har bir so‘z zimmasiga ortilgan yukka, tuyg‘ular ifodasiga o‘quvchie`tiborini qaratadigan savol-topshiriqlar tuzishga katta e`tibor qaratiladi. O‘quvchining she`r matnini qayta hikoyalashiga yo‘l qo‘yilmasligi maqsadga muvofiqdir. Chunki mazmun aytib berilganda she`rning ta`sir kuchi yo‘qoladi”[5.233].

9-sinf adabiyot darsligidan O.Matjonning qator turkum she`rlari joy olgan bo‘lib, ulardan “Avvalgilarga o‘xshamas”[6.232] muxammasi ayniqsa, e`tiborni tortadi. She`r “Jadid” gazetasining 2024 yil 9-fevral, 7-sonida ham berilgani o‘tmish va bugungi zamonning tamoman farqlanishi, o‘xshashliklari ma`lum miqdorda kamayib borayotgani bilan insoniyatni o‘ziga jalb qilgani bilan diqqatga sazovordir. Ushbu she`rni ham **“She`r tahlili”** jadvaliga solamiz:

Shaxs konsepti	Ko‘tarilgan mavzular	Sifatlash	Mavhum otlar
Shirin	zamon tuzumi	oy	charx
Layli	subutsiz podshohlar	yulduz	falak
Farhod	xiyonatkor ayollar	quyosh	alamlar
Majnun	noshukrlik	g‘am	yolg‘onchilik
Navoiy	to‘g‘rilikka da`vat	sanam	ishq
Jamshid	munofiqlik	oyina	ko‘ngil
Faridun	bevafolik		hajr
Shoh G‘oziy	o‘tinch		

Jadval she`rning umumiy mazmun-mohiyatini qismlarga ajratib, undagi yana ko‘rish mumkin bo‘lgan, yashirin tuyg‘u va kechinmalarni topishga yordam beradi; tarixiy shaxslar hayoti va ijodidan qo‘shimcha bilim va tarixiy voqealardan xabador bo‘lishga, o‘tmish va bugungi zamonni qiyoslash va mulohaza qilishga chorlaydi. Bir so‘z bilan aytganda, “She`r tahlili” jadvali innovatsion texnologik yondashuvdir. She`rga qaytadigan bo‘lsak, azaliy ijtimoiy-siyosiy muammolarni, aniqrog‘i illatlarni ko‘tarib chiqqan. Jumladan, bul zamonning davri, (inson) qadri, (ko‘ngil) dardi, hatto, (yor) hajri ham avvalgilarga o‘xshamasligi mumtozqalb shoir tomonidan ta`sirli ifodalangan. She`rda talmeh san`atidan unumli foydalanilgan bo‘lib(yuqorida jadvalda keltirilgan), bugungi xotin-qizlarning Layli va Shiringa, muhabbat bobida yigitlar Farhod-u Majnunga - avvalgilarga o‘xshamasligiga nisbat beriladi.

Shoirning ushbu she`ri 7 baytlik, misralar soni beshlik - muxammas shaklida yozilgan bo‘lib, qofiyalari: *hajri ham, ne sitam, ul sanam, bu alam, rasvoyi dijam, azmu haram, karam* kabi so‘zlar baytlarni bir-biriga bog‘lash uchun xizmat qilgan. Bundan tashqari har bir baytning ichki qofiyalari quyidagilardan iborat: 1-bayt: *bu dam, davr-u raqam, qadri ham, dard-u g‘am;* 2-bayt: *elni juda, behuda,o‘zimni-da, zimnida;* 3-bayt: *hujrakim, hakim,ichmakim, ichrakim;* 4-bayt: *nisor, or, xor, yor;* 5-bayt: *ushltmang, uyg‘atmang, ishlatmang, o‘xshatmang;* 6-bayt: *sana, pana, tana, yana;* 7-bayt: *rasmikim, aslikim, kasbikim, vasfikim;* radifi: *avvalgilarga o‘xshamas.*

Adabiyot darsligiga kiritilgan mazkur she`rni o‘qitishda o‘qituvchi avvalo, o‘quvchilarning dunyoqarashi, ayni vaqtdagi ijtimoiy hayotiga bog‘lab tushuntirishi joizdir. Ya`ni, o‘zgaruvchan tabiat, beqaror tuyg‘ular, osmondagi orzular girdobida bo‘lgan, beg‘ubor bolalikdan jiddiy kattalikka olib boradigan yo‘lni kechayotgan o‘spirin yigit-qizlar nigohida she`r faqat go‘yo bir mavzuda, bir qobiqda bo‘lib tuyulmasligi kerak. Bugungi hayot endi bolalik kechinmalariga o‘xshamasligi, endi oldingidek yengil emas, balki hamma narsaga jiddiy, xushyorlik bilan qarash

lozimligi; mulohazakorlikka, ogohlikka undash; tarixiy shaxslardan misollar keltirish; badiiy asar qahramonlarining hayoti bilan bugungi raqamlashtirish zamonida tafovutlar bo‘lsa-da(uchar gilamlar o‘rniga - samolyot, xat tashuvchi kabutar o‘rniga - telefon, ot o‘rniga - avtomobil va h.k), ulardagi ma`naviyat, sadoqat,ishonch va iroda, jasorat har qanday zamonda tan berish kerak bo‘lgan tushunchalar ekanligini o‘quvchilarga anglata bilish orqali ta`limiy yutuqqa erishiladi.

Topshiriq berilganda ham she`rni xohlagan baytidan emas, iloji boricha to‘liq yodlatishga da`vat etish lozim. Chunki baytlardagi ma`no-mazmun bir-birini to‘ldirib, oydinlashtirib borgan. Ularda mantiqiy satrlar ham uchraydi. Xususan, 6-baytning uchinchi misrasida *“Nafs ipiga bog‘lidur ruh iplarin uzgan tana”* deyilganda ruhsiz tan - nafs qulidir; o‘z ruhiyatidan (maqsad-vazifasi, burchidan; o‘zligidan) voz kechgan tana faqat tanovul qilish va hordiq chiqarishdan boshqasiga yaramaydi, degan ibrat va hayotirlikni namoyon etgan hikmatni keltirib chiqaradi. Shu kabi har misrasida hikmat yashiringan bu she`rni o‘quvchilarga ma`no-mazmunini turli ko‘rsatmali metodlar bilan yetkazib bera olish ularni ta`sirlantirmay qolmaydi.

Xulosa. Umuman olganda, maktab darsliklaridagi she`r va nasriy asarlarni oddiylikdan murakkablikka tomon yo‘naltirish, guruhlarda ishlash, hayotiy dalillar keltirish orqali qisqa vaqt ichida sifatli ta`lim jarayoni tashkil etish va samarali o‘zlashtirishga erishish mumkin.

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STUDY OF THE CATALYTIC PROPERTIES OF THE SELECTED CATALYST FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT LIQUID SYNTHETIC HYDROCARBONS FROM SYNTHESIS GAS

Abstract: *Nowadays, the production of products that meet environmental requirements is mainly focused on studying the catalytic nature of catalysts in the production of synthetic liquids from gas. In this article, the effect of the selected catalyst preparation method for the production of high-molecular liquid synthetic hydrocarbons from synthesis gas, i.e. a mixture of carbon dioxide and hydrogen, on the composition of the catalyst, the dependence of carbon dioxide conversion on the synthesis temperature, the dependence of methane yield on the synthesis temperature, the dependence of ethane, propane, butane and ethylene, propene, butenes on the synthesis temperature, and the dependence of liquid synthetic hydrocarbons on the synthesis temperature were studied.*

Keywords: *Catalyst, conversion, synthetic hydrocarbons, synthesis gas, methane, carbon monoxide.*

Introduction: In recent years, the demand for high-quality raw materials and fuels has been increasing, and it has become urgent to study the catalytic activity of selected catalysts for the production of high-molecular liquid synthetic hydrocarbons from synthesis gas, i.e. a mixture of carbon dioxide and hydrogen, and to increase product yield. [1]. This method does not pose any difficulties for laboratory tests, which require small amounts of the catalyst for the production of high-molecular liquid synthetic hydrocarbons from synthesis gas, i.e. a mixture of carbon dioxide and hydrogen[2]. The tests were conducted under the following optimal conditions: pressure 0.1 MPa, volume flow rate 100 h-1. The results were compared with the parameters of the sample prepared in 3 passes.

As can be seen in Figure 1, the sample prepared with 3 passes was more active over the entire temperature range - its carbon dioxide conversion was 5-10% higher than that of the other two samples. The samples prepared with 1 and 2 passes were practically indistinguishable from each other in this respect. The temperature dependences of the methane yield for the three samples are shown in Figure 8. In the low temperature range, the methane production was practically the same for all

three samples. Thus, the methane yield was 1 g/m3 of the exhaust gas at 160 °C and 5-6 g/m3 at 180 °C. Only the methane yield of the sample prepared in 1 pass at 200 °C for the production of high molecular weight liquid synthetic hydrocarbons from synthesis gas, i.e. synthesis gas, differed significantly: the methane yield in it was 30 g/m3 compared to 20-22 g/m3 for the other samples [3].

The yields of ethane, propane, butane and ethylene, propene, butenes were practically the same for all three samples of the catalyst selected for the production of high molecular weight liquid synthetic hydrocarbons from synthesis gas, i.e. a mixture of carbon dioxide and hydrogen. At 160 °C, ethane, propane, butane and ethylene, propene, butenes were detected in residual amounts in the exhaust gas. As the temperature increased, the yield gradually increased and at 200 °C was 10-13 g/m3 (Fig. 3). The dependence of the yield of liquid synthetic hydrocarbons on the temperature of the process of obtaining high-molecular liquid synthetic hydrocarbons from carbon dioxide and hydrogen is presented in Figure 4. As a result of experimental studies, it was found that the yield of liquid synthetic hydrocarbons increased with increasing temperature in the process of obtaining high-molecular liquid synthetic hydrocarbons from carbon dioxide and hydrogen and reached a maximum at 190 ° C. At the optimal temperature, the yield of liquid synthetic hydrocarbons was 136, 140, 145 g/m3 of the gas passed through the selected catalysts for obtaining high-molecular liquid synthetic hydrocarbons from synthesis gas prepared by 1, 2 and 3 times absorption, i.e. from a mixture of carbon dioxide and hydrogen [4].

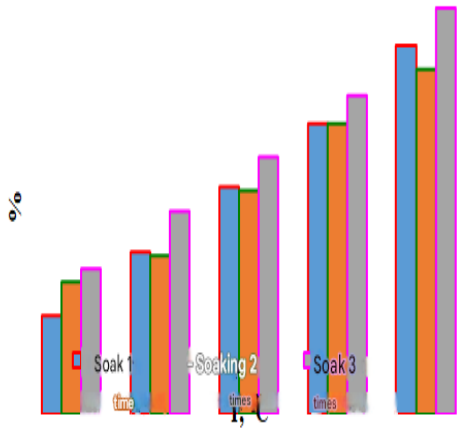

Figure 1. Dependence of CO2 conversion on synthesis temperature

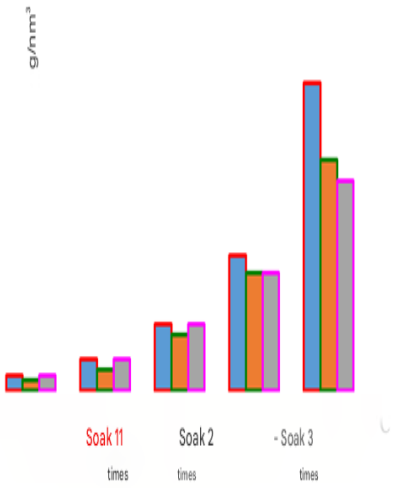

Figure 2. Dependence of methane yield on synthesis temperature

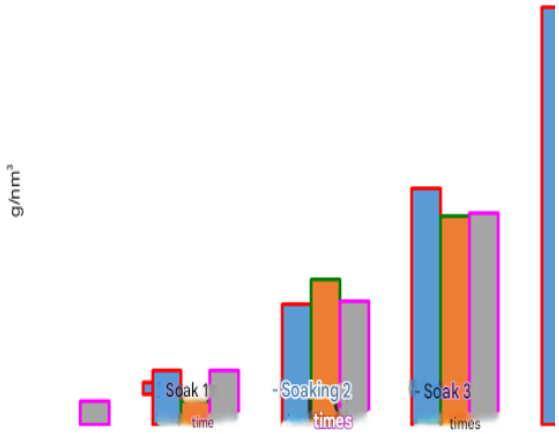

Figure 3. The yield of ethane, propane, butane and ethylene, prop

depends on the synthesis temperature

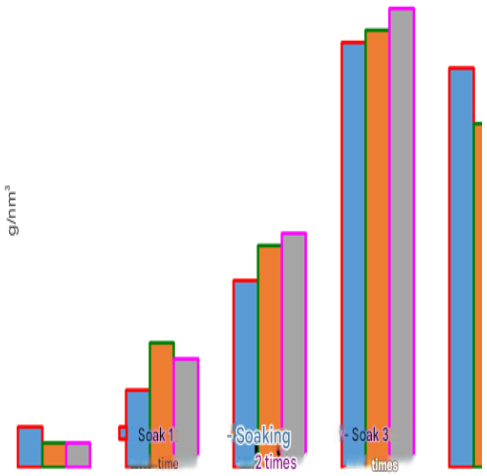

Figure 4. Synthesis temperature of liquid synthetic hydrocarbon

dependence

RESULT: The selectivity for methane formation in the production of high molecular weight liquid synthetic hydrocarbons from carbon monoxide and hydrogen remained almost unchanged, at 6-7% (Table 1).

When the number of passes is reduced, the content of isosaturated hydrocarbons formed in the catalyst almost doubles and reaches 33% in a sample prepared for one pass (Table 2, Figure 1). At the same time, there are no changes in the functionality of the selected catalyst for the production of high molecular weight liquid synthetic hydrocarbons from synthesis gas, i.e., a mixture of carbon monoxide and hydrogen.

Table 1

Effect of the preparation method of the selected catalyst for the production of high molecular weight liquid synthetic hydrocarbons from 15%Co-15%Fe-5%Ni-1%ZrO2/YUKSsynthes-gas on the synthesis performance

Number of wins method	T_{olp} °C	K_{CO}> %	Density, g/m3				S_{CH4} %	S Pentane and higher molecular weight liquid synthetic hydrocarbons %
			CH_4	C_2-C_4	C_{5+}	CO_2		
1 time	190	74	14	10	139	16	8	86
2 times	190	75	12	9	141	14	7	87
3 times	190	81	11	9	147	13	6	88

Table 2

Effect of the preparation method of the selected catalyst for the production of high molecular weight liquid synthetic hydrocarbons from 15%Co-15%Fe-5%Ni-1%ZrO2/YUKS synthesis gas, i.e. a mixture of carbon dioxide and hydrogen, on the composition of the catalyst

Number of wins	Composition of liquid synthetic			Saturated hydrocarbon		
	olefin	n- alkane	i- alkane	C_5—C_{10}	C_{11}-C_{18}	C_{19+}
1 time	9	60	35	64	36	8
2 times	9	64	31	59	35	11
3 times	9	76	19	42	44	19

Thus, simplifying the preparation procedure slightly reduces the activity of the catalyst selected for the production of high molecular weight liquid synthetic hydrocarbons from a mixture of syngas and hydrogen, the yield of the target liquid synthetic hydrocarbons, and the selectivity of their formation. Reducing the number of absorptions increases the isomerization capacity of the 15%Co-15%Fe-5%Ni-1%ZrO2/YUKS catalyst selected for the production of high molecular weight liquid synthetic hydrocarbons from a mixture of syngas and hydrogen, despite the absence of changes in its surface acidity.

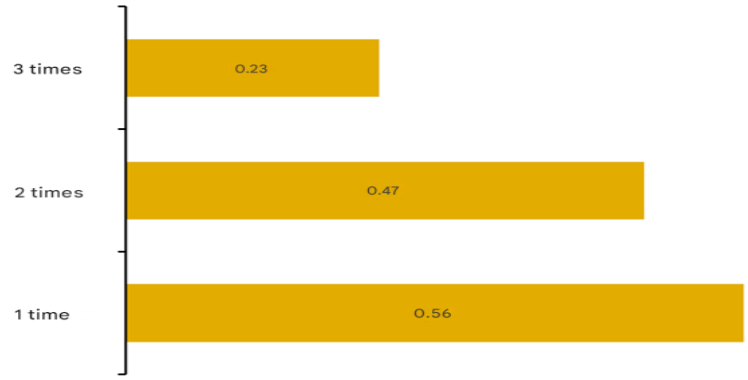

Figure 5. The amount of absorption depends on the ratio of iso/n-saturated hydrocarbons

effect

Conclusion: The results of the research studied the effects of the catalytic activity of the catalyst obtained on the thermodynamics of the process, in particular the dependence of the synthesis temperature on the yield of carbon dioxide, methane, ethane, propane, butane, ethylene, propene, butene, and liquid synthetic hydrocarbons.

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ANALYSIS OF THE PROCESS OF DRYING NATURAL GAS WITH GLYCOLS USING AZEOTROPIC SOLVENTS AND MULTIFUNCTIONAL ADDITIVES

Abstract: *Currently, many gas fields have entered a phase of declining production, which complicates gas preparation in fields, especially in terms of ensuring the quality indicators of natural gas. In order to comply with regulatory requirements for the quality of natural gas supplied to main gas pipelines, it is necessary to improve the calculation, technological and measurement methods for studying the efficiency of gas drying technological equipment. To clarify the thermodynamic methods for calculating the moisture content and dew point temperature for aqueous phases (liquid water, ice and gas hydrate), additional experimental studies of the phase equilibrium in the "natural gas - water - hydrate" system are required. Therefore, the development and improvement of methods for determining the technological parameters of natural gas drying devices is a topical research topic [1]*

Key words: *Azeotrope, solvents, glycols, absorption, contact-regenerative, desorption, degradation, diethylene glycol.*

Introduction: In the gas industry, the contact-regenerative method of drying gas with an absorbent (glycol) is most often used. This process consists of the absorption of moisture by glycol, desorption and recycling of the regenerated glycol. The depth of gas drying largely depends on the residual water concentration in the glycol at the outlet of the desorber. To increase the depth of glycol regeneration, the following are used: increasing the temperature, reducing the pressure, cleaning with dried gas, and introducing a substance that forms an azeotropic mixture with water.

The main disadvantages of absorption drying

• Insufficient depth of water desorption, which reduces the absorption efficiency:

• Glycol foaming in the absorber:

• Corrosion of equipment by acids formed during glycol degradation

• Loss of glycol with water vapor during desorption:

The purpose of this work is to improve the process of deep absorption of natural gas with glycols using an azeotrope-forming agent and surfactants.[2]

In industry, diethylene glycol (DEG) is often used as an adsorbent in the process of hydrocarbon gas absorption, and triethylene glycol (TEG) is used abroad. TEG has a number of advantages compared to DEG: its total losses are 2-2.5 times lower, it causes a higher dew point depression, and its regeneration produces fewer glycol (acid) degradation products due to its higher decomposition temperature. At the same time, the conversion of glycol recovery units from DEG to TEG is complicated, since the temperature for desorption of water from the TAG must be 30-40°C higher, which requires significant capital costs. It is known that the use of azeotrope-forming agents lowers the boiling point of solutions. Thus, the addition of such agents allows the conversion of existing absorption gas drying units from DEG to TAG with minimal material investment, which in turn allows for significant savings in operating costs.[3]

Results: We calculated the boiling point of some hydrocarbon-water mixtures using the Antoine equation. Since the mutual solubility of hydrocarbons and water is less than 0.2%, a model of immiscible components was used for the calculation.[4] The results are presented in Table. 1. As shown below, the boiling point of the “hydrocarbon-water-TEG” mixture almost coincides with the experimental data on the boiling point of the “hydrocarbon-water” mixture. Therefore, TEG does not actually affect the boiling point of the “hydrocarbon-water” azeotropic mixture. From Table. 1 it can be seen that for some components the calculated temperature of the “hydrocarbon-water-TEG” mixture significantly exceeds 100°C.[5]

Comparison of calculated and experimental boiling points of hydrocarbon-water-TEG and hydrocarbon-water mixtures.

Hydrocarbon	Boiling temperature °C		
	Calculation of the “Hydrocarbon-water-TEG” mixture	Calculation of the "hydrocarbon-water" mixture	Literature information on "Hydrocarbon-water"
Pentane	35,7	34,5	34,6
Hexane	67,0	61,6	61,6
Heptane	92,1	79,2	79,2-79,6
Octane	111,1	89,4	89,4-89-6
Dean	132,7	97,5	97,2
Isooctane	92,6	79,3	78,8
Cyclohexane	77,4	69,4	69,5
Benzene	76,9	69,2	69,3
Toluene	101,1	84,4	84,1-84,5
Ethylbenzene	117,0	92,0	89,0-92,0

For example, for decane it was 132.7°C. Our experiments showed that in fact the boiling point of the mixture “n-decane — water — TEG” is in the range of 97-100°C. Thus, the effect of glycol can be neglected when calculating the phase-equal boiling of “hydrocarbon-water” azeotropic mixtures in the presence of TEG.

Of practical interest is a comparative analysis of the amounts of azeotropic solvents required to distill the same amount of water. The results of such calculations are summarized in the table.

Conclusion: Analysis of the efficiency of glycols used in the process of drying hydrocarbon gases showed that triethylene glycol (TEG) has a number of advantages over diethylene glycol (DEG), which makes it a more promising adsorbent on an industrial scale. In particular, the low loss rate, high dew point depression, and thermal stability of TEG make it a viable choice from an energetic and economic perspective. At the same time, the higher temperature required for water desorption from TEG creates certain technological obstacles to its implementation.

Based on the calculations and experimental results, it was found that the boiling point of the “hydrocarbon-water-TEG” mixture is very close to the experimental values known for the “hydrocarbon-water” mixture. This indicates that the presence of TEG does not significantly affect the azeotropic properties of hydrocarbon-water mixtures. Also, the experimental results conducted on the example of the “n-decane-water-TEG” system confirm this theoretical conclusion in practical terms.

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GRAMMAR CHARACTERISTICS OF DIFFERENT PARTS OF SPEECH

Abstract: *This article examines the grammatical categories specific to various parts of speech in the Uzbek language. It explores how different word classes—such as nouns, verbs, adjectives, and others—possess unique grammatical markers that determine their syntactic and morphological roles. The study outlines the functions of categories like tense, aspect, case, number, person, and mood within each lexical group. The analysis is grounded in contemporary Uzbek linguistics and aims to contribute to a deeper understanding of the structure and systematization of grammatical forms.*

Key words: *parts of speech, grammatical categories, word classes, morphology, syntax, noun category, verb category, adjective, case, tense, number, mood, aspect*

In Ancient Greece, issues of grammar did not arise solely from practical necessity but were closely related to logical categories. For example, Plato divided language or speech into two parts: noun (onoma) and verb (rhema). According to Plato's definition, a word about which something is affirmed is considered a noun. In other words, any word used as a subject was classified as a noun. The verb, on the other hand, refers to what is affirmed about the noun. In essence, the term "verb" originally referred to the predicate. Based on this principle, even adjectives functioning as predicates were classified under verbs.

Aristotle (384–322 BCE), the second major philosopher of antiquity, developed a more refined classification of parts of speech based on logical categories. He distinguished words into three main types: nouns, verbs, and connectives (particles). Later, a third group emerged, which also included pronouns and articles.[1]

Ancient Indian grammarians such as Yaska and Panini (5th century BCE) identified four categories of words: nouns, verbs, prefixes/prepositions, and particles/connectives.

In his work *"Russian Grammar"*, Mikhail Lomonosov classified words into eight parts of speech: noun (including nouns, adjectives, numerals), pronoun, verb, participle, adverb, preposition, conjunction, and interjection. In reference to these word categories, the term "parts of speech" (*chasti slova*) was employed. A ten-level classification of parts of speech was developed by the Russian academician V. V. Vinogradov, using the Russian language as a basis. According to this classification, not all words are included among the parts of speech—only those that function as sentence components. Within this system, in addition to the traditional "parts of speech" (*chasti rechi*), the concept of "particles of speech" (*chastitsy rechi*) was introduced, encompassing particles (modal words), copulative particles,

prepositions, and conjunctions. Additionally, special structural-semantic word groups, such as modal and interjectional words, are also considered within this classification.

Academician L. V. Shcherba emphasized that the classification of word classes must be based on morphological, syntactic, and semantic features. He particularly stressed the primacy of semantic characteristics, asserting that the categories of objecthood, action, and quality. This viewpoint represents a promising direction in the study of word classes from a terminological and nominative-onomasiological perspective.

In general linguistics, there exist various approaches to the classification of parts of speech. Several suggestions and considerations have been made in relation to these differing perspectives. According to one scholarly source, *"Word classes are not separate segments of speech, sentence constituents, or different types of words. In this respect, the Russian term 'parts of speech' (chasti rechi) and the Uzbek term 'so'z turkumlari' may appear semantically and conceptually distinct and somewhat limited in scope..."* The same source argues that *"dividing a word into purely lexical and grammatical components by form and content, and then reuniting them into so-called 'lexical-grammatical categories,' is theoretically incorrect."* Instead, it emphasizes the distinction between general grammatical meaning and specific grammatical meaning, and presents the morphological and syntactic features of word classes using relevant examples. Word classes are a real and objective reflection of reality, formed through the continuous process of generalization in human consciousness and thinking. The concept of objecthood, which lies at the core of reality, and the nominative-onomasiological features of naming objects, serve as the basis for this. For example, the Uzbek word *"qishloq"* originally meant "a place for wintering"; *"ovloq"* referred to "a place for hunting"; *"qo'rg'on"* meant "an enclosed place"; *"sharshara"* denoted "a stream that flows with a rushing sound." Similarly, *"ko'kcha," "qizilcha,"* and *"oqqush"* are names of various objects based on their color characteristics.

The concepts of existence that form in the human mind are broad in content, and the nominative-onomasiological aspect of a word only reflects a single perceivable feature—audible, visible, or tangible to a human being. This limited yet specific trait becomes the foundation for naming.

Therefore, the features of word classes—such as objecthood and its attributes (quality, action, quantity and order, state and process), as well as relational meanings expressed in sentences—represent a historically formed social and spiritual product. These features have been passed down from generation to generation, continuously enriched through diverse styles and expressions in languages around the world, including Uzbek. Changes in people's lives and in their worldview, advancements in production, and the growth of material and spiritual culture are all crucial factors that drive linguistic development. For this reason, the traditional classification of word classes, which has been established since ancient times, remains a powerful system that reflects the dynamic demands of social life. It does so through repeated

processes of analogy, comparison, contrast, analysis, and synthesis rooted in reality, human cognition, and the spiritual realm.

The prominent Turkologist and one of the founders of modern Uzbek linguistics, Doctor of Philological Sciences and Professor Ayub Ghulomov, expressed a number of valuable and enduring ideas concerning the classification of word classes.

According to this distinguished scholar, words are classified into word classes based on interconnected morphological, lexical-semantic, and syntactic principles. He states:

"When classifying words into word classes, we rely on all of the above-mentioned features. Therefore, words are grouped into lexical-grammatical categories based on a complex of features. Relying solely on one aspect in this classification process does not correspond to the full nature of words. For instance, if we base our classification only on the semantic feature of expressing a quality, then adjectives and adverbs would fall into the same category…"

In his view, while each of the defining features (morphological, syntactic, and semantic) is important, semantics holds a particular significance: In each word class, words are initially grouped by meaning, and their grammatical meanings are related to that semantic basis. (For example, the noun nature of the word *'og'iz'* [mouth] is recognizable even when taken in isolation)."*[5]

In his grammar studies, Professor A. G'. G'ulomov divides words in the Uzbek language into two main groups: content words and function words. In addition to these, he identifies a separate category comprising modal words, interjections, and onomatopoeic words, which form distinct lexical-grammatical groups.

Among the content words, nouns, adjectives, verbs, and adverbs are considered the most important. For example, numerals express general quantitative meaning on their own, but when combined with nouns, they gain specific meaning: *o'nta* (ten — abstract quantity), *o'nta kitob* (ten books — specific quantity).

Pronouns serve as substitutes and can replace nouns, adjectives, and numerals. Their meanings become clear only in context.

Nouns, adjectives, verbs, and adverbs are classified as open word classes, as they can continuously expand with new units while maintaining structural integrity. These categories occupy core syntactic positions in sentence construction. Among them, nouns stand out as the most dynamic and frequently updated category, sensitive to changes in social and everyday life.

From a functional-semantic perspective, these four categories (noun, adjective, verb, adverb) form the nucleus of the parts of speech system, while function words and others occupy peripheral roles. The constant evolution of relationships among parts of speech reflects the dialectical nature of linguistic units, showing that language, like reality, develops gradually over time. The emergence of parts of speech is closely tied to the historical development of language. In the early stages of human society, nominative units appeared first, followed by syntactic

structures. This process was accompanied by the development of connective and binding elements, such as intonation, agglutination, conjunctions, and particles.

Through these developments, the thematic fields of key parts of speech emerged, contributing to the formation of sentence structure patterns. F. de Saussure referred to such relationships as associative relations — the mention of one word activates a chain of related words in the speaker's mind.

For instance, the word *ko'klam* (spring) evokes various images and concepts associated with that season in the speaker's consciousness. Similarly, the novel title *O'tgan kunlar* (Bygone Days) instantly brings to mind its author Abdulla Qodiriy, characters, and historical context. Such associative relationships create lexical fields, which then form larger macro-fields or thematic categories.

These connections manifest in two main ways:

- Syntagmatic (horizontal) relations — the sequence and combination of words in speech;
- Paradigmatic (vertical) relations — their place and function within the system of language.

Polish-Russian linguist Jan Baudouin de Courtenay identified two core aspects:

1. Horizontal relations (syntagmatics);
2. Vertical relations (paradigmatics).

This framework helps us understand the hierarchical order of linguistic units (phoneme → morpheme → word → phrase → sentence) and the rules of their substitution and combination.

N. V. Krushevsky, a member of the Kazan linguistic school, extended de Courtenay's view by identifying two types of associations:

1. Association by similarity — grouping words based on form or meaning (e.g., *bilim*, *bilamoq*, *bilag'on*);
2. Association by contiguity — grouping words based on their common usage in speech (e.g., *ot — kishnamoq*; *it — hurmoq*).

In contemporary Uzbek, there are frequent transitions between parts of speech: nouns can become adjectives, adjectives can become adverbs, and so on. These processes are known as substantivization, adjectivization, adverbialization, transposition, etc.

Each part of speech is structured through grammatical categories. For example, nouns are characterized by categories such as number, case, and possession. However, not all nouns express possession unless accompanied by a corresponding marker.

According to G'ulomov, a grammatical category is defined as a set of forms expressing a unified grammatical meaning. For instance, all case forms together form the category of case, where each form has its own meaning but functions within a unified system.

Grammatical (morphological) categories consist of grammemes — units that differ in specific meaning but are united by a common semantic core. In the category

of possession, for instance, grammemes include 1st person, 2nd person, 3rd person, singular, and plural.

Morphological categories influence syntax but do not merge with it. For example, predicative categories — such as person, tense, modality, affirmation/negation — form the basis for syntactic organization in utterances.

Professor A. N. Nurmanov emphasizes that although both morphology and syntax belong to grammar, they should not be combined under a single paradigm, since each possesses its own system of models and functions.

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OLIY MATEMATIKA FANINI O‘QITISHDA INTERAKTIV TA’LIM METODLARIDAN FOYDALANISH

Annotatsiya. *Ushbu maqolada aniq integrallarning iqtisodiy mazmunga ega masalalarni yechishda qo‘llanilish imkoniyatlari tahlil qilinadi. Xususan, foiz hisoblari, kapital oqimlarini baholash, diskontlangan daromadlar, rentaning keltirilgan qiymati kabi moliyaviy tushunchalarning matematik ifodalari ko‘rib chiqiladi. Amaliy iqtisodiy masalalarni yechishda oliy matematikadagi nazariy bilimlardan foydalanish orqali dars samaradorligini oshirishning interaktiv ta’lim metodlaridan foydalanish taklif etiladi.*

Kalit so‘zlar. *Oddiy foyiz, foyiz to‘lov, murakkab foyizlar,foyiz stavka, xarajat funksiyasi, diskontlangan daromad, kapital mablag‘*

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THE USE OF INTERACTIVE TEACHING METHODS IN HIGHER MATHEMATICS EDUCATION

Abstract. *This article explores the application of definite integrals in solving problems with economic content. In particular, it examines the mathematical modeling of financial concepts such as interest calculations, capital flow evaluation, discounted income, and the present value of annuities. The use of interactive teaching methods is proposed to enhance lesson effectiveness by applying theoretical knowledge of higher mathematics to practical economic problems.*

Keywords. *Simple foyer, foyer payment, complex foyers, foyer rate, cost function, discounted income, capital funding.*

Menejment, buxgalteriya hisobi va audit kabi sohalar bo‘yicha mutaxassislar tayyorlash jarayonida amaliy matematika va biznes matematikasi fanlarining o‘rni alohida ahamiyat kasb etadi. Ushbu fanlarni o‘qitishda integrallashgan ta’lim texnologiyalaridan foydalanish, shuningdek, dars jarayonida talabalar kasbiy

kompetensiyalarini rivojlantirishga yo‘naltirilgan yondashuvlar yuqori samaradorlikni ta’minlaydi. Mazkur maqola ushbu muammoni hal etishning innovatsion usullaridan birini tahlil qilishga bag‘ishlangan. Ma’lumki, umumta’lim maktablarining matematika kursida foizlar mavzusi o‘rganiladi. Dastlab oddiy foiz tushunchasi, ya’ni sonning berilgan foizini aniqlash, foizga ko‘ra sonning qiymatini topish, ikki son orasidagi foiz nisbatini hisoblash kabi masalalar ko‘rib chiqiladi. Ushbu mavzuni chuqur o‘zlashtirishda quyidagi proporsiya muhim o‘rin egallaydi.

$$K:I = 100:Pt.$$

Bu proporsiya oddiy foyizlarni xarakterlovchi asosiy munosabatdan iborat. Amaliyotda murakkab foyizlar deb yuritiladigan foyizlardan ham foydalaniladi. Bunda esa quyidagi ko‘rinishdagi munosabatdan foydalaniladi:

$$K = K_0 r^n$$

maktab matematika kursida

$$y = x^n, n \in N \quad y = \sqrt[n]{x}$$

funksiyalar o‘rganiladi.Ushbu keltirilgan munosabatlar qanday amaliy mazmunga ega? degan savol tug‘ilishi tabiiy. Moliyaviy operatsiyalarni o‘rganishda foyiz to‘lov tushunchasidan foydalanilib bu uning to‘lov muddati bir yildan kam bo‘lsa

$$I = \frac{KPt}{100}$$

kabi aniqlanishi moliya matematikasi kursidan ma’lumdir. Bundan tashqari amali-yotda to‘lov muddati bir yildan ortiq bo‘lsa ,murakkab foyiz deb ataladigan va quyidagicha

$$K_n = K_o\left(1 + \frac{P}{100}\right)^n$$

bilan aniqlanadigan tushunchadan foydalaniladi. Agar foyiz stavkalar bir yilda bir necha marta hisoblansa

$$K_{nm} = K_o\left(1 + \frac{P}{100m}\right)^{mn}$$

kabi aniqlanadi. Agar davrlari soni m cheksiz ortib borsa har bir davr uzunligi nolga yaqinlashib boradi, ya’ni bu vaqtda quyidagi matematik analizning limit tushunchasiga asoslaniladi

$$K_{nm} = K_o \lim_{m\to\infty}\left(1 + \frac{P}{100m}\right)^{mn} = K_o\left[\lim_{m\to\infty}\left(1 + \frac{P}{100m}\right)\right]^{mn} = K_o e^{in}$$

ko’rinishda yoziladi.Oliy matematika kursida $e^{kx}dx$

$$\int P_n(x)dx, \int_a^b e^{kx}dx, \int f(x)e^{kx}dx, \int_a^b f(x)e^{kx}dx,$$

ko‘rinishdagi integrallarga duch kelamiz. Quyidagi savol tug‘ilishi tabiiy.Bundayintegrallar qanday amaliy(masalan) moliyaviy mazmunga ega?

Bu bilan iqtisod bilan oliy matematikaning integratsiyasi namoyish etiladi.Sh maqsadda bir nechata iqtisodiy tushunchalarni matematik ifodasi qaraladi.Masalan, moliya matematikasidagi rentaning keltirish va yig‘ma koeffitsentlarini topish formulalarini keltirish maqsadga muvofiq.

1-masala.Marginal xarajat funksiyasi berilgan

$$f(x) = 2x^2 - 2x + 90.$$

$F = F(x)$ – xarajat funksiyasini funksiyasini va 15 lona maxsulot ishlab chiqarish narxini hisoblang.

Yechish: integral yordamida biz 15 dona maxsulot ishlab chiqarish xarajatini topamiz

$$\int_0^{15}(2x^2 - 2x + 90)\,dx = \left(\frac{2}{3}x^3 - x^2 + 90x\right)_0^{15} = 3375(to\ var.\ bir).$$

Bu yerda xarajat funksiyasi

$$F(x) = \frac{2}{3}x^3 - x^2 + 90x - C$$

ga teng bo‘ladi. Bular bilan birgalikda

$$\ddot{a} = \int_0^n e^{-kx}dx,\ \ddot{s} = \int_a^b e^{kx}dx,$$

to‘lovlar oqimining joriy bahosi va yig‘ma miqdorini topish formulalarini misol qilib keltirish mumkin:

$$A = \int_0^n f(t)e^{-\delta(n-t)}dt \text{ va } S = \int_0^n f(t)e^{\delta(n-t)}dt.$$

2-masala. 8% li stavka bilan uch yil uchun diskontlangan daromadni aniqlang,agar dastlabki capital mablag‘ 10 mln. So‘mni tashkil etsa va capital mablag‘ yiliga 1 mln. so‘mga ko‘paysa.

Yechish. Ko‘rinib turibdiki, kapital mablag‘ $f(t) = 10 + 1.t = 10 + t$. U holda

formulaga asosan diskontlangan kapital mablag‘ summasi

$$K = \int_0^3 (10 + t)e^{-0,08t}dt = 30,5 \text{ mlrd.}$$

so‘m ekanini olamiz.

Bu esa , uch yilda 10 dan 13 mln so‘mgacha yiliga bir xil o‘suvchi capital mablag‘ summasini topish degani ko‘rsatilgan o‘suvchi stavkada dastlabki 30,5 mln so‘m mablag‘ bilan hisoblash degani ekan.

3-masala. Agar vaqtning sarf funksiyasi $t(x) = 100x^{-0,5}$ (soat) bo‘lsa,$x_1 = 50$ dan $x_2 = 75$ davrda bitta mahsulot yaratish uchun zarur o‘rtacha vaqt topilsin.

Yechish. (1) Formulaga ko‘ra

$$t_{o‘rta} = \frac{1}{x_2 - x_1}\int_{x_1}^{x_2} t(x)dx = \frac{1}{75-50}\int_{50}^{75} 100x^{-0,5}\,dx = 12,7 \text{ (soat)}.$$

Masala. 3 yil muddat uchun 8% yillik stavka asosida diskontlangan daromadni aniqlang, agar dastlabki investitsiya miqdori 10 million so‘mni tashkil etsa va har yili investitsiya 1 million so‘mga oshirilishi rejalashtirilgan bo‘lsa.

Yechim. Ma’lumki, investitsiya miqdori vaqtga bog‘liq holda $f(t) = 10 + 1.t = 10 + t$funksiyasi orqali ifodalanadi, Unda diskontlangan investitsiya quyidagi $K = \int_0^T f(t)e^{-pt}dt$ (milliard so‘mlarda) formula orqali topiladi . Hisob-kitoblarga ko‘ra, natija $K = \int_0^3 (10 + t)e^{-0,08t}dt = 30,5$ milliard so‘mga teng bo‘ladi.

Xulosa. Yuqorida keltirilgan misollar oliy matematikaning iqtisodiy fanlar bilan bevosita bog‘liq ekanini yaqqol ko‘rsatadi. Ayniqsa, ***foizlar, diskont, rentaning hozirgi va yig‘ma qiymati, marginal xarajatlar, vaqt funksiyalari*** kabi tushunchalar orqali talabalar nafaqat nazariy bilimga, balki real iqtisodiy muammolarni matematik modellashtirish ko‘nikmasiga ham ega bo‘ladilar. Bu esa integrallashgan yondashuvning samarali natijalaridan biridir.

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PROBLEMS OF TEACHING TRANSLATION OF PHRAZEOLOGICAL UNITS

Abstract: *The aim of the present paper is to study the linguacultural features of phraseological units of English and Uzbek languages and problems of translation. As a result of experience of comparisons English and Uzbek phraseological units the following ways of translation of phraseological units are distinguished: equivalence-based translation, calque-based translation and descriptive translation.*

Keywords: *Phraseological units, idiom, national-cultural specificity, linguistic and extra linguistic character, reality, component analysis.*

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FRAZEOLOGIZAMLARNI TARJIMA QILISHNI O‘RGATISH MUAMMOLARI

Annotasiya: *ushbu maqolaning maqsadi ingliz va o'zbek tillaridagi frazeologik birliklarning lingva-madaniy xususiyatlarini va tarjimadagi muammolarni o‘rganishdan iborat. Ingliz va o'zbek frazeologik birliklarini taqqoslash tajribasi natijasida frazeologik birliklarni tarjima qilishning quyidagi usullari ajratilgan: ekvivalentlikka asoslangan tarjima, kalka asosidagi tarjima va tasviriy tarjima.*

Kalit so'zlar: *frazeologik birliklar, idioma, milliy-madaniy o'ziga xoslik, lingvistik va ekstralingvistik xarakter, voqelik, komponentlar tahlili.*

Kirish. Xorijiy tillarni jadal o‘rgatish mustaqil O‘zbekistonda hozir umumxalq extiyojiga aylandi va davlat siyosati darajasiga ko‘tarildi. Darhaqiqat, xalqaro hamjamiyatda o‘z o‘rnini topishga intilayotgan mamlakat uchun xorijiy tillarni mukammal bilgan mutaxassislarga ega bo‘lish muhimdir.

Frazeologiya obrazlilikka ega bo‘lgani uchun, nutqni ifodali va ta’sirchan qiladi. Masalan:

Ingliz tilida: As gentle as a lamb, To fight like a lion , Who keeps company with the wolf, will learn how to howl, Like a fish out of water, Old bird

O‘zbek tilida: Qo‘ydek yuvosh, Sherdek olishmoq, Qozonga yaqin yursang qorasi yuqadi, Xumga tushgan aridek, Qari tulki.

Frazeologiyani o‘rgatishga bag‘ishlangan ishlar talaygina. Lekin ular alohida harakterga egadirlar. Ular: I.Dubinskiy frazeologizmlarni nutqda ishlatilishga; (1) A.Kudakayeva ruscha frazeologizmlarni sintaktik vazifalarini hisobga olgan holda maktabda o‘rgatishga; (2) N.Saparova rus tilidagi maqollarni nomenatsentrik hususiyatlarini kozoqlarga o‘rgatishga; (3) N.Amosovaning Ingliz tilidagi frazelogizmlariga; G.Gazarovaning lug‘at tarkibidagi frazeologizmlarni stilistik tomondan ingliz va o‘zbek tillari misolida ko‘rib chiqishga; M.Xudoyberganovaning holat ma’nosini bildiruvchi ingliz tildagi fe’lli frazeologik iboralarni va ularning o‘zbek tilidagi nutqiy mosligini ko‘rib chiqishga; Sh.Raxmatullayev o‘zbek tilidagi frazeologik birliklarni xususiyatlarini o‘rganishga bag‘ishlangan kabi tadqiqot ishlarni ko‘rsatish mumkin.

Talabalarga tarjima qilishni o‘rgatish vaqtida turli xil muammolar yuzaga keladi, ulardan biri frazeologik iboralarini trajima qilish muammosidir. Frazeologik birliklar tabiatiga ko‘ra juda murakkab vosita xisoblanadi, ularni tarjima qilishda – ularning leksik, semantik va tuzilish jihatlarini ham hisobga olish darkor. Buning ustiga, bir talay frazeologizmlar milliy xususiyatga egadirlar, bu hol esa tarjimonlar oldiga qator amaliy qiyinchiliklarni ko‘ndalang qilib qo‘yadi. Frazeologik birliklarni tarjimada adekvat to‘g‘ridan to‘g‘ri talqin etish tarjima amaliyotinig ma’suliyatli masalalaridan biri hisoblanadi. Adekvat talqin etish bu ingliz va o‘zbek tillarida frazeologik birikmalarning ma’nolarini ikki tilda to‘liq mos kelganida so‘zma-so‘z tarjima qilishdir.. Masalan: Uni quyidagicha mos qilib ko‘rsatishimiz mumkin.

Sovuq urush – Cold war

Ochiq qo’l – An open hand

Bunday iboralarni tarjima qilish vaqtida talabalar hech qanday qiyinchilikka uchramaydilar, lekin milliy-madaniy xususiyatni bildiruvchi frazeologizmlarni tarjima qilishda katta qiyinchilikga duch keladilar. Turli geografik nomlar ham frazeologik birliklar komponentlari vazifasini bajarishi mumkin.

O‘zbek tilida: «Onasini uchqo‘rg‘ondan ko‘rsatmoq»

Ingliz tilida: “Do in Rome as the Romans do”

Frazeologizmlar milliy-madaniy xususiyatga egadir, har bir xalqning urf-odatlari va an’analari, ular tomonidan qabul qilingan axloqiy me’yorlar har xildir, shuningdek, tarkibida kiyim-kechak va iste’mol qilinadigan taomlar nomlari ham milliy xususiyatga egadir. Bunday frazeologizmlarning obrazliligi ularning taqiqlanganliklaridadir. Bunday paytlarda tarjimondan chuqur bilim talab qilinadi, u nafaqat tilni balki tarjima qilayotgan tilning milliy xususiyatlarni ham bilishi kerak. Masalan: baqa go‘shtidan tayyorlangan taom fransuzlarning eng lazzatli taomi bo‘lsa, xitoyliklar bunday fazilatni ilon gushtiga berishadi. Qadimda rus xalqi ot gushtini yemagan bo‘lsa, musulmonlar cho‘chqa go‘shtini iste’mol qilmaydilar.

Mol go‘shti dunyoning hamma xalqlari istemol qiladi, lekin xindlar yemaydilar, chunki sigirlar ular tasavvurida muqaddas hayvon sanaladi. Masalan:

O‘zbek tilida: “Noma’lum buzokning gushtini yemok.”

Ingliz tilida: “Milch cow”, “sacred cow”

Talabalarga qanday o‘rgatish mumkinligini bir misol tariqasida keltiramiz, ingliz tilidan o‘zbek tiliga frazeologizmlarni tarjimasini talabalarga o‘rgatishdan oldin frazeologik birikma nima deganini tushuntirib o‘tish darkor, shundan so‘ng frazeologik iboralarni tarjima qilish vaqtida ularning milliy-madaniy xususiyatlariga e’tibor berish kerakligi aytiladi, agar talaba o‘zga xalqning milliy-madaniy xususiyatlarini bilmasa frazeologik iboralarni ham to‘g‘ri tarjima qila olmaysligini aytiladi. «Qo‘y og‘zidan cho‘p olmagan» o‘zbek tilidagi iborasini oladigan bo‘lsak, ya’ni nihoyat daradjada “beozor”, “mo‘min” degan ma’no kelib chiqadi. Misol keltirsak, “Nazarimda, qadam olishi, turqi-tarovati Narziqulga o‘xshaydi”. – “Yo‘q-e! Qo‘y og‘zidan cho‘p olmagan bola-ya! Yanglishayotgandirsiz“. Said Ahmad, Hukm.

Yoki shu iborani o‘zbek tilida boshqa bir necha hayvon nomi qatnashgan so‘z bilan ham berish mumkin. “Pashshaga ham ozor bermaydi”, “Musichadek beozor” iboralari bilan berish mumkin. Biroq shu iborani ingliz tiliga tarjimasi faqatgina bir hayvon nomini keltirish bilan ifodalanadi, not to be able to say 'boo‘ to a goose. Talaba to‘g‘ri tarjima qilishi uchun shu millatning milliy-madaniy xususiyatlarini bilishi kerab bo‘ladi. Agar ingliz tilidan o‘zbek tiliga tarjima vaqtida tarjimon ingliz tiladgi goose. So‘zi o‘zbek tilida qo‘y yoki musicha so‘zlari bilan mos kelishini bilmasa noto‘g‘ri tarjima paydo bo‘ladi. To‘g‘ri tarjima qilishni o‘rgatish metodi bir usul hisoblanadi.

Turli xalqlarning madaniyati va urf-odatlari, an’analari turlicha bo‘lganligi sababli, frazeologizmlari ham o‘ziga xos milliy harakterga ega.

Ingliz va o‘zbek tilidagi frazeologizmlar orqali tillararo moslikni, frazeologizmlarning milliy-madaniy o‘ziga xos xususiyatini aniqlash va frazeologizmlarni tarjima qilishni o‘rgatish bizning asosiy maqsadir.

Frazeologik iboralarni tarjima qilishni usullarini ishlab chiqish va qo‘llashni o‘rgatish masalasi zarur deb hisoblaymiz, chunki frazeologizmlarni to‘g‘ri tarjima qila olish ham san’atdir. Masalan talabaga snake in the grass iborasining o‘zbek tilidagi adekvat trajimasini toping degan topshiriq beriladi, u o‘z bilagincha tarjima qiladi, o‘tning ustidagi ilon deb tarjima qiladi, natijada boshqa odam bu gapni butunlay boshqacha tushunish mumkin, lekni o‘zbek tilidagi to‘g‘ri tarjimasi ilonnining yog‘ini yalagan iborasi bilan beriladi. Talabalarga shunga o‘xshash ir qancha misollar beriladi va talabar ingliz tilidan o‘zbek tiliga yoki o‘zbek tilidan ingliz tiliga tarjima qilib ko‘radi, o‘qituvchi hamma talabalarning tarjimalarini tekshirib chiqib, ularning qilgan xatoliklarini tuzatib yana qaytadan bunday mashg‘ulot o‘tkazishi mumkin. O‘qituvchi darslarini yaxshi o‘tkazish maqsadida, programmalar, darsliklar, qo‘llanmalarni tahlil qilish, frazeologizmlarni yaxshi o‘zlashtirish uchun mashqlari sistemasini ishlab chiqishi kabi masalalarni amalga oshirishni o‘z oldiga maqsad qilib qo‘yadi..

Hozirgi kunda inglizcha frazeologizmlarni sintaktik vazifalarini hisobga olgan holda o‘rgatish yo‘llari tadqiq qilinyapti. Frazeologizmlarni darsga tadqiq qilish to‘g‘risida olib borilgan ishlar sanoqlidir. (3,4,8)

Hulosa qiladigan bo’lsak hozirgi kunda metodik tomondan alohida frazeologizmlarni o‘rgatish uchun mashqlar sistemasi ishlab chiqish kerak va dasturlarga kiritilsa yahshi bo’lar edi. Kelajakda frazeologizmlarni o‘zbek tilidan ingliz tiliga tarjima qilishdagi muammolar bo’yicha saytlar va mobil qurilmalar uchun appslar yaratish kerak.

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NATIONAL-CULTURAL FEATURES OF PHRASEOLOGICAL UNITS IN ENGLISH AND UZBEK LANGUAGES

Abstract: *The aim of the present paper is to study the linguacultural features of phraseological units of English and Uzbek languages. The national-cultural specificity of phraseological units with the names of animals, geographical names, historical terms, national clothing, names of plants, colors which is opened is caused by the factors linguistic and extra linguistic character. As a result of experience of comparisons English and Uzbek phraseological units the following ways of translation of phraseological units are distinguished: equivalence-based translation, calque-based translation and descriptive translation.*

Keywords: *Phraseological units, idiom, national-cultural specificity, linguistic and extra linguistic character, reality, component analysis.*

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INGLIZ VA O'ZBEK TILLARIDAGI FRAZEOLOGIK BIRLIKLARNING MILLIY-MADANIY XUSUSIYATLARI

Annotasiya: *ushbu maqolaning maqsadi ingliz va o'zbek tillaridagi frazeologik birliklarning lingva-madaniy xususiyatlarini o'rganishdan iborat. Hayvonlarning nomlari, geografik nomlari, tarixiy atamalari, milliy kiyimlari, o'simliklarning nomlari, ranglari bilan frazeologik birliklarning milliy-madaniy o'ziga xosligi bilan belgilanadi. Ingliz va o'zbek frazeologik birliklarini taqqoslash tajribasi natijasida frazeologik birliklarni tarjima qilishning quyidagi usullari ajratilgan: ekvivalentlikka asoslangan tarjima, kalka asosidagi tarjima va tasviriy tarjima.*

Kalit so'zlar: *frazeologik birliklar, idioma, milliy-madaniy o'ziga xoslik, lingvistik va ekstralingvistik xarakter, voqelik, komponentlar tahlili.*

Introduction. The modern world is rapidly entering the era of globalization, which not only affects the economic environment, but also manifests itself violently in the way of life of every person. This creates active contacts with speakers of other

cultures and other languages in everyday life and professional life. Well, now, even a very good knowledge of the language does not arouse suspicion in anyone that it does not lead to like-minded people without understanding the culture of speakers of that language, to understanding one another.

In order to achieve success in intercultural communication, in order to get your partner to understand his thoughts well, you will have to lead a connection, or a conversation, not based on your culture, but on his culture. The most fundamental mistake in communicating with representatives of other peoples is that, based on its culture, it consists in not only understanding or not understanding the characters of representatives of other cultures. Therefore, the main goal of studying the culture and lifestyle of other peoples is to understand and recognize the worldview and culture of representatives of other peoples, and, this helps to create a communicative connection. In the people, the National worldview is formed on the basis of historical and cultural factors, and at the last moment economic factors are also taking their toll. By the national-cultural worldview, we can cite phraseologisms as an example, since phraseologisms also denote national-cultural characteristics and serve to establish intercultural dialogue. Currently, there is a growing interest in phraseologisms. A.V. Kunin studied phraseologisms in English from all sides and gave such a definition to phraseologisms. "A phrase whose meaning does not come from the content of the words contained in the same phrase is called an idiomatic phrase" (A.V. Kunin,1934). From this comes the conclusion that if we take separately the meaning of the words contained in one phrase, another meaning comes out. A similar definition of a phraseological phrase is given by Sh. Rahmatullaev also cited the following. "Phraseological unity arises on the basis of the inherent opposition and unity of the plan of content with the plan of expression" (Sh.Rahmatullaev, 1978). Z.M.Ma'rufov's Explanatory Dictionary of the Uzbek language gives the following definition of a phraseological phrase. "Phraseological phrase is a compound consisting of several words that make up a whole in meaning" (Z.M.Marufov, 1981).

From these given definitions, let's analyze using an example. For example: the English proverb "*It is the last straw that breaks the camels back"* translated into Uzbek word by word in the following way "*bu oxirgi bugdoy qaysiki tuyaning orqasini sindiradi" but it is wrong translation.* The English word *"straw" translated into Uzbek as "bugdoy"- "wheat".*

It follows that when translating a proverb word by word, a completely different meaning came from it, which cannot reveal the meaning of the proverb, the correct translation into Uzbek as "the cup of patience is full" - *"sabr kosasi tuldi", "sabr toqati toq buldi"*. This phraseological unit in English and Uzbek does not fit on the structural, stylistic and lexical side but fits on the semantic side. On the lexical and structural side, the number of words in an English language is high, but in an Uzbek language it is made up of three words. When translating phraseologisms in English and Uzbek, a great skill is required from the translator.

"In the broadest sense, when translating phraseologisms from one language to another, in any case, their figurative base of support is precisely the options that

correspond to turn to the know, which can lead to the fact that a phenomenon of spiritual shift occurs to a change in meaning" (G'.Salomov, 1983). In my opinion, what is required of us when we translate is to look for an alternative to phraseologism that is as accurate as possible in the translation process, closer to the original meaning. We will consider the difficulties encountered in translating phraseologisms in English into Uzbek languages.

"Even if we define commonality in life experiences, the figurative thinking of the people turns out to be inherently independent and unrepeatable, and they can be transformed into phraseologisms, seeing a level of comparison that is sometimes surprised by other people's representatives, and we can consider phraseologisms as something that all reflect each people's own (L.F.Mironyuk, 1971). In my opinion, phraseologisms are the sum of figurative and wise, beautifully expressed expressions of thoughts derived from the experiences that each people have accumulated during their lives. It turns out that phraseology is a wonderful phenomenon, because phraseologisms are something that is characteristic of all languages of the world. Nevertheless, in each language it has its own forms of expression, forms. We can explain this phenomenon by the fact that extralinguistic factors influence the structure of phraseologisms. Extralinguistic factors are understood as the sum of factors that will be of great importance in the development and formation of social, economic, cultural, and other extralinguistic conditions, conditions of functional and internal structural development of language, phraseological expressions, causing them to indicate their national character. Both in English and in Uzbek, most phraseologisms express the lifestyle, traditions, customs of the people directly or indirectly their national characteristics. Extralinguistic factors have a great influence on the translation of English phraseologism into Uzbek. From extra-linguistic factors, we will select and analyze phraseologisms in English and Uzbek that have a national-cultural feature. Because the cultures and customs, traditions of different peoples are different, their phraseologisms also have their own national character.

National-cultural peculiarities of phraseologisms, national customs of peoples and national worldviews are reflected by Geographical Names, historical-cultural terms, colors, national costumes, plant and animal names.

Geographical names: to carry coals to Newcastle, to carry owls to Athens – daryo buyida Kuduk Kazima (uzb); Rome was not built in a day – Musilmonchilik-astakhilik (uzb); Build castle in Spain –suvga suyanmok (uzb); sayaga karab bui ulchamok (uzb); from Dan to Beerseba – ashrikdan mashrikgacha (uzb); shaharning u boshidan bu boshigacha (uzb); do in Rome as the Romans do – Kozonga yakin yursang, korasi yukadi (uzb); when Ethiopian changes his skin –tuyaning dumi erga tekkanda) (uzb);

Historical and culture of terms: the Lower Empire – the Eastern Roman Empire; The war of Roses – atirgullar urushi (the war between Lancasters and Yorks in XV century) [Lancasterlar gerbida Kizil atirgul, Yorklar gerbida oq atirgul bulgan]; The Black Prince –Qora shahzoda [the son of Edward III (1330-1376),

wear a hat]; The Heart of Mid-Lothian – Edinburgh Prison, Middle Latans heart. (1817 Edinburgh Prison nickname); The Black Death – Qora o'lim;

Colours: as black as sin – ichiga Chirak Yoxa yorishmaidi; prove that black is white and white is black-qorani oq demoq; as white as a sheet (death) - dokadek oqarib ketgan; there is a black sheep in every flock - el-ugrisiz bulmas, to'qay burisiz;

Names of plants: as red as a cherry –olmadek q'izil; pigeon's milk –ankoning urug'i; little strokes fell Great Oaks – Kichkina demang bizni, kutarib uramiz sizni; a tree is known by its Fruit – darahtiga ko'ra -mevasi; the apple of one's eye – ko'zining oqu qorasi; Dead Sea Apple (Fruit) –usti yaltiroq, ichi qaltiroq; as sweat as a nut- asaldek shirin; he is as limp as a rag - behidek sargayib, ipakdek ingichka tortib qolipti.

Animal names: that's a horse of another color – bu boshqa gap edi; tread on a warm and it will turn – baqani bossang ham "vaq" etadi; as strong as a horse – fildek baquvvat; don't make a mountain of a molehill – pashadan fil yasamoq; old cat –qari tulki; like a cat on hot breaks – oyogi kuygan tovukdek pitirlaydi; cat and dog life – it mushuk bulib yashash; a dog in the manger – birovga bersam, essiz oshim, uyda tursa, sasir oshim; it is ill to wake Sleeping Dogs – ypiq qozon yopikligicha kolaversin; Honey is sweet, but the bee stings – ari zahrini chekmagan, bol qadrini bilmas; to kill the goose that lays the golden eggs – tovuqni esang, bir eqsan, kuhumini esang, ming eysan; every bird likes its own nest best-baqa botqogin qumsar, balyq kulini;

National dresses: to fit like a glove – uzukka ko'z quygandek; give someone a back-cap – sirini ochmoq; Sunday best – bayram kastumi; gipsy hay – keng poholli shlyapa; to throw up one's cap – do'ppisini osmonga otmoq; it is not the gay coat that makes the gentleman –husniga boqma, aqliga boq; don't tell tales out of school – bosch erilsa - duppi ostida, qo'l sinsa - yeng ichida;

From the analyzes we have done, we have divided phraseologisms according to their national-cultural peculiarities in English and Uzbek phraseological expressions that are most used. The most commonly used in English and Uzbek are the phraseological units in which the names of the fauna and flora are represented, as well as the phraseological units in which the colors are represented.

Let's analyze the translation of phraseologisms of a national-cultural specifics in English and Uzbek languages.

For example, we translate the English phrase *When pigs fly* Into Uzbek, as we know, literally when pigs fly, but the correct translation of this phrase is translated as *when a camel's tail touches the ground-tuyani dumi erga tekkanda*. Such a translation is called a nonequivalent translation. Analyzing the translation of these phraseological units, one can see that they are structurally and stylistically incompatible. English is characterized by a low number of words, while Uzbek is characterized by a large number of words and suffixes.

If we translate the phrase *Tread on a warm and it will turn* into Uzbek literally, but the correct translation will be Baqani bossang ha "vaq" etadi. Therefore, in order to correctly translate an English phrase, it will also be necessary to know the animal

planet and takes into account the geographical environment of that people. Because, in the English animal world, the word *pig* is used a lot, and in Uzbek language the word *camel* is used a lot, we may not even understand the phrases they use because, they do not have a camel animal. If we translate the Uzbek phrase "*Olmaday qizil"* into English "*as red as an apple*", English speakers may not understand, the correct translation of the phrase is "*as red as a cherry*". If we translate the Uzbek phrase "*as strong as an elephant*" into English, the correct translation of this phrase "*as strong as a horse*", which means that in the English the symbol of strength fell on the *horse*, not on the *elephant*.

When we translate the English phrase *Rome was not built in a day* into Uzbek, the correct translation of this phrase in Uzbek is translated as *Musulmonchilik-astachilik*. Such a translation is called an equivalent translation. The English translation of the Uzbek phrase *"Xursandlikdan do'ppisini osmonga otmoq" into* English "To throw up one's cap". There is also difficulty in translating the English phrase "*To fit like a glove"* into Uzbek, the correct translation "uzukka ko'z qo'ygandek" mos.

According to V.S.Vinogradov, proverbs of the same type do not have completely corresponding sides in another language, there are synonymic variants in the same (V.S.Vinogradov,1974). If we believe that the task of translation is to show the information developed in this – another language in its entirety through one language, then the proverbs show variability, which is called adequate translation. "The material being, which is the same for all mankind, embodies the concepts that are also in lexical units, determining the linguistic correspondence" (V.S. Vinogradov, 1974).

So, when teaching phraseologisms to translate, we need to take into account extra-linguistic factors. In the process of translation, we are required to study not only the wealth of the language, but also the national-cultural sides of the same people and teach how to translate correctly. The influence of extra-linguistic factors is great in teaching the translation of phraseologisms in English. As noted at the beginning of the translation, the translator cannot correctly translate the lifestyle, traditions, customs of that nation (English speakers) without knowing the national-cultural characteristics. To do this, it is necessary to study all the information about that nationality.

The national-cultural specifics of phraseological units with animal names are determined by linguistic and extralinguistic factors. The linguistic basis of the national-cultural specificity of phraseological units with animal names is made up of the mismatch or partial coincidence of their figurative structures, which in turn is due to the peculiarities of phrase-forming processes that occur when forming the figurative meaning in phraseological units with animal names, where the source of motivation for the figurative meanings of phraseological units with animal names is the figurative meaning of words with animal names (Azizova F. 2020).

The translation of phraseological units, especially the translation of figurative expressive combinations, presents many difficulties. This is explained by the fact that many of them include beautiful, emotion-rich expressions, phraseological units

that have a clear oratory style and often represent a national character. When translating stagnant compounds, it is necessary to take into account the features of the context. A characteristic of phraseological compounds in English is the fact that phraseological units in English have pluralistic and stylistic features, which cause difficulties in their translation.

According to translators, phraseological units are divided into two groups: phraseological units, phraseological units that have an equivalent in the language being translated, and those that do not have an equivalent.

Divided into fully and partially corresponding equivalents. Fully compatible equivalents, which are equivalents such that, in terms of meaning with phraseologisms in English, the lexical composition, figurativeness, stylistic orientation and grammatical structure of words are fully consistent. There is not much compatibility in this aspect. This group is based on phraseological expressions, historical factors and geographical factor, which have an international character.

Partial matching equivalents, which are equivalents such that phraseologisms in English are meaningful, but there are lexical, grammatical, or lexical-grammatical differences. Therefore, the partial matching equivalent corresponds to the full equivalent by the adequacy. But, it should be noted that despite the fact that there is a complete and partial correspondence, phraseological expressions have to be translated precisely, literally. For example, in phraseologisms, the image that is hidden is difficult or impossible to understand the texture, replacing them with another image is difficult to understand the meaning of the context, their figurative properties are lost.

Many English-language phraseological units do not have their equivalent in Uzbek. It is mainly phraseological phrases in which National features of the Uzbek language are hidden. In the translation of such phraseological phrases, methods of calcareous and pictorial translation were used. The Kalka method tries to convey to Uzbek-speaking readers the main image of the phraseologism of the English language, in which such a figurative expression cannot be revealed when using other words.

In addition to the calque method, descriptive translation is also used, which is such a translation that it will be necessary to translate phraseological units in simple words. It is considered convenient in the translation of phraseological units, which are mainly terminological in nature. Such a translation method is used when making the meaning complete and clear. When translating a phraseological unit at all times, the first thing to do is to choose a such units which coincides to the meaning of the context.

In conclusion, the translation of phraseologisms is a hard work, there are no ready-made rules or recipes for translating phraseologisms. Therefore, phraseologisms should be thoroughly analyzed and selected thoroughly. Nowadays, scientific research methods are investigating in Uzbekistan. Different kind of dictionaries are being created for translators and recommended to the reader this will make the work of translators much easier.

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ETIOLOGY, EPIDEMIOLOGY AND PATHOGENESIS OF VIRAL HEPATITIS DELTA

Abstract. *Hepatitis D virus (HDV) infection is a severe and unique form of viral hepatitis that requires the presence of hepatitis B virus (HBV) for replication. This article provides a comprehensive overview of the etiology, global epidemiology, and pathogenesis of HDV. HDV co-infection and superinfection are associated with faster progression to cirrhosis and liver failure compared to HBV mono-infection. The mechanisms of liver injury in HDV infection, including immune-mediated cytotoxicity and direct viral effects, are also discussed. Understanding these aspects is critical for developing targeted interventions and control strategies.*

Keywords: *Hepatitis D virus, HBV, co-infection, superinfection, epidemiology, pathogenesis, liver cirrhosis.*

Introduction. Hepatitis D virus (HDV), also known as delta virus, is a defective RNA virus that requires the helper function of HBV to propagate. First discovered in the 1970s, HDV is responsible for the most severe form of viral hepatitis in humans [1]. Despite advances in vaccination against HBV, HDV continues to pose a public health threat, particularly in endemic regions.

Etiology of Hepatitis D. Hepatitis D virus (HDV), also known as delta virus, is a defective RNA virus that requires the hepatitis B virus (HBV) for its replication and transmission. HDV contains a small, circular, single-stranded RNA genome, surrounded by a delta antigen (HDAg) and a lipoprotein envelope derived from HBV surface antigens (HBsAg) [1].

Due to its incomplete structure, HDV cannot propagate independently and relies entirely on the helper function of HBV, particularly the HBsAg, to infect hepatocytes and assemble new virions [2].

There are at least 8 genotypes (HDV-1 to HDV-8), with HDV-1 being the most globally distributed and associated with both severe and mild forms of liver disease. HDV-3, mainly found in South America, is linked to fulminant hepatitis, while other genotypes show varying degrees of pathogenicity and geographic restriction [3].

Epidemiology. The global prevalence of hepatitis D is estimated at 12–20 million people, though accurate numbers are limited due to underdiagnosis and lack of routine testing [4]. The disease is endemic in regions like Central Asia, Africa, Eastern Europe, and the Amazon Basin, where HBV is also highly prevalent.

In Eastern Europe and Central Asia, co-infection with HDV can affect up to 30% of HBV-positive individuals [5,8].

In developed countries, the prevalence has declined due to successful HBV vaccination, but remains significant among high-risk groups such as intravenous drug users, migrants from endemic regions, and patients co-infected with HIV [6].

Transmission of HDV mirrors that of HBV — via blood and bodily fluids, through parenteral exposure, sexual contact, and vertical transmission (though the latter is less common) [3, 5].

Two main patterns of infection are observed:

Co-infection (simultaneous HBV and HDV infection), usually self-limited but occasionally severe.

Superinfection (HDV infection in a chronic HBV carrier), which often leads to chronic HDV infection and progressive liver disease.

Pathogenesis of HDV Infection.

The pathogenesis of HDV is unique and more severe than HBV alone. HDV causes direct cytopathic effects, unlike HBV, which primarily induces immune-mediated liver damage [7,9]. HDV replication occurs in the nucleus of infected hepatocytes, where the HDAg interacts with host RNA polymerase II to produce viral RNA.

The large form of HDAg (L-HDAg) inhibits replication and facilitates virion assembly, while the small form (S-HDAg) promotes genome replication. The balance between these isoforms influences the course of infection and severity of liver injury [2,10].

HDV induces a strong innate and adaptive immune response, but chronic infection can result in persistent inflammation, hepatocyte apoptosis, fibrosis, and ultimately cirrhosis. Compared to HBV monoinfection, HDV superinfection is associated with:

Faster fibrosis progression,

Higher rates of hepatic decompensation,

Increased risk of hepatocellular carcinoma (HCC) [1, 4,11].

Conclusion

Hepatitis D represents a significant clinical and public health challenge due to its aggressive course and limited therapeutic options. A better understanding of its etiology, epidemiology, and pathogenesis is essential for improving prevention, diagnosis, and management strategies. HDV screening among HBV-infected individuals is crucial, particularly in high-risk populations and endemic areas.

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YOG‘OCH TOLALI PLITALAR ISHLAB CHIQARISH TEXNOLOGIYASI

Annotatsiya: *Ushbu maqolada yog‘och tolali plitalar ishlab chiqarish texnologiyasi ko`rib chiqilgan va tahlil qilingan.*

Kalit so’zlari: *yog‘och tolali plitalar, sopol toshlar, ichi g’ovakli g’isht, yengil g’isht.*

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TECHNOLOGY FOR MANUFACTURING WOOD FIBERBOARDS

Annotation: *This article reviews and analyzes the technology for producing fiberboard.*

Key words: *wood fiber boards, ceramic stones, porous bricks, lightweight bricks.*

Turlari va xususiyatlari. Yog’och qirindili plitalar maxsus tayyorlangan yog’och qirindisiga sintetik smola qo‘shib, issiq presslash yo‘li bilan olingan yirik o‘lchamli yassi plitalardir.

Yog’och qirindili plitalar bir qatlamli va ko‘p qatlamli, bir butun va ko‘p bo‘shliqli bo‘ladi. Bir qatlamli plitalar butun plita qalinligida bir xil shakldagi qirindilardan tashkil topgan. Ko‘p qatlamli, odatda uch qatlamli plitalar qalinligi bo‘yicha qirindilarning uch qatlami-o‘rtadagi va ikki yuza qatlamga ega. O‘rtadagi qatlam nisbatan yirik, ko‘pincha har xil yog’och jinslardan olingan va shakli hamda rangi bo‘yicha turlicha qirindilardan tashkil topgan. Yuza qatlamlar qalinligi bo‘yicha bir xil yassi ingichka qirindilardan tayyorlanadi. Quyidagi 27-rasmda bir qatlamli, uch qatlamli va ko‘p bo‘shliqli plitalarning tuzilish sxema tarzida ifodalangan.

Yog’och qirindili plitalar nomenklaturasi bo‘yicha, plitalar hajmiy og‘irligi 250 dan 400 kg/m3 gacha bo‘lgan yengil, 400 dan 800 kg/m3 gacha bo‘lgan yarim og‘ir va 800 dan 1200 kg/m3 bo‘lgan og‘ir plitalarga bo‘linadi.

Yurtimizda yog’och qirindili plitalar isiqlik izolyasiyasi uchun kam ishlatiladi, ularni asosan devorlar bezagi, shiftlar qoplamasi, pollar to‘shamasi uchun, hamda qurilgan va oddiy mebellar tayyorlash uchun ishlatiladi. Plitalar yuzasini bezalishiga ko‘ra, qoplangan va qoplanmagan bo‘lishi mumkin. Plitalarni qoplash uchun shpon, qog‘oz yoki qatlamli plastik ishlatiladi, unga ko‘ra plitalar chiroyli tashqi ko‘rinishi va yuqori mustahkamlikka ega bo‘ladi.

Xom ashyo materiallari. Yog'och qirindili plitalarni tayyorlash uchun ikkita asosiy xom ashyo turi zarur: Yog'och va bog'lovchi modda sifatida sintetik smola ishlatiladi. Plitalarning xususiyatini yaxshilash uchun, asosiy aralashmaga ozgina miqdorda qo'shiluvchi gidrofobizatorlar, antiseptik va antipirenlar kerak.

Yog'och qirindisini qayin, dub, buk, qarag'ay (sosna), archa (el) va boshqa bargli va ignabargli daraxt yog'ochlaridan tayyordash mumkin.

Qattiq va og'ir daraxtlardan, yengilroq va yumshoq daraxtlarga qaraganda, kam mustahkamligi va zichligi kam bo'lgan plitalar olinadi.

Qirindiga aylantirish uchun turli ko'rinishdagi noishchi yog'och, qisqa va uzun yog'ochlar, va yog'ochni qayta ishlash chiqindilari – gorbil, qirqindi, reykalarni ishlatilish mumkin.

Xom ashyo materiallari.Plitalar ishlab chiqarish uchun xom ashyo sifatida turli yog'och, ayrim qishloq xo'jalik ekinlarining poyalari: bug'doy, g'o'za, kanop va boshqalar xizmat qilishi mumkin. Plitalar ishlab chiqarish uchun asosiy xom ashyo resurslari quyidagilar:

a) noishchi yog'och, ya'ni qurilish maqsadlari uchun yaroqli bo'lmagan (uzun va kalta);

b) o'rmon chiqindilari (gorbil, reyka va qirqindilar);

v) fanera va gugurt ishlab chiqarish chiqindilari (shpon-rvanina, somon braki va quti lomi);

g) qog'oz makulaturasi (kesim va yirtqilar).

Barcha yog'och tolali plitalarning taxminan 90 % yog'ochdan yasaladi.

Yog'ochning asosiy qismlari-sellyuloza va lignin, ularning elementar tarkibi (% da): sellyuloza – S 44,3; O 49,3; N 6,4; lignin – S 64,4; O 29,7; N 5,9.

Sellyuloza yarimsaharidlarga kiradi. Uning kimyoviy tarkibi taxminan (S6N10O5)x formula bilan ifodalanishi mumkin, bu erda x – kattaligi hali o'rnatilmagan polimerzatsiya koeffsienti. Lignin formulaga ega emas; u aniq kimyoviy birlikka ega emas, o'zida bir nechta moddalar birligini aks ettiradi. Kimyoviy u sellyuloza bilan bog'liq emas. Uni sellyulozadan ajratish mumkin, sellyuloza tuzilishi bunda buzilmaydi. Yog'och tarkibida sellyuloza va lignindan tashqari yana gemitsellyuloza ham bor. Yog'ochning barcha tarkibiy qismlari Yog'och tolali plitalarni ishlab chiqarish jarayonida qisman yoki butunlay tolaga aylanib, plitalarga aniq xususiyatlar beradi.

Lignin amorf va izotrop moddani o'zida aks ettiradi. Sellyuloza kristall tuzilishga ega; u mitsella deb nomlanuvchi kristallitlardan tashkil topgan bo'lib, ularning uzunligi 500- 700Å va qalinligi 50-60 Å mitsellalar fibrillarni hosil qiladi, ularni diametri 3000-5000 Å., bo'lgan tayoqchalarga ega. Mitsella va fibrillalardan turli shakldagi kletkalar tashkil topadi. Yog'ochdan yog'och tolali plitalar tayyorlash uchun ishlatishda tolasimon shaklli kletkalar katta ahamiyatga egadir.

Bargsimon jinsli yog'ochda bunday kletkalar librishakl tola deb nomlanadi. Ular uzun shaklga, ichki tor bo'shliqlarga, qalin devorlar va o'tkir uchlarga ega. Ignasimon jinsli yog'ochda cho'zinchoq kletkalar traxeid deyiladi. Ignasimon Yog'ochda traxeidlar hajm bo'yicha 90-95% ni, bargsimon yog'ochda esa libriforma tolalari tarkibi hajm bo'yicha 60-65% ni tashkil qiladi. Libriforma

tolalari traxeid tolalaridan qisqa va ingichkadir. Libriforma tolalari uzunligi 1 mm ega yaqin, diametri esa 20-30 mk; traxeidlar 3 dan 10 mm gacha uzunlikka va 30-70 mk diametrga ega. Yog'och tolali plitalar ishlab chiqarishda barcha tarqalgan yog'och-daraxt turlari; sosna, el, pixta, qayin, olxa, osina, terak va boshqalar ishlatilishi mumkin.

Yog'och tolali plitalar texnologiyasi. Yog'och tolali plitalar ishlab chiqarish jarayonini ikki qismga bo‘lish mumkin: yog'ochni ketma-ket tolali massaga maydalash va bu massadan plitalar olish.

Tolali massani olish va undan plitalarni qoliplash barcha tur plitalar uchun umumiy ishlab chiqarish oqimi bo‘yicha amalga oshadi. Qoliplangan plitalarni keyingi qayta ishlovchi ikki texnologik liniyalar bo‘yicha amalga oshiriladi:

izolyasiya plitalari quritiladi va mexanik ishlanadi, ayrim hollarda esa harorat chidamliligini oshirish uchun yong‘inga qarshi tarkiblar bilan qoplanadi;

qattiq plitalar issiq presslarda issiq bilan qayta ishlovdan o‘tkaziladi va suvga chidamli, haroratga chidamli emallar bilan ham qoplanishi mumkin.

Tovush yutish uchun mo‘ljallangan plitalarni alohida presslarda perforatsiyalanadi.

Mexanik xususiyatlar. Yog'och qirindili plitalar bir xil hajmiy og‘irlik qiymatida Yog'och tolali plitalarga qaraganda, siqish, bukish va cho‘zishda Yuqoriroq chidamlilik chegarasi ko‘rsatkichlariga ega. Masalan, hajmiy og‘irligi 500 dan 700 kg/m3 bo‘lgan yog'och qirindili plitalarni bukishdagi mustahkamlik ko‘pincha 180 kg/sm2 ga etadi va xuddi shunday hajmiy og‘irlikka ega yog'och tolali plitalarning mustahkamligidan taxminan to‘rt baravar ko‘pdir. Plitalar mustahkamligini texnologik jarayonlar parametrlarini, asosan ularni issiq presslash va yuzasini qayta ishlash rejimini o‘zgartirib, boshqarish mumkin. Masaslan, plitalarni qalinligi 0,6 mm li shpon bilan qoplab, bukishda mustahkamlik chegarasini oshirish mumkin.

Bukishdagi yog'och qirindili plitalar mustahkamligi qirindi turi, plitalar hajmiy og‘irligi, ularni qoplash usuliga bog‘liq va keng chegarada - 50 dan 150 kg/sm2 gacha bo‘ladi. Mustahkamlikka yana plitalar tayyorlash uchun ishlatilgan sintetik smolalar sifati ham ta'sir ko‘rsatadi.

Plitalar mustahkamligi namlikda keskin pasayadi, qurigandan so‘ng esa boshlang‘ich holi tiklanmaydi. Shuning uchun, plitalarning suvga chidamliligini oshirish uchun, qirindilar uchun gidrofobizatorlarni ishlatish va plitalarni qurilish konstruksiyalarida namlanishdan saqlash zarur.

Plitalar qo‘l asbobi va ishlovga yengil beriladi. Ularni arralash, teshish, frezerovkalash mumkin. Ularga mix qoqish mumkin va ular vintlarni yaxshi ushlaydi.

Ko‘p bo‘shliqli plitalarning issiqlik o‘tkazuvchanligi, butun plitalarga ko‘ra, hajm og‘irligi kam bo‘lsa ham, havo bo‘shliqlar mavjudligi sababli ko‘proqdir.Shunga ko‘ra, hajmiy og‘irligi 200 va 400 kg/m3 bo‘lgan ko‘p bo‘shliqli plitalar issiqlik o‘tkazuvchanlik koeffitsienti mos ravishda 0,12 va 0,14 kkal/m soat grad ga teng. Plitalarning akustik sifatlari faqatgina plitatalar xususiyatiga bog‘liq bo‘lmay, balki ma'lum ma'noda ularni konstruksiyalarda qo‘llashga bog‘liq.

Masalan, qalinligi 15 mm, hajmiy og‘irligi 600 kg/m3 bo‘lgan, hamda devordan 20 mm masofada o‘rnatilgan plita 0,4-0,7 tovush yutish koeffitsientiga ega.

Foydalanilgan adabiyotlar ro‘yxati:

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DEVORBOP QURILISH MATERIALLARNING TURLARI, ULARGA BO'LGAN TALABLAR

Annotatsiya: *Ushbu maqolada O'zbekistonda devorbop qurilish materiallarning turlari, ularga bo'lgan talablar va binolarida qo`llanilishi ko`rib chiqilgan.*

Kalit so'zlari: *sopol buyumlar, sopol toshlar, ichi g'ovakli g'isht, yengil g'isht.*

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TYPES OF WALL BUILDING MATERIALS AND REQUIREMENTS FOR THEM

Annotation: *This article examines the types of wall-building materials in Uzbekistan, their requirements, and their use in buildings.*

Key words: *ceramic products, ceramic stones, porous bricks, lightweight bricks.*

Devorbop buyumlar bir necha turga bo'linadi:

Devorbop sopol buyumlar-odliy copol g'isht, sopol toshlar, ichi g'ovakli g'isht, yengil g'isht, pardozbop g'isht, devorbop g'ishtli panellar.

Bular eng ko'p tarqalgan va eng kup ishlatiladigan buyumlar bulib xosh ashyo bazasi yetarli, ishlab chikarsh texnologiyasi yaxshi yulga kuyilgan. Bunday buyumlarni shlab chikaradigan korxonalar Respublikaning hamma shahar va tumanlarida qurilmoqda, ularga bo'lgan talab oshib bormoqda.

Devorbop silikat buyumlar-silikat g'isht, silikat beton buyumlar. Bylapdan yelgil silikat betonlar (gaz beton, kupil beton) asosida olinadigan buyumlar ishlab chikarish kuprok axamiyatga ega. Bunday buyumlar ishlab chikarishda samaradorligini oshirish imkoniyatini beradi.

Anorganik xom ashyo asosila olinaligan boshka devorbop buyumlar- bular tabiiy tosh materiallar asosida olinadigan gipsbeton buyumlar, asbestosement devorbop panellar, bu guruxga kiradigal buyumlar respublikada ko'p ishlab chikarilmayli, sababi xom ashyo bazasi yetarli emas, respublika sharoitida mos kelmaydi, zilzilabardoshlik talablariga tuliq javob bermaydi.

Organik xom ashyo asosida olinadigan devorbop materiallar- arbolit, fibrolit va x.k.

O’rta osiyo respublikalarining iklim sharoiti bu yerda yashaydigan xalklarning urf-odati, kup bolalik oilalar kupligi, bu joylarning zilzilaga nisbatan aktivligi (seysmik rayon) va bir kator boshka sabablarga kura xozirgi paytda respublikada devorbop sopol material va buyumlar ishlab chikarish kengaymokda. Bu bilan birga oddiy g’ishtning kamchiliklari xisobga olinib yengil, ichi bush gisht va toshlar, yirik ulchamli devorbop G’ISHT panellar ishlab chikarishga asosiy e’tibor berilmoqda.

Asosiy qurilish materiallari quyidagilarga bo'linadi:

Binolarning turli elementlarini (pollar, pollar, devorlar, tomlar) qurishda ishlatiladigan tabiiy narsalar yog'och (yog'och), beton, tsementdir.

Sun'iy-izolyatsiya, namlik izolatsiyasi va boshqalarni yaratish jarayonida ishlatiladigan maxsus mo'ljallangan materiallar.

Shuningdek, qurilish materiallarining tosh, o'rmon, bog'lovchi va metall turlari mavjud.

Devorbop qurilish materiallarining turlari:

1. Devorbop sopol buyumlar-oddiy sopol gisht, sopol toshlar, govakli gisht, yengil gisht, pardozbop g’isht, devorbop gishtli panellar.

Bular eng ko’p tarkalgan va eng ko’p ishlatiladigan buyumlar bo’lib, xom ashyo bazasi yetarli, ishlab chikarish texnologiyasi yaxshi yo’lga qo’yilgan. Bunday buyularni ishlab chiqaradigan korxonalar Respublikaning hamma shaxar va tumanlarida qurilmaqda, ularga bo’lgan talablar oshib bormoqda.

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Devorbop qurilish materiallarining xususiyatlari

Ular bino qanday sharoitda ishlatilishiga qarab tanlanadi. Hammasi bo'lib to'rtta asosiy xususiyatlar guruhi mavjud:

Jismoniy: zichlik, g'ovaklilik, issiqlik o'tkazuvchanligi, namlik.

Mexanik: mexanik stress, egiluvchanlik, qattiqlik uchun kuch chegaralari.

Texnologik: issiqlikka chidamlilik, ish qobiliyati, quritish tezligi.

Qurilish materiallari maqsadga muvofiq qanday tasniflanadi

Qurilish materiallarini maqsadga muvofiq tasniflash 8 guruhni nazarda tutadi:

•bog'lovchilar: sement, ohak, gips;

•devorlarni qurish uchun materiallar-tabiiy tosh, gips yoki beton bloklar, temir-beton panellar, har xil turdagi g'ishtlar;

•tugatish uchun materiallar: keramika, gips, tsement, polimer yoki tabiiy (tabiiy tosh);

•ovoz va issiqlik izolatsiyasi uchun qurilish materiallari - polimerlar, silikatlar, mineral tolalar, gips tolasi yoki shisha asosida;

•tom yopish va gidroizolyatsiya qoplamalari: shifer va plitkalar, polimer asosidagi qoplamalar, bitum, asbest tsement aralashmasi;

•muhrlash uchun formulalar va mahsulotlar - qistirmalar yoki mastikalar;

•sun'iy va tabiiy kelib chiqadigan beton agregatlar-shag'al yoki gözenekli jinslar;

•sanitariya-texnik ishlarni bajarish uchun quvurlar, sanitariya - tesisat aksessuarlari, buyumlar-temir-beton, asbest-tsement, polimerlar, shisha, metall, chinni va keramikadan tayyorlangan.

Qurilish materiallarining tasnifidan foydalanib, siz ushbu aniq sharoitlarda maqbul bo'lgan variantni topishingiz yoki ularning bir-birini almashtirishini aniqlashingiz mumkin..

Foydalanilgan adabiyotlar ro‘yxati:

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POLIMER PARDOZLASH MATERIALLARI TO'G'RISIDA UMUMIY TUSHUNCHALAR

Annotatsiya: *Ushbu maqolada polimer pardozlash materiallari to'g'risida umumiy tushunchalar ko`rib chiqilgan va tahlil qilingan.*
Kalit so'zlari: *polimer pardozlash materiallari, sopol toshlar, ichi g'ovakli g'isht, yengil g'isht.*

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GENERAL CONCEPTS ABOUT POLYMER FINISHING MATERIALS

Annotation: *This article reviews and analyzes general concepts about polymer finishing materials..*
Key words: *polymer finishing materials, ceramic stones, porous bricks, lightweight bricks.*

Polimer moddalar deb, tarkibida asosan yuqori molekulali organik moddalar bo‘lgan materiallarga aytiladi.

Ishlov berish vaqtida istalgan shakl berish mumkinligi va yuk olingandan keyin ham shu shalkda qolishligi hossasi borligi uchun ularni plastmassa ham deyiladi.

Qurilishda ishlatiladigan plastmassalar murakkab kompozitsion material bo‘lib, odatda tarkibida polimer bog‘lovchi material, mayda-tuyilgan to‘ldirgich, stabilizator, plastifiqator, qotiruvchi va boshqalar bo‘ladi.

Mayda-tuyilgan to‘ldirgich polimer sarfini kamaytirib, plastmassa narxini arzonlashtiradi va quyidagi texnik xossalarni yaxshilaydi: mustahkamlik, qattiqlik, kirishish, vaqti o‘tishi bilan torayishi.

Maxsus qo‘shimchalar qo‘shib-plastifiqatorlar-plastmassaga ishlov berish yaxshilanadi, mo‘rtligi kamaytiriladi, deformatsiya yaxshilanadi.

Stabilizator qo‘shimchalar-plastmassani ishlatish davomida o‘z xossalarni saqlab qolishga yordam beradi.

qotiruvchilar-polimer qotishini tezlashtirib, 3 o‘lchamli struktura hosil qiladi.

Pigment qo‘shib har xil rangdagi polimer materiallar olish mumkin.

Yonishga qarshiligini oshirish uchun antipirenlar qo‘shiladi. Zichligi kichik bo‘lishiga qaramay mustahkamligi yuqori bo‘lganligi uchun plastmassalardan effektiv konstruksiya va buyumlar olish mumkin. Plastmassalar issiqlikni va

elektrni yomon o‘tkazadigan material. Ko‘p plastmassalar kislotaga chidamli, ishqorga va boshqa reagentlarga ham chidamli. Ko‘p plastmassalar suv o‘tkazmaydi shuning uchun ulardan tombop, gidroizolyasion material va quvurlar olish mumkin. Tarkibida to‘ldirgich va pigment bo‘lmagan plastmassalar shaffof bo‘ladi.

Ishqalanishga mustahkamligi yuqori bo‘lganligi uchun ularni pol olishda ham ishlatiladi. Ularga ishlov berish oson, yelimlash, payvandlash mumkin.

Qurilish polimer materiallariga kelsak, ularning ish sharoitlari bilan bog'liqligini farqlash kerak:

- deformatsiya-kuchli (strukturaviy);
- issiqlikka (haroratga), tajovuzkor muhitga va maxsus talablarga qarshilik (masalan, shovqin, tebranish, zarba va hk.)

Polimerning nomi (polimer materiali)	Qo'llash sohasi
Gomopolimer strukturaviy-funksional materiallar	
Polietilen (pe) va kopolimerlar	Plitalar yoki rulonli gidroizolyatsiya materiallari; konteynerlar (vannalar, eritma uchun vannalar, kanistrlar); suv ta'minoti, kanalizatsiya, gaz quvurlari uchun quvurlar; armatura, ular uchun adapterlar; filmlar; issiq va kimyoviy agressiv muhitlar uchun quvurlar; boshqa qurilish materiallariga qoplamalar, bo'ronli drenajlar; pol uchun to'qilmagan tolali material, barcha turdagi binolar uchun KRUS issiq eritma yopishtiruvchi qismi sifatida
Polistirol (PS)	Kengaygan polistirol ishlab chiqarish uchun asos sifatida turar-joy va jamoat binolarining kommunal xonalari uchun qoplamali plitkalar, dekorativ plitalar
Polivinil butiral	Bo'yoq va laklar va yopishtiruvchi materiallar tarkibida; mustahkamlangan plastmassalar uchun bog'lovchilar; barcha turdagi binolar uchun Emulsion macun va E-VA-27A bo'yoq qismi sifatida.
Polimetil metakrilat (PMMA)	panellari, shu jumladan rangli, shaffof; bloklar; novdalar; quvurlar; profil va shaklli qismlar va panellar; engil gumbazlar; uy vannalari; yuvish havzalari; turli holatlar; yoritish; qoplamalar; modellar va shablonlar

Plastmassa ishlab chiqarish uchun 2-4 marta kam kapital mablag‘ sarflanadi. Har tonna plastmassa xalq xo‘jaligida 5,6 tonna po‘lat, 3,4 tonna rangli metall, 500 so‘mga yaqin kapital mablag‘ va ish-mehnat sarfi iqtisod qiladi.

Sintetik polimerlar.

Polimerlar deb molekulasi ko‘p marta qaytalanadigan yuqori molekulali birikmalarga aytiladi. (grekchadan poli-ko‘p, meros-qism).

Yuqori molekulali birikmalarga molekula vazni 5000 dan yuqorisiga aytiladi.

Kichik molekulali birikmalar molekula vazni 500 dan oshmaydi.

Molekula vazni 500 bilan 5000 orasida bo‘lsa oligomerlar deyiladi.

Polimerlarda molekulalar odatda chiziqli, tarqoq, to‘rsimon bog‘langan zanjirdan iborat.

Sintetik polimerlar 2 xil usulda olinadi:

-polimerizatsiya, polikondeksatsiya

Polimerizatsiya-kichik molekulali moddalar (monomerlarni) o‘zaro biriktirish jarayonidir, bunda ortiqcha modda ajralib chiqmaydi. Olingan polimerni massasi qo‘shilayotgan molekulalar massasiga teng bo‘ladi. Bu jarayonda 1 ta yoki bir necha monomer ishtirok etishi mumkin. Bir necha monomer bo‘lsa sopolimerizatsiya jarayoni, olingan mahsulot esa sopolimerlar deyiladi.

Jarayonga issiqlik, nur ta’sir etib initsiator-qo‘shimcha qo‘shib zanjir hosil qilinadi.

Polikondensatsiya-bu jarayon natijasida yuqori molekulali birikmalar (polikondensat) dan tashqari bir paytni o‘zida kichik molekulali birikmalar ham hosil bo‘ladi.

Bunda olingan mahsulot tarkibi qo‘shilayotgan mahsulotlar tarkibidan farq qiladi.

Polimerizatsiya usuli bilan olingan polimerlar:

Polietilen $[-SN_2-SN_2-]_n$, polipropilen

$[-SN_3SN-SN]_n$, polinzobutilen $[-SN_2S(SN_3)_2-]_n$

Polietilen molekulasi chiziqli bog‘langan bo‘lib, uni yuqori, o‘rta va past bosim bilan olinadi.

Polietilen organik eritmalarda kam eriydi, kislota, ishqorga, tuzlarga chidamli, suvga o‘ta chidamli mexanik mustahkamligi yuqori.

Polietilenni kamchiligi

-issiqqa chidamsiz (80^o C);

-yelimlash qiyin;

-kemiruvchilar oson kemiradi;

Polipropilen polietilenga o‘xshash bo‘lib, mexanik mustahkamligi va issiqqa chidamliligi yuqori.

Polietilen va polipropilendan, quvur, plyonka, list, penoplast, sanitar-texnik buyumlar, olinadi.

Polizobutilen-yumshoq elastik polimer. Polietilen va polipronilendan kimyoviy chidamligi va mustahkamligi past, lekin elastik.

Undan qurulish buyumlarini gidroizolyasiya qilish, buyum choklarini zichlash, yYelim va mastika olishda ishlatiladi.

Polistirol-$[C_6H_5CH-CH_2-]_n$-stiroldan polimer bo‘lib etilbenzoldan olinadi. U o‘ta shaffof, 90% nurni o‘tkazadi.

Kamchiligi-juda mo‘rt, organik eritmalarga chidamsiz. Undan penoplast, bezak plitalar olinadi.

Foydalanilgan adabiyotlar ro‘yxati:

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DEVORBOP QURILISH MATERIALLARINING O'RNI, ISHLAB CHIQARISHDA TEXNOLOGIK JARAYONLARI VA XOM ASHYO BAZASI

Annotatsiya: *Ushbu maqolada devorbop qurilish materiallarining o'rni, ishlab chiqarishda texnologik jarayonlari va xom ashyo bazasi va binolarida qo`llanilishi ko`rib chiqilgan.*

Kalit so'zlari: *sopol buyumlar, sopol toshlar, ichi g'ovakli g'isht, yengil g'isht.*

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THE PLACE OF WALL BUILDING MATERIALS, TECHNOLOGICAL PROCESSES IN PRODUCTION AND RAW MATERIAL BASE

Annotation: *This article examines the types of wall-building materials in Uzbekistan, their requirements, and their use in buildings.*

Key words: *ceramic products, ceramic stones, porous bricks, lightweight bricks.*

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2. Devorbop silikat buyular-silikat g’isht, silikat beton buyumlar. Bulardan yengil silikat betonlar (gazbeton, kupik beton) asosida olinadigan buyumlar ishlab chiqarishda ko’prok axamiyatga ega. Bunday buyumlar ishlab chikarish samaradorligini oshirish imkoniyatini beradi.

3. Anorganik xom ashyo asosida olnnadigan boshka devorbop buyumar - bular tabiiy tosh materiallar asosida olinadigan beton buyumlar asbestosement devorbop panellar, Bu guruxga kiradigan buyumlar respublikada ko’p ishlab chikarilmaydi, sababi xom ashyo bazasi yetarli emas» respublika sharoitida mos kelmaydi zilzilabardoshlik talablariga tula javob bermaydi.

4. Organik xom ashyo asosida olinadigan devorbop materiallar – arbolit, fibrolit va x.k.

5. O’rta osiyo ressublikalarining iqlim sharoiti bu yerda yashaydigan xalklarning urf-odati ko’p bolalik oilalar ko’pligi» bu, joylarning zilzilaga nisbatan aktivligi (seysmik rayon) va bir kator boshka sabablarga ko’ra xozirgi paytda respublikada devorbop sopol material va buyumlar ishlab chiqarish kengaymokda. Shu bilan birga oddiy g’ishtning kamchiliklari xisobga olinib yengil, ichi bo’sh g’isht va toshlar, yirik o’lchamli devorbop g’isht panellar ishlab chikarishga asosiy e’tibor berilmokda.

Devorbop qurilish materiallarining xususiyatlari

Ular bino qanday sharoitda ishlatilishiga qarab tanlanadi. Hammasi bo'lib to'rtta asosiy xususiyatlar guruhi mavjud:

Jismoniy: zichlik, g'ovaklilik, issiqlik o'tkazuvchanligi, namlik.

Mexanik: mexanik stress, egiluvchanlik, qattiqlik uchun kuch chegaralari.

Texnologik: issiqlikka chidamlilik, ish qobiliyati, quritish tezligi.

Qurilish materiallari maqsadga muvofiq qanday tasniflanadi

Qurilish materiallarini maqsadga muvofiq tasniflash 8 guruhni nazarda tutadi:

- bog'lovchilar: sement, ohak, gips;
- devorlarni qurish uchun materiallar-tabiiy tosh, gips yoki beton bloklar, temir-beton panellar, har xil turdagi g'ishtlar;
- tugatish uchun materiallar: keramika, gips, tsement, polimer yoki tabiiy (tabiiy tosh);
- ovoz va issiqlik izolatsiyasi uchun qurilish materiallari - polimerlar, silikatlar, mineral tolalar, gips tolasi yoki shisha asosida;
- tom yopish va gidroizolyatsiya qoplamalari: shifer va plitkalar, polimer asosidagi qoplamalar, bitum, asbest tsement aralashmasi;
- muhrlash uchun formulalar va mahsulotlar - qistirmalar yoki mastikalar;
- sun'iy va tabiiy kelib chiqadigan beton agregatlar-shag'al yoki gözenekli jinslar;
- sanitariya-texnik ishlarni bajarish uchun quvurlar, sanitariya - tesisat aksessuarlari, buyumlar-temir-beton, asbest-tsement, polimerlar, shisha, metall, chinni va keramikadan tayyorlangan.

Qurilish materiallarining tasnifidan foydalanib, siz ushbu aniq sharoitlarda maqbul bo'lgan variantni topishingiz yoki ularning bir-birini almashtirishini aniqlashingiz mumkin..

Foydalanilgan adabiyotlar ro‘yxati:

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SOPOL MATERIALLARI UCHUN XOM-ASHYO, QO'SHIMCHALAR VA BUYUM TURLARI

Annotatsiya: *Ushbu maqolada hozirgi kun qurilishida sopol materiallar va buyumlardan devorlar qurish va bino tomlarini yopish, pol, devor va fasadlarni qoplash, o'choq va tutun quvurlarini terish, oqava va drenaj quvurlari qurish hamda boshqa maqsadlar uchun foydalanilishi va qo`llanilishi ko`rib chiqilgan.*

Kalit so'zlari: *sopol buyumlar, sopol toshlar, ichi g'ovakli g'isht, yengil g'isht.*

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RAW MATERIALS, ADDITIVES AND PRODUCT TYPES FOR CERAMIC MATERIALS

Annotation: *This article examines the use and application of ceramic materials and products in modern construction for building walls and covering roofs, covering floors, walls and facades, lining furnaces and smoke pipes, constructing sewage and drainage pipes, and for other purposes..*

Key words: *ceramic products, ceramic stones, porous bricks, lightweight bricks.*

Qurilishbop sopol buyumlar sopolakning tuzilishi, konstruktiv jihatdan tuzilishi, sirtining holati va hokazolar bo'yicha turlanadi.

Gil-tog' jinslarining maydalangan(dispersiyali) tarkibiy qismi bo'lib, suv bilan plastik qorishma hosil qilish, qurigandan keyin unga berilgan shaklni saqlab qolish va pishirilgandan keyin tosh qattiqligiga ega bo'lish xususiyatiga ega.

Gil tarkibida dala shpati (granit, sienit, gneys va xokazo) bo'lgan ba'zi magmatik va metamorfik tog' jinslarining mexanik yemirilishi va kimyoviy parchalanish mahsuloti hisoblanadi. Dala shpatining parchalanishi natijasida kaolinit minerali Al2O3-2SiO2-2H2O hosil bo'lgan. Lekin tog' jinslarining tarkibida dala shpatidan tashqari boshqa minerallar (kvars, slyuda va hokazo) ham bo'ladi, Shu sababli ular yemirilganda gil, kvars, slyuda va parchalanmagan boshqa mineralllarning zarrachalaridan iborat murakkab aralashma hosil bo'ladi.

Gil tarkibida dala shpati, ohaktoshlarning parchalanmagan donalari Shuningdek, temirli, organik va boshqa moddalar bo'lishi mumkin. Ohaktoshning gil tarkibidagi yirik donalari zarrali aralashmalar hisoblanadi, chunki pishirish

jarayonida ular ohakka aylanadi, so‘ngra ohak havoda so‘nadi va hajmi kengayib sopol buyumlarni yemiradi.

Gillarning sopol materiallar ishlab chiqarishda hisobga olinadigan eng muhim xossalari plastikligi, havoda va olovda kichrayishi, olovbardoshligi, gil sopolakning rangi va hokazolardir.

Plastiklik deb, gil qorishmasining tashqi kuchlar ta’siri ostida darzlar hosil qilmasdan kerakli shaklga kirishi va kuch olingandan keyin Shu shaklni saqlab qolishiga aytiladi. Gil tarkibida gil zarrachalarining miqdori ortgan sari uning plastikligi ortadi. Gil qancha plastik bo‘lsa, yaxshi shakllanadigan gil qorishmasini hosil qilish uchun shunchalik ko‘p suv talab qilinadiki, bu esa o‘z navbatida quritish va pishirish jarayonida buyumlarning ko‘p kirishishiga sabab bo‘ladi. Gillar yuqori plastik gil, o‘rtacha plastik gil va kam plastik gillarga bo‘linadi. yog‘li gillarning plastikligi yaxshi bo‘ladi, ular bog‘lanuvchan bo‘ladi va oson shakllanadi, lekin buyumlar qurish jarayonida hajmi kichrayadi va darzlar hosil bo‘ladi. Kam plastik gillarga shakl berish juda qiyin bo‘ladi. Shakllanadigan massaning plastikligini oshirish, g‘isht va boshqa materialllarning sifatini yaxshilash uchun sirtiga faol moddalar -sulfat-achitqi bragasi (SDB) va boshqalar qo‘llaniladi.

Sopol materiallarni ishlab chiqarish uchun yuqori plastik gillar ishlatilganda xom ashyo aralashmasiga yog‘sizlantiruvchi qo‘shimchalar yoki ma’lum miqdorda plastikligi kam gil qo‘shiladi.

Gil zarrachalarini ajratish uchun zarur bo‘lgan kuch uning bog‘lanuvchanligini ko‘rsatadi. Yuqori bog‘lanuvchanlikka tarkibida ko‘p miqdorda gilli fraksiyalar bor gillar ega bo‘ladi.

Gilning bog‘lanish xususiyati shu bilan ifodalanadiki, gil plastik bo‘lmagan materiallarning zarrachalarini bog‘lashi (qum, shamot va boshqalar) va quriganida yetarli darajada mustahkam xom ashyo hosil qilishi mumkin.

Gillarning havoda kichrayishi 1100S da quritish jarayonida endigina qoliplangan namunaning chiziqli o‘lchamlarida foiz hisobida ifodalanadi. Yuqori plastik gillarning havoda chiziqli kichrayishi 10 % dan ortiq, o‘rtacha plastiklikdagi gilniki 6-10 va oz plastik gilniki 6 % dan kam bo‘ladi.

Gillarning olovda kichrayishi deb, pishirish jarayonida quruq namunaning chiziqli o‘lchamlarining o‘zgarishiga aytiladi. Gillarning olovda kichrayishi turiga qarab odatda 1-4 % atrofida bo‘ladi.

Olovbardoshlik - gilning yuqori harorat ta’siriga shakli o‘zgarmay bardosh bera olish xossasidir. Olovbardoshligi bo‘yicha gillar uch guruhga bo‘linadi: Yumshash harorati 15800S dan yuqori olovbardosh gillar; yumshash harorati 1580°-1350°S bo‘lgan qiyin suyuqlanadigan gillar va yumshash harorati 13500S dan past oson suyuqlanadigan gillar.

Olovbardosh gillar gilli zarrachalardan iborat bo‘lib, ularning tarkibida ozgina miqdorda aralashmalar bo‘ladi va shu sababli yuqori plastiklikka ega. Bu gillar olovbardosh chinni va fayans buyumlarni tayyorlash uchun ishlatiladi. Qiyin suyuqlanadigan gillar pol plitkalari, oqava quvurlari va qurilishbop sopolakning boshqa turlarini ishlab chiqarishda qo‘llaniladi.

Gilli massalar yoki ularning aralashmasiga mineral qo‘shilmalar qo‘shib, qoliplash va kuydirish yo‘li bilan olinadigan materiallar va buyumlarga “sopol materiallar” deb ataladi.

Sopol buyumlarni (asosan turmushda ishlatiladigan idish-tovoqlar, vaza va shu kabilar) ishlab chiqarish miloddan bir necha ming yil avval, juda qadim zamonlarda paydo bo‘lgan. Ancha keyin cherepitsa, qoplama plitalar va g‘isht kabi sopol qurilish materiallarini tayyorlash boshlangan.

Hozirgi kun qurilishida sopol materiallar va buyumlardan devorlar qurish va bino tomlarini yopish, pol, devor va fasadlarni qoplash, o‘choq va tutun quvurlarini terish, oqova va drenaj quvurlarini qurish hamda boshqa maqsadlar uchun foydalaniladi. Sopol buyumlar yasaladigan material sopol ishlab chiqarish texnologiyasida “sopolak” deb ataladi.

Qurilishbop sopol buyumlar sopolakning tuzilishi, konstruktiv tavsiflari, sirtining holati va h. bo‘yicha turlanadi.

Konstruktiv tavsiflari va ishlatilishi bo‘yicha sopol materiallar va buyumlar quyidagi guruxlarga bo‘linadi: devorlar uchun (g‘isht, sopolak toshlar, g‘ishtdan qilingan bloklar va panellar); tomlar uchun (ichi kovak toshlar, sopol toshlardan yasalgan to‘sinlar, tom va qoplama panellari); binolar fasadini qoplash uchun (sopol g‘isht va toshlar, fasad plitkalari, gilam sifatidagi sopolak va boshqalar); binolar ichiga qoplash uchun (sirlangan plitkalar va fason detallar, pol uchun plitkalar); tom uchun mo‘ljallangan (shtamplangan pazli va tasmasimon gil cherepitsa, yassi va to‘lqinsimon tasma va boshqalar); oqova va drenaj quvurlari, santexnika buyumlari (chanoq, vanna, hojatxona tuvagi, yuvish idishchalari va boshqalar); kislotabardosh buyumlar (g‘isht, plitkalar, quvurlar); yo‘l materiallari (g‘isht va toshlar); issiqdan himoyalovchi materiallar (g‘ovakli ichi bo‘sh g‘ishtlar va toshlar, perlitli sopol va boshqalar); engil betonlar uchun to‘ldiruvchilar (keramzit, agloporit); olovbardosh buyumlar (g‘isht va shakldor buyumlar).

Sopolakning tuzilishiga ko‘ra sopol buyumlar g‘ovakli va zich xillarga bo‘linadi. G‘ovakli materiallardan yasalgan sopolak singanda xira ko‘rinadi, suvni oson shimib oladi, g‘ovakligi 5% dan ortiq. G‘ovakli sopol buyumlar jumlasiga g‘isht, ichi kovak toshlar, cherepitsa va boshqalar kiradi. Oq yoki bir tekis bo‘yalgan zich materiallar singanda yaltiroq chig‘anoqsimon ko‘rinadi, g‘ovakligi 5% dan oshmaydi, suyuqlik va gazlarni o‘tkazmaydi. Zich sopol buyumlar ichida pol plitkalari, kislotaga chidamli g‘isht va boshqalarni aytish mumkin.

Sopol buyumlar sirlangan va sirlanmagan bo‘lishi mumkin Sir (bo‘yoq) kuydirish yo‘li bilan puxtalab singdirilgan shishasimon qoplamdir. U buyumlarni tashqi ta’sirlarga chidamli, suv o‘tkazmaydigan va chiroyli manzarali qiladi.

Qo‘shilmalar. Plastik sergil xom ashyo sopol materiallar ishlab chiqarishda kam ishlatiladi, chunki quritish va pishirish jarayonida ular sezilarli hajmiy kichrayadi, buning natijasida yoriqlar hosil bo‘ladi. Hajmiy kichrayishni kamaytirish uchun xom ashyo aralashmasining tarkibiga gilni kamaytiruvchi materiallar (qum, shlak, qattiq yoqilg‘ining yonishidan hosil bo‘lgan kul, maydalangan sopol sinig‘i, shamot va boshqalar) kiritiladi.

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SOPOL MATERIAL VA BUYUMLAR ISHLAB CHIQARISH

Annotatsiya: *Ushbu maqolada xom ashyo massasini tayyorlash. Karerda qazib olingan va zavodga tashib keltirilgan gil tabiiy holatda, odatda, buyumlar qoliplash uchun yaroqsiz bo‘ladi va tabiiy tuzilishini buzish, undan zararli aralashmalarni chiqarib tashlash, yirik aralashmalarni maydalash, gilga qo‘shimchalar aralashtirish, shuningdek, qulay qoliplanadigan massa hosil qilish uchun uni namlash kerakligi va qo`llanilishi ko`rib chiqilgan.*

Kalit so’zlari: *sopol buyumlar, sopol toshlar, ichi g’ovakli g’isht, yengil g’isht.*

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PRODUCTION OF CERAMIC MATERIALS AND ITEMS

Annotation: *This article discusses the preparation of raw material mass. Clay mined in a quarry and transported to the factory in its natural state is usually unsuitable for molding objects, and the need and use of breaking its natural structure, removing harmful impurities from it, crushing large impurities, mixing additives into the clay, as well as moistening it to form a convenient molding mass are considered.*

Key words: *ceramic products, ceramic stones, porous bricks, lightweight bricks.*

Xom ashyo aralashmasi yarim quruq, plastik yoki xo‘l (shliker)usullarda tayyorlanadi. Bu usullardan qaysi birini tanlash xom ashyo materiallarining xossalariga, sopol massaning tarkibiga va buyumlarni qoliplash usuliga, shuningdek, ularning o‘lchamlari va vazifasiga bog‘liq.

Yarim quruq usulda xom ashyo materiallari quritiladi, bo‘laklanadi, maydalanadi va sinchiklab aralashtiriladi. Gil odatda, quritish barabanlarida quritiladi, quruqlayin tuyish mashinasida, dezintegratorlar yoki sharli tegirmonlarda parchalanadi va maydalanadi, kurakli aralashtirgichlarda aralashtiriladi. Press - kukunning namligi 9-11% ga teng bo‘lib, u to kerakli namlikka ega bo‘lmaguncha suv yoki bug‘ bilan namlanadi.

Yarim quruq presslab tayyorlangan qurilish g‘ishti, pol plitkalari, qoplama plitka va boshqalar tayyorlashda xom ashyo aralashma tayyorlashning yarim quruq usulidan foydalaniladi.

Plastik usulda xom ashyo materialari tabiiy namlikda aralashtiriladi yoki namligi 18-23 % bo‘lgan gil qorishmasi hosil bo‘lgunga qadar suv qo‘shiladi. Xom ashyo materiallarini maydalash va qayta ishlash uchun turli turdagi jo‘valar va tegirmon toshidan, aralashtirish uchun esa gil- qorgichlardan foydalaniladi.

Shliker usulda xom ashyo materiallar oldindan maydalab kukun qilinadi, so‘ngra esa ko‘p miqdorda suv quyib yaxshilab aralashtiriladi,bunda bir jinsli suspenziya(shliker) hosil bo‘lishi kerak. Bu usul chinni buyumlar, qoplama plitka va boshqalarni ishlab chiqarishda qo‘llaniladi.

Buyumlarni qoliplash. Sopol buyumlar har xil usullarda: plastik, yarim quruq va quyib qoliplanadi. qoplash usulini tanlash buyumlar turiga, shuningdek, xom ashyoning tarkibi va fizik-mexanik xossalariga bog‘liq.

Plastik usulda qoliplash-buyumlarni plastik gil massalardan presslarda tayyorlash-qurilishbop sopol buyumlar ishlab chiqarishda eng ko‘p tarqalgan usuldir.

Namligi 18-23% qilib tayyorlangan gil massasi lentali pressning qabul qilish bunkeriga yo‘naltiriladi. Massa shnek yordamida qo‘shimcha aralashtariladi, zichlanadi va almashinuvchi mushtuk bilan jixozlangan pressning chiqish teshigi orqali bruss ko‘rinishida siqib chiqariladi. Mushtukni almashtirib, shakli va o‘lchamlari turlicha bo‘lgan bruss olish mumkin. Pressdan to‘xtovsiz chiqayotgan brussni tayyorlanayotgan buyumlarning o‘lchamlariga muvofiq avtomatik kesish qurilmasi uni alohida qismlarga qirqib ajratadi.

Zamonaviy lentali presslar vakuum kamera bilan jixozlangan bo‘lib, ularda gil massasidan qisman havo chiqarib yuboriladi. Massa vakuumlanganda uning plastikligi ortadi va qoliplanish namligi kamayadi, xom ashyoni quritish vaqti qisqaradi va bir yo‘la mustahkam bo‘ladi.

Buyumlarni quritish. qoliplangan buyumlarning namligini kamaytirish uchun ularni quritish zarur, masalan xom g‘isht 8-10% namlikkacha quritiladi. quritish hisobiga xom ashyoning mustahkamligi oshadi, pishirish jarayonida darzlar ketishi va shakli o‘zgarishining oldi olinadi. Buyumlarni tabiiy va sun’iy usulda quritish mumkin.

quritish bostirmalarida tabiiy usulda quritish yoqilg‘i sarflashni talab qilmaydi, lekin uzoq vaqt (10-15 kun) davom etadi va havoning harorati va namligiga bog‘liq bo‘ladi. Bundan tashqari, tabiiy usulda quritish uchun keng xonalar talab qilinadi.

Hozirgi vaqtda yirik zavodlarda, odatda, xom ashyo vaqti-vaqti bilan ishlaydigan kamerali quritgichlarda va uzluksiz ishlaydigan tunnelli quritgichlarda sun’iy usulda quritiladi.

quritish tartibi buyum turiga qarab tanlanadi. quritgichlarda pishirish o‘choqlarini tutun gazlari, shuningdek, maxsus o‘txonalarda hosil bo‘ladigan gazlardan foydalaniladi.

Xom ashyoni quritish muddati 1 kundan 3 kecha-kunduzgacha davom etadi, yupqa buyumlar esa bir necha soatda quritilishi mumkin.

Buyumlarni pishirish sopol buyumlar ishlab chiqarish texnologiyasi jarayonining xal qiluvchi bosqichidir. Pishirish jarayonini shartli ravishda uch

davrga bo‘lish mumkin: xom ashyoni qizdirish, pishirish va sovitish. Xom ashyoni qizdirishda harorat asta-sekin 100-1200S gacha ko‘tariladi, bunda undan erkin suv chiqarib yuboriladi. SHundan keyin harorat 7500S gacha ko‘tariladi, gilli mineraldagi va xom ashyo aralashmasining boshqa birikmalaridagi organik aralashmalar yonib bitadi va himiyaviy bog‘langan suv chiqib ketadi.

Sopol buyumlar halqasimon, tunnel, tirqishli, rolikli va boshqa o‘choqlarda pishiriladi.

Halqasimon o‘choq ellipsga o‘xshash tutash pishirish kanalidan iborat bo‘lib, shartli ravishda kameralarga bo‘lingan. Halqasimon o‘choq kameralarining miqdori uning unumdorligiga qarab 16 dan 36 gacha o‘zgarib turadi. SHartli kameralar guruxlarga quyidagi izchillikda joylashgan donalarga birlashtiriladi: yuklash, qizdirish, pishirish, sovitish va o‘choqdan chiqarib olish. Halqasimon o‘choqda yonish o‘chog‘i boshqa bo‘limlar kabi pishirish kanali bo‘ylab to‘xtamasdan siljiydi, pishirilayotgan mahsulot esa o‘z joyida bo‘ladi.

Halqasimon o‘choqlarda asosan g‘isht va cherepitsa pishiriladi. Pishirish harorati 900-11000S ga teng. Halqasimon o‘choqda butun pishirish jarayoni 3-4 kecha kunduz davom etadi.

Tunnel o‘choq - uzunligi 100 m gacha bo‘lgan, boshi va oxiri ochiq kanaldan iborat bo‘lib, unda pishiriladigan buyumlar joylangan vagonchaalar temir izlarda harakatlanadi. Tunnel o‘choqda halqasimon o‘choqdagi kabi alohida bo‘limlar bo‘lib, ularda yuklash, qizdirish, pishirish, sovitish va o‘choqdan chiqarib olish bosqichlari bajariladi. Lekin tunnel o‘choqda bo‘limlar bo‘ylab buyumlar siljiydi, bo‘limlar esa o‘z joyida qoladi.

Tunnel o‘choqlar gazda yoki mayda ko‘mirda qizdiriladi. Bu o‘choqlarda maxsulotni yuklash va tushirish jarayonlarini mexanizatsiyalashtirish, shuningdek,pishirish jarayoni va uni rostlashni avtomatlashtirish oson bo‘ladi. Pishirish jarayoni 18-38 soat davom etadi. Tunnel o‘choqlar halqasimon o‘choqlarga nisbatan ancha unumdor va tejamli hisoblanadi.

Devorbop sopol materiallar va buyumlar

Devorbop sopol materiallar va buyumlar ichida hozirgi vaqtda eng ko‘p tarqalgani sopol g‘isht, har xil samarali sopol materiallar, shuningdek devorbop g‘isht panellaridir.

To‘liq sopol g‘isht 250x120x65 mm (25-rasm) yoki 250x120x88 mm o‘lchamli, to‘g‘ri to‘rtburchakli paralleliped shaklida bo‘ladi. qalinligi 88 mm modulli g‘ishtlarda texnologik bo‘shliqlar bo‘lishi shart.

O‘lchamlardan chetga chiqish uzunligi bo‘yicha ±5, eni bo‘yicha ±4, qalinligi bo‘yicha ± 3 mm dan ortiq bo‘lmasligi kerak.

- g‘isht etarli pishgan bo‘lishi kerak. Alvon rangli, chala pishgan g‘isht zichligi va sovuqqa chidamliligi, o‘ta pishgan g‘isht juda zich, mustahkam va issiqlik o‘tkazuvchanligi yuqori bo‘lishi bilan farqlanadi.

- g‘ishtning quruq holatdagi zichligi 1600-1900 kg/m3, issiqlik o‘tkazuvchanligi esa 0,71 – 0,82 Vt/(m·0S) atrofida o‘zgaradi. g‘ishtni bu xossalari uni tayyorlash usullariga bog‘liq. YArim quruq zichlangan g‘isht g‘oyat zich, binobarin, ko‘p issiqlik o‘tkazuvchan bo‘ladi.

Siqilishga va egilishga mustahkamligi bo‘yicha g‘isht qo‘yidagi markalarga bo‘linadi: 75,100,125,150,175,200 va 300.

Foydalanilgan adabiyotlar ro‘yxati:

1. KMK 2.08.01 - 05. «Turar joy binolari» Toshkent, 2005 y.
2. SHNK 2.07.01 - 94 «SHaxarsozlik, shaxa rva qishloq axolii punktlarini rejalashtirish va ko‘rish» Toshkent, 1994 y.
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G‘ISHTLI PANELLAR ISHLAB CHIQARISH TEXNOLOGIYASI

Annotatsiya: *Ushbu maqolada G‘ishtli panellar ishlab chiqarish texnologiyasi va qo`llanilishi ko`rib chiqilgan.*
Kalit so’zlari: *G‘ishtli panellar, sopol buyumlar, sopol toshlar, ichi g’ovakli g’isht, yengil g’isht.*

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TECHNOLOGY FOR MANUFACTURING WOODEN PANELS

Annotation: *This article discusses the production technology and application of brick panels..*
Key words: *Brick panels, ceramic products, ceramic stones, porous bricks, lightweight bricks.*

Ishlab chiqarish texnologiyasi quyidagi bosqichlardan iborat: I-karyer ishlari (qazib olish tashish) 2. press poroshok tayyorlash 3. presslash 4. quritish 5.pishirish.

Xom ashyoni qazib olish, tashish odatdagiday olib boriladi. Press poroshok tayyorlash –bular sochiluvchan dipers massalar bo’lib o’zaro yopishmaydi.

Sopol buyumlar uchun press-poroshok 2 xil usul bilan tayyorlanadi: quritish-maydalash va shliker usuli. Quritish- maydalash usulida giltuproq avval yirik maydalagichda maydalanadi, quritiladi so’ngra mayin maydalanadi, elakdan o’tkaziladi va namlanadi. Maydalash valikli maydalagichda olib boriladi, quritish barabanli quritgichlarda olib boriladi (to’g’ri oqimda). Quritgichdan chiqqan giltuproqning namligi 9 11%

Mayin maydalash (tuyish) uchun dezintigratorlar ishlatiladi. Dezintigratordan chiqqan tuproq elaklanadi, yirik zarralari ajratiladi.

Shliker usuli bilan press poroshok olishda giltuproq gilqorigichlarda issiq suv yordamida (40-450-)aralashtirilib, shliker xosil qilinadi. Keyin bosim ostida(0,25 MPa) elakdan o’tkazilib toshlar ajratiladi va shlambasseynlarga quyiladi.

Shlambasseyndan suyuq massa nasos yordamida sochiluvchan quritgichlarda beriladi va ulardan 10% namlikdagi poroshok xolida chiqib xom ashyo bunkerlariga tushadi.

Shliker usuli quritish-maydalash usulidan yaxshiroq. Bunda bitta apparatda giltuproqni ham quritish ham donalarga ajratish jarayoni bo’ladi, ishlab chiqarish sharoiti yaxshi, press poroshokni namligi xamma joyda bir xil tarqaladi.

Sopol poroshoklardan buyumlarni presslash-sopol poroshok uch fazali sistema bo'lib, qattiq modda zarralari, suyuq faza-suv va xavodan iborat.

Presslash boshida poroshok zichlashadi (zarrachalar bir-biriga yaqinlashadi. Bu zichlashtirishning birinchi bosqichi bo'lib, bir qism havo ajratiladi).

Ikkinchi bosqichda plastik deformasiya bo'ladi, uchinchi bosqichda elastik deformasiya bo'ladi. Yarim quruq presslash yo'li bilan g'isht olishda SM-301 press ishlatiladi.

Presslangan buyumlarni quritish 1950-55 yillargacha zavodlarda presslashdan keyin g'isht xumdonlarga pishirishning boshida quritilar edi, bunda brak maxsulot kup xosil bo'ladi. Keyingi yillarda qurilgan zavodlarda pressdan keyin buyumlar tunnelli sushilkalarda quritiladi.

Quritish muddati 16-24 s, chiqishdagi namligi 4-6% . Qizdirish uchun pechlardan chiqadigan issiq havo va gazlar ishlatiladi, ularning boshlang'ich temperaturasi 120-1500S

Pishirish.Poroshok massadan presslash yo'li bilan tayyorlangan g'ishtni pishirishda uning o'ziga xos tuzilishini xisobga olish kerak. Presslash yo'li bilan olingan g'ishtlarning egilishdagi mustahkamligi kichik, suv va gaz o'tkazuvchanligi katta, pishirish temperaturasi yuqoriroq pishish intervali kattaroq. Buning sababi presslashda xosil bo'lgan buyum tuzilishining o'ziga xosligidir.

Oddiy sopol g'isht o'lchamlari.RST 530-95 250x120x65 mm, 250x120x88 mm, Ro=1600-1900 kg m3, Λ=0,7-0,82

Markalari: M 75, 100, 125, 250, 200, 250, 300, Suv shimuvchanligi 8 % kam bulmasligi kerak. Markasi m 150 dan yuqori g'ishtlar uchun 6 % dan kam bulmasligi kerak. Sovuqqa chidamliligi 15, 25, 35, 50. Xom ashyo-o'rtacha plastik, tez eriydigan gil tuproq.

Samarador sopol materiallari: Oddiy g'ishtdan tayyorlangan devorning qalinligi 2-2, 5 g'isht yani 52-64 sm bo'ladi, devorning massasi juda og'ir (800-1100 kg) buladi. Chunki g'isht mustaxkam bo'lsada issiq-sovuqni ko'p o'tkazadi. G'ishtning issiq o'tkazuvchanligini kamaytirish uchun uni ichi g'ovak, yoki yengil g'ovak qilib tayyorlanadi.

Bunday g'ishtlarni ishlatganda devorning qalinligini kamaytirish mumkin, devor uchun sarf bo'ladigan materialni 20-30 % arzonlashtirish yo'l xarajatlarini kamaytirish mumkin.

Ichi kovak g'isht. Tez eriydigan gil tuproq va qushimchalardan tayyorlanadi.

Ulchamlari 250x120x65 mm, 520x120x103 mm. Markalari 75-150, Ro=1000-1450 kg/m3, issiq utkazuvchanligi, Λ=0,5-0,6 vt/m grad. Sovuqqa chidamliligi, Mrz 15. suvshimuvchanligi 6 %

Yengil g'isht. Gil tuproqqa yonuvchan qo'shimchalar qo'shish yo'li bilan, xamda diatomit, trepel kabi tog' jinslaridan tayyorlanadi.

Zichligi (xajmiy massasi) ga ko'ra ular uch sinfga bo'linadi: A sinf Ro= 700-100 kg/m3, B sinf Ro= 1001-1300 kg/m3, V sinf Ro= 1300 kg/m3, Issiq o'tkazuvchanligi Λ=0,3-0,6 vt/ m °C

Markasi 35, 50, 75, 100. bunday g'ishtlarni nam joylarda ishlatish mumkin imas. G'ishtning o'lchamlari kichik bo'lgani uchun yirk sopol toshlar ishlab

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G'ishtli panellar ishlab chiqarish texnologiyasi. Sopol g'isht juda qadim zamonlardan (5000 yil oldin) beri ishlatilib keladigan va xozirgi paytda xam eng yaxshi devorbop material xisoblanadi. Buning bir qator sabablari bor: Giltuproq zapaslarining kupligi (xamda joyda tarqalganligi) xar xil yoqilg'i ishlatish mumkin, kichkina va katta korxonalar kurib g'isht chiqarish mumkin va x. k. Lekin g'ishtning asosiy kamchiligi uning og'irligi (urtacha zichligi katta) va o'lchamlarining kichikligi.

Bu kamchiliklarni bartaraf qilish uchun ichi kovakli effektiv buyumlar chiqariladi. Devorbop sopol toshlarning bo'shligi 55 % gacha bo'lib o'rtacha zichligi 1000-1050 kg/m3 ni tashkil qiladi.

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KERAMIK MATERIALLARINI ISHLAB CHIQARISH UCHUN XOM ASHYOLAR

Annotatsiya: *Ushbu maqolada keramik materiallarini ishlab chiqarish uchun xom ashyolar ko`rib chiqilgan va tahlil qilingan.*
Kalit so'zlari: *keramik materiallar, sopol buyumlar, sopol toshlar, ichi g'ovakli g'isht, yengil g'isht.*

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RAW MATERIALS FOR THE PRODUCTION OF CERAMIC MATERIALS

Annotation: *This article reviews and analyzes raw materials for the production of ceramic materials.*
Key words: *ceramic materials, ceramic products, ceramic stones, porous bricks, lightweight bricks.*

Qurilish keramika mahsulotlarini ishlab chiqarish uchun asosiy xom ashyo loy xom ashyosi bo'lib, u sof shaklda ishlatiladi va ko'pincha qo'shimchalar bilan aralashtiriladi - tozalash, tosh hosil qilish, suyuqlik, plastifikatorlar va boshqalar.

Loy xom-ashyosi Loy xomashyosi (loy va kaolinlar) - boshqa tog ' jinslarining aralashmalarini o'z ichiga olgan, otilgan dala shpat jinslarining nurash mahsuloti.

Diametri 0,005 mm va undan kam bo'lgan loy mineral zarralari suv bilan yopilganda plastik xamir hosil qilish qobiliyatini ta'minlaydi, quriganida berilgan shaklni saqlab qoladi va otishdan keyin toshning suvga chidamliligi va mustahkamligiga ega bo'ladi.

Loy zarralaridan tashqari, xom ashyo tarkibida don o'lchamlari 0,005-0,16 mm bo'lgan chang zarralari va don o'lchamlari 0,16-2 mm bo'lgan qum zarralari mavjud.

Loy zarralari plastinkaga o'xshash shaklga ega bo'lib, ular namlanganda yupqa suv qatlamlari hosil bo'lib, zarrachalarning shishishiga va ularning bir-biriga nisbatan sirpanish qobiliyatiga olib keladi. Shuning uchun suv bilan aralashtirilgan loy oson shakllanadigan plastik massani beradi.

Quritganda loy xamiri suvni yo'qotadi va hajmi kamayadi. Bu jarayon havo qisqarishi deb ataladi.

Yuqori plastik loylar tarkibida 80-90% gacha loy zarralari, plastika soni 25 dan ortiq, suvga bo'lgan ehtiyoj 28% dan ortiq va havo qisqarishi 10-15% ni tashkil qiladi. O'rtacha va o'rtacha plastik gillarning tarkibida 30-60% loy zarralari, plastika soni 15-25, suvga bo'lgan ehtiyoj 20-28% va havo qisqarishi 7-10% ni tashkil qiladi.

Kam plastik loylar tarkibida 5% dan 30% gacha loy zarralari, suvga bo'lgan ehtiyoj 20% dan kam, plastika soni 7-15 va havo qisqarishi 5-7% ni tashkil qiladi.

Plastik bo'lmagan loylar plastik, oson shakllanadigan xamirni hosil qilmaydi.

60% dan ortiq loy zarralari bo'lgan loylar "yog'li" deb nomlanadi, ular yuqori qisqarish bilan ajralib turadi, buning uchun loylarga "tozalovchi" qo'shimchalar qo'shiladi.

Loy zarralari miqdori 10-15% dan kam bo'lgan loylar*- "oriq" loylar, ularga mahsulot ishlab chiqarishda nozik dispersli qo'shimchalar, masalan, bentonit gil kiritiladi.

Komponentlarning kimyoviy, mineralogik va granulometrik tarkibining turli xil kombinatsiyasi loy xom ashyosining turli xil xususiyatlarini va uning ma'lum xususiyatlar va maqsadlar uchun keramika mahsulotlarini olish uchun yaroqliligini aniqlaydi.

Loylarning granulometrik tarkibi mineralogik tarkib bilan chambarchas bog'liq.

Qumli va changli fraksiyalar asosan birlamchi minerallarning qoldiqlari (kvarts, dala shpati, slyuda va boshqalar) shaklida taqdim etiladi.

Loy zarralari asosan ikkilamchi minerallardan iborat: kaolinit, montmorillonit, gidroslyud va ularning aralashmalari turli xil kombinatsiyalarda.

Kaolinitning asosiy tarkibiga ega bo'lgan loylar engil rangga ega, suv bilan o'zaro ta'sirlashganda zaif shishadi, refrakterlik bilan ajralib turadi, past plastik va quritishga sezgir emas.

Montmorillonitni o'z ichiga olgan loylar juda plastik, juda shishadi, qoliplash paytida ular qoziq hosil bo'lishiga moyil, mahsulotlarning egriligi va yorilishi namoyon bo'lishi bilan quritish va yoqishga sezgir.

Montmorillonitning asosiy tarkibiga ega bo'lgan yuqori tarqalgan loy jinslariga bentonitlar deyiladi.

0,001 mm dan kichik zarrachalarning tarkibi 85-90% ga etadi.

Gil qismida gidroslyud minerallarining ustunligi bo'lgan namunalar plastiklik, qisqarish va quritishga sezgirlikning oraliq ko'rsatkichlari bilan tavsiflanadi.

Ishqoriy metall oksidlari kuchli suyuqliklardir, ular qisqarishni, parchaning siqilishini va uning mustahkamligini oshirishga yordam beradi. Loy xom ashyosida natriy sulfatlar va natriy, kaltsiy, magniy va temir xloridlarning eruvchan tuzlari mavjudligi mahsulotlar yuzasida oq ranglarning paydo bo'lishiga olib keladi.

Olovga chidamli issiqlik izolyatsiyasi mahsulotlarining ayrim turlarini ishlab chiqarish uchun asosan amorf kremniydan tashkil topgan trepel va diatomitlardan loy xom ashyosi ishlatiladi va engil agregatlarni ishlab chiqarish uchun perlit, pomza, vermikulit ishlatiladi.

Hozirgi vaqtda tabiiy loylar kamdan-kam hollarda keramika mahsulotlarini ishlab chiqarish uchun konditsioner xom ashyo hisoblanadi. Shu munosabat bilan ular turli maqsadlar uchun qo'shimchalar kiritish bilan qo'llaniladi.

Tozalash qo'shimchalari. Ular plastik loylarga kiritiladi quritish va yoqish paytida qisqarishni kamaytirish va mahsulotdagi deformatsiyalar va yoriqlarning oldini olish kunlari. Bularga quyidagilar kiradi: suvsizlangan loy, shamot, shlaklar, kul, kvarts qumi.

Teshik hosil qiluvchi qo'shimchalar. Ular parchaning g'ovakliligini oshirish va keramika mahsulotlarining issiqlik izolyatsiyasi xususiyatlarini yaxshilash uchun kiritiladi. Bularga quyidagilar kiradi: talaş, ko'mir kukuni, torf changi. Ushbu qo'shimchalar bir vaqtning o'zida tozalanadi.

Yumshoq. Ular keramika mahsulotlarini otish haroratini pasaytirish uchun kiritiladi. Bularga quyidagilar kiradi: dala tariqlari, temir rudasi, dolomit, magnezit, talk, qumtosh, pegmatit, shisha, perlit.

Plastiklashtiruvchi qo'shimchalar. Ular kamroq suv sarfi bilan xom ashyo aralashmalarining plastisiyasini oshirish uchun kiritiladi. Bularga yuqori plastik loylar, bentonitlar, sirt faol moddalar kiradi.

Maxsus qo'shimchalar. Keramika mahsulotlarining kislota qarshiligini oshirish uchun xom ashyo aralashmalariga suyuq shisha bilan yopilgan qum aralashmalari qo'shiladi. Rangli keramikaning ayrim turlarini olish uchun xom ashyo aralashmasiga metall oksidlari (temir, kobalt, xrom, titan va boshqalar) qo'shiladi.

Sanitariya-gigiyena xususiyatlarini, suvga chidamliligini oshirish, tashqi ko'rinishini yaxshilash uchun keramika mahsulotlarining ayrim turlari dekorativ qatlam bilan qoplangan - sir yoki angob.

Sir-qalinligi 0,1-0,2 mm bo'lgan shishasimon qoplama, mahsulotga qo'llaniladi va otish bilan o'rnatiladi. Sirlar har xil rangdagi shaffof va zerikarli (shaffof emas) bo'lishi mumkin.

Sirlarni tayyorlash uchun quyidagilar qo'llaniladi: kvarts qumi, kaolin, dala shpati, gidroksidi va gidroksidi tuproq metallarining tuzlari. Xom aralashmalar kukunga maydalanadi va kuyishdan oldin mahsulot yuzasiga kukun yoki suspenziya shaklida qo'llaniladi.

Angob-bu mahsulotga qo'llaniladigan oq yoki rangli loyning yupqa qatlami bo'lib, u mat yuzasi bilan rangli qoplamani hosil qiladi. Xususiyatlari jihatidan angob asosiy parchaga yaqin bo'lishi kerak.

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KERAMIK MAHSULOTLARINING TUZILISHI VA XUSUSIYATLARI

Annotatsiya: *Ushbu maqolada keramik mahsulotlarining tuzilishi va xususiyatlari ko`rib chiqilgan va tahlil qilingan.*
Kalit so'zlari: *keramik materiallar, sopol buyumlar, sopol toshlar, ichi g'ovakli g'isht, yengil g'isht.*

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STRUCTURE AND PROPERTIES OF CERAMIC PRODUCTS

Annotation: *This article reviews and analyzes the structure and properties of ceramic products.*
Key words: *ceramic materials, ceramic products, ceramic stones, porous bricks, lightweight bricks.*

Keramika materiallari kompozitsion materiallar bo'lib, unda matritsa yoki uzluksiz faza sovutilgan eritma bilan ifodalanadi va dispers faza loy, chang va qum fraktsiyalarining eritilmagan zarralari, shuningdek havo bilan to'ldirilgan teshiklar va bo'shliqlar bilan ifodalanadi.

Matritsa materiali, o'z navbatida, matritsadan tashkil topgan mikrokompozitsiya materialidir - muzlatilgan eritmaning uzluksiz shishasimon fazasi va dispers faza - sillimanit, mullit, turli fraktsiyalarning kremniy dioksidi va sovutish paytida kristallanadigan boshqa moddalarning kristalli donalari (asosan aluminosilikatlar).

Shishasimon, amorf faza (o'ta sovutilgan suyuqlik) mikrostrukturada eritmaning ma'lum bir sovutish tezligida kristallanishga ulgurmagan past eriydigan komponentlar bilan ifodalanadi.

Keramika materiallarining haqiqiy zichligi 2,5 - 2,7 g/sm; zichligi 2000-2300 kg/m; mutlaqo zich parchaning issiqlik o'tkazuvchanligi 1,16 V/(m °C). Keramika materiallarining issiqlik sig'imi 0,75-0,92 kj/(kg °C).

Keramika mahsulotlarining siqilish kuchi 0,05 dan 1000 MPa gacha o'zgaradi.

Keramika materiallarining suvning singishi g'ovaklikka qarab 0 dan 70% gacha o'zgaradi.

Seramika materiallari sovuqqa chidamliligi bo'yicha markalarga ega: 15; 25; 35; 50; 75 va 100.

Devor mahsulotlari guruhiga quyidagilar kiradi: oddiy keramik g'isht, samarali keramik materiallar (ichi bo'sh g'isht, gözenekli ichi bo'sh, engil, ichi bo'sh toshlar, bloklar va plitalar), shuningdek g'isht va keramik toshlardan yasalgan katta o'lchamdagi bloklar va panellar.

Keramika g'ishtlari va toshlari

Seramika g'ishtlari va toshlari qo'shimchalar bilan yoki ularsiz past eriydigan loydan tayyorlanadi va bino va inshootlarning tashqi va ichki devorlarini va boshqa elementlarini yotqizish, shuningdek devor panellari va bloklarini ishlab chiqarish uchun ishlatiladi.

Hajmiga qarab g'isht va toshlar turlarga bo'linadi:

- oddiy;
- qalinlashgan;
- modulli;
- oddiy tosh;
- kengaytirilgan;
- modulli;
- bo'shliqlarning gorizontal joylashuvi bilan.

G'isht to'la va ichi bo'sh bo'lishi mumkin, toshlar esa faqat ichi bo'sh bo'lishi mumkin. Qalinlashgan va modulli g'isht, shuningdek, bitta g'ishtning massasi 4 kg dan oshmasligi uchun faqat dumaloq yoki bo'shliqli bo'shliqlar bilan bo'lishi kerak.

Yuzlarning yuzasi silliq va yivli bo'lishi mumkin.

G'isht va tosh odatda yoqib yuborilishi kerak, chunki yoqilmagan (qizil rang) etarli kuchga ega emas, suvga chidamliligi va sovuqqa chidamliligi past, kuygan g'isht (temir javhari) zichligi, issiqlik o'tkazuvchanligi oshishi bilan ajralib turadi va qoida tariqasida buzilgan shaklga ega.

Dumaloq radiusi 15 mm gacha bo'lgan yumaloq burchakli g'isht va toshlarni ishlab chiqarishga ruxsat beriladi.eng kichik diametrdagi silindrik bo'shliqlarning o'lchami kamida 16 mm, bo'shliq bo'shliqlarining kengligi 12 mm dan oshmasligi kerak. bo'sh bo'lmagan bo'shliqlarning diametri cheklanmagan.

G'isht va toshlarning tashqi devorlarining qalinligi kamida 12 mm bo'lishi kerak.tashqi ko'rinishida g'isht va tosh ma'lum talablarga javob berishi kerak.

Bu har bir partiyadan ma'lum miqdordagi g'ishtni tekshirish va o'lchash orqali o'rnatiladi (0,5%, lekin kamida 100 dona) belgilangan o'lchamlardan og'ish, qirralar va yuzlarning to'g'riligi, burchaklar va qirralarning sinishi, g'isht to'shagidan o'tadigan yoriqlar mavjudligi.

Ruxsat etilganidan yuqori og'ishlarga ega mahsulotlarning umumiy soni 5% dan oshmasligi kerak.

G'isht va toshlarning sovuqqa chidamliligi 15, 25, 35 va 50. To'liq g'isht uchun suvni singdirish 150 dan kam bo'lmagan 8% gacha bo'lgan markalar uchun, yuqori markadagi to'liq g'isht va ichi bo'sh mahsulotlar uchun esa kamida 6% bo'lishi kerak.

Quruq holatdagi zichlikka ko'ra g'isht va toshlar 3 guruhga bo'linadi:

- oddiy-zichligi 1600 kg/m dan ortiq;
- shartli samarali-zichligi 1400-1600 kg/m dan ortiq;

- samarali-zichligi 1400-1450 kg/m dan oshmaydi.

Samarali devor materiallari, shuningdek, diatomitlar va trepellardan tayyorlangan va zichlikka ega bo'lgan gözenekli qattiq va ichi bo'sh g'isht va toshlarni o'z ichiga oladi: a sinf - 700-1000 kg/m, b sinf - 1001-1300 kg/m, b sinf \ u003e 1301 kg/m.

Samarali devor seramika materiallaridan foydalanish tashqi devorlarning qalinligini kamaytirishga, o'rab turgan tuzilmalarning moddiy sarfini 40% gacha kamaytirishga, transport xarajatlari va taglik yuklarini kamaytirishga imkon beradi.

Masalan, Germaniyada "devor g'ishtlari" standarti ishlab chiqarishni nazarda tutadi: o'lchamlari 240x115x52-490x300x238 M40 dan M280 gacha va zichligi 1200-2200 kg/m(3) bo'lgan 14 turdagi oddiy to'liq va ichi bo'sh g'isht va toshlar; M20 dan M280 gacha bo'lgan 13 o'lchamdagi engil ichi bo'sh g'isht va toshlar 600-1000 kg / m (3); M360, M480 va M600 markali yuqori quvvatli g'isht va toshlar: ichki devorlar va bo'limlar uchun - o'lchamlari 330x175x40-945x320x115 bo'lgan ichi bo'sh g'isht, tosh va plitalar.

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SILIKAT BUYUMLAR UCHUN XOM ASHYO VA MATERIALLAR

Annotatsiya: *Ushbu maqolada silikat buyumlar uchun xom ashyo va materiallar xususiyatlari ko`rib chiqilgan va tahlil qilingan.*
Kalit so'zlari: *silikat materiallar, sopol buyumlar, sopol toshlar, ichi g'ovakli g'isht, yengil g'isht.*

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RAW MATERIALS AND MATERIALS FOR SILICATE PRODUCTS

Annotation: *This article reviews and analyzes the properties of raw materials and materials for silicate products..*
Key words: *silicate materials, ceramic products, ceramic stones, porous bricks, lightweight bricks.*

Silikat buyumlar deb oxak yoki undan tayorlangan boshqa bog'lovchi materiallar, giltuproqli qushimchalar , qum va suv aralashmasining qoliplash va keyinchalik avtoklavda ishlash natijasida olinadigan buyumlarga aytiladi.

Oddiy sharoitda (xavoda qotganda) oxak bilan kum reaksiyaga kirishmaydi va materialning mustaxkamligi kichik (1 + 2 MPa) buladi.

1880 y nemis olimi Mixaelis oxak qum aralashmasidan presslab tayorlangan buyumlarni avtoklavda 170º va 0,8 MPa va undan yuqori rejimda ishlov berish yuli bilan mustaxkam material olish usuli ixtiro qilindi.

Bunday sharoitda qumdagi Sio2 ximiyaviy yega bulib oxak bilan reaksiyaga kirishadi va kalsiy gidrosilikat xosil kiladi.

$Sa(ON2)+SiO2+nH2O \rightarrow CaO \cdot SiO2(n+1)H2O$

Silikat buyumlarga siliat g'isht, silikat betonlar betonlar kiradi. Olimlar: Budnikov, Vajenov, Voljenskiy va boshqalar.

Devorbop materiallar orasida silikat g'isht va bloklar asosiy urinlardan birini yegallaydi. Qurilayotgan binolarning 15-20% da silikat g'isht ishlatiladi. Ayniqsa gisht ishlab chiqarish samaradorligi yuqori buladi.

Silikat g'isht va bloklar ishlab chikarish quyidagi texnik iqtisodiy afzalliklarga ega: ishlab chikarish texnologiyasi sodda, mexanizatsiyalashtirish darajasi yuqori, elektr energiya issiklik sarfi, ishchi kuchi sarfi oz, maxsulotning tannarxi oddiy loy g'ishtga nisbatan 2 barobar arzonga tushadi ishlab chiqarish jarayoni 5-10 marta tezroq boradi.

Silikat g’isht ishlab chikarish korxonalarini samaradorligini oshirishning asosiy yullari – ishlab chiqarish siklini kamaytirish, maxsulot sifatini yaxshilash va x.k.

Silkat g’isht ishlab chiqarish uchun xom ashyo sifatida kvars kum, oxak va suv ishlatiladi.

1. – rasm. Silikat buyumlari va materiallari

G’ishtning xossalari xom ashyo qumining ximiyaviy, mineralogik tarkiblariga boglik. Bu xossalar silikat massaning preslanish xosalariga ta’sir kiladi.

Donadorlik tarkibiga kura kumlar kuyidagi turlarga bulinadi:

yirik-zarralar ulchami 2-2,5 mm gacha
urtacha -"- 1,0-0,6 mm-gacha
mayda -"- 0,6-0,2 mm gacha
juda mayda -"- 0,2-0,0,5 mm gacha

Qumning donadorlik tarkibi g’ishtning mustaxkamligiga, oxakning sarf bulishiga ta’sir qiladi.

Ishlatiladigan qumning donadorlik tarkibi:

Jadval-4.1

Elak № lari	5,0	2,5	1,25	0,63	0,315	0,14	0,01	0,05
Qoldik miq dori	0	3	4,5	5	9	55,9	10	10

Qum tarkibidagi giltuproq qo’shimchalari 10% dan oshmasligi kerak. Kvars miqdori 50% dan kam bo’lmasligi kerak, organik qo’shimchalar bo’lmasligi kerak.

Oxakning asosiy xossalari:

Tarkibidagi SaO·MdO oksidlar miqdori bilan xarakterlanadi. Oxakning sortlari va sifatiga qarab uning tarkibidagi SaO+MdO miqdori 65% dan 90% gacha bo’lishi mumkin.

Silikat g’isht uchun ishlatiladigan xom ashyoda miqdori qancha ko’p bo’lsa g’ishtning sifati mustahkamligi shuncha yuqori bo’ladi. Shuning uchun ishlatiladigan oxakning aktivligi 70% dan kam bo’lmasligi kerak va u tez so’nadigan bo’lishi kerak.So’ndirish tezligiga ko’ra oxak 3 turga bo’linadi: tez so’nadigan 8 min gacha, o’rtacha so’nadigan 25 min gacha, sekin so’nadigan 25 min dan keyin. Maydalangan (to’yilgan) oxakning mayinlik darajasi: № 2 elakdagi qoldiq 1% dan oshmasligi kerak va № 008 elakdagi qoldiq 10% dan oshmasligi kerak.

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DEVORBOP SILIKAT BUYUMLARNING TURLARI VA XOSSALARI

Annotatsiya: *Ushbu maqolada devorbop silikat buyumlarning turlari va xossalari, xususiyatlari ko`rib chiqilgan va tahlil qilingan.*
Kalit so'zlari: *devorbop silikat materiallar, sopol buyumlar, sopol toshlar, ichi g'ovakli g'isht, yengil g'isht.*

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TYPES AND PROPERTIES OF WALL SILICA PRODUCTS

Annotation: *This article reviews and analyzes the types, properties, and characteristics of wall-mounted silicate products.*
Key words: *wall-mounted silicate materials, ceramic products, ceramic stones, porous bricks, lightweight bricks.*

Bularga silikat g'isht va toshlar devorbop panellar va bloklar kiradi.Silikat g'isht va toshlar ko'rinishi va o'lchamlari bilan bir-biridan farq qiladi.

Ishlatilishiga ko'ra: ular olliy va pardozbop buyumlarga bo'linadi.

Tayyorlash usuliga ko'ra ichi kovakli (kovak to'ldiruvchi) kovakli ichi bo'sh kovakli turlarga bo'linadi.

Pardozbop g'isht va toshlar (lisevыye) – oddiy yuzali yoki bo'yalgan bo'ladi (rangli). Zichligi va issiq o'tkazuvchanlik xossalariga ko'ra g'isht va toshlar 3 guruxga bo'linadi: 1) Samarador g'ishtlarning zichligi 1400kg/m3 gacha, toshlarniki 1450kg/m3 gacha issiq o'tkazuvchanlik koifsenti 0,46 vt/MºS gacha. 2) Shartli samarador g'isht 1401-1600 kg/m3 toshlar 1451-1650kg/m3, issiq o'tkazshvchanligi 0,58 vt/mºS. 3) Oddiy silikat g'isht zichligi 1650kg/m3 dan katta, issiq o'tkazuvchanligi 0,7 vt/m·ºS gacha. Silikat g'isht va toshlar mustahkamligiga ko'ra quyidagi markalarga bulinadi: M. 300, 250, 200, 150, 125, 100, 75. Pardozbop g'ishtning markasi yeng kamida 125, tosh uchun M 100. Sovuqqa chidamligiga ko'ra Mr3 50, 35, 25, 15.

Silikat g'isht – o'lchamlari oddiy g'ishtnikiday. Tarkobi havoli oxak 6-8%, qum 92-94%, suv 7-9%.

Rangi och kulrang, rangli qilib tayyorlash mumkin. Mustahkamligiga ko'ra markalari 75-300. Sovuqqa chidamliligi-15, suv shimuvchanligi 8-16%. O'rtacha zichligi 1800-№ 900kgm3 issiqlik o'tkazuvchanligi 0,82-0,87 vt mºS. Ishlatilishi oddiy loy g'isht kabi lekin nam ko'p bo'lgan va temperatura yuqori bo'lgan joylarda ishlatish mumkin yemas.

Iqtisodiy jixatdan: Issiqlik yoqilg'i 2 marta kam, elektr energiya 3 marta kam, ishchi kuchi 2,5 marta kam sarf bo'ladi. Natijada oddiy loy g'ishtga nisbatan 25-35% arzonga tushadi.

Silikat g'ishtning turlaridan oxak-shlakli, oxak qumli g'isht ishlab chiqariladi. Ularning zichligi 1400-1600 kg m3, issiqlik o'tkazuvchanlik koeffisiyenti λ=0,6-0,7 vt mºS, mustahkamligi 2,5-7,5. Iqtisodiy jixatdan arzon, bog'lovchini sarfi 35-40% ga kam, avtoklavda ishlov berish vaqti qisqaradi, tannarxi 15-20% arzon.

Kovak silikat betonlardan tayorlanadigan devorbop panellar va bloklar.

Sergovak yoki yacheykali betonlarning asosiy ko'rsatkichi o'rtacha zichligiga ko'ra markasi, mustahkamligiga ko'ra sinfi sovuqqa chidamliligi

15, 25, 35, 50, 75, 100.Yacheykali betonlardan buyumlar tayyorlash texnalogiyasi quyidagi bosqichlardan iborat: xom ashyo va materiallarni tayyorlash, armatura karkaslarini o'rnatish, qoliplanadigan massani tayyorlash, buyumlarni qoliplash, avtoklavda yoki bug' kamerada ishlov berish, maxsulot sifatini kontrol qilish.

Xom ashyo sifatida bog'lovchilar-portlandsemend, oxak ishlatiladi; kremnezemli komponent-kvars qum gaz hosil qiluvchi qo'shimcha alyuminiy kley-kanifol, smolasaponin va boshqa navlar. Yacheykali betonlar asosida devorbop panellar va bloklar tayyorlanadi.

Beton va temirbetondan tayyorlangan devorbop bloklar zich silikat betonlar yacheykali betonlar asosida tayyorlanadi.

Ular turar joy binolari,jamoat va ishlab chiqarish binolari, sanoat va qishloq xo'jalik korxonalarida ishlatiladi.

Sergovak betonlardan tayyorlangan bloklar nam rejimda ishlatiladigan binolarda, agressiv muxit ta'sir etadigan joylarda va binolarning sokol va padval qismlarida ishlatilmaydi.

Devorbop silikat buyumlar olish uchun ishlatiladigan silkat massa tarkibidagi oxak miqdori 7-10% (SaOga xisoblangan) Qum yeng yaxshisi kvars qum bo'lib, zarralari 0,2-2mm, tarkibidagi giltuproq 10% gacha cheklangan bo'lishi kerak.

Ishlab chiqarish usuli xom ashyo aralashmalarini namlab presslash va keyinchalik avtoklavda qotirish yo'li bilan olinadi.

Ishlab chiqarish quyidagi bosqichlardan iborat: qumni qazib olish, elaklash, oxakni kuydirish va maydalash qum bilan oxakni aralashtirish va so'ndirish, buyumlarni preslash, avtoklavda ishlov berish.

Oxak qum aralashmasining qanday so'ndirilishiga ko'ra 2xil ishlab chiqarish usuli ishlatiladi: silosli va barabanli usullar.

Eng ko'p tarqalgan silosli usulda oxak bilan qum maxsus siloslarda 4-8 soatda so'ndiriladi.

Barabanli usulda aylanma barabanlarda 0,5 MPa bosim bilan bug' ta'sir ettirib 30-40 min da so'ndiriladi. So'ndirilgan aralashma aralashtirgichlarda qo'shimcha suv bilan aralashtirilib maydalanadi. Silikat g'isht ishlab chiqarishda yana bir asosiy operatsiya qoliplash. Buyumlarning mustahkamligiga presslash bosimi va vaqti, qoliplanadigan massa tarkibidagi mayda dispers zarrachalar miqdori, massaning

namligi. Preslash bosimi 2 marta oshirilsa, qoliplangan buyumning mustahkamligi 35-40% oshadi.

Qoliplash muddatining oshishi ham mustahkamlikni oshiradi. Silikat massa tarkibiga mayda to'yilgan oxak qumli bog'lovchilar (dispers zarrachalar) (solishtirma yuzalari 5000-6000sm2ga) qoliplangan buyumning mustaxkamligi 0,2-0,6 MPaga oshadi. Silikat aralashmalarning qoliplanish namligi 4-8% massaning maydalik darajasi solishtirma yuzasi oshgan sari namlik oshadi. Odatda qoliplanish namligini 5-6% atrofida qabul qilinadi.

Qoliplash paytida buyumning ichiga havo qolishi yomon oqibatlarga olib keladi, bunda buyumlarni mustaxkamligi kamayib yoriqlar paydo bo'lishi ko'payadi. Buning oldini olish uchun aralashmaning donadorlik tarkibi optimal bo'lishi lozim.

Presslash jarayonida ishlatiladigan asosiy texnalogik apparatlarga press, avtomatik joylaydigan moslamalar (avtomatukladchik) vagonlarni itaruvchi apparat (tolkatel) va elektrlari kiradi.

Silikat g'isht va toshlarni ichi kovakli qilib tayyorlash mumkin. Bunda xom ashyo issiqlik energiya resurslarini tejash va buyumlarni issiq o'tkazuvchanligini kamaytirish mumkin. Keyingi 1% yillarda devorbop silikat buyumlar ishlab chiqaradigan korxonalarda ichi kovakli toshlar (250 3mm, 120 2mm 138 2mm) ishlab chiqariladi. Teshiklar toshning yotiq (potel) tomoniga perpendikulyar joylashgan bo'lib silindr, kanus shaklida qilinadi, ular buyumning bir tomonida bug' ikkinchi yuzasiga o'tmaydi.

Ichi kovakli toshlarni ishlab chiqarishda xom ashyo samaradorligi 20-25%ga kamayadi, elektr energiyasi kamroq sarf bo'ladi presning unumdorligi 1,5 marta oshadi.

1-rasm Avtoklavda ishlov berilgan silikat buyum va materiallar

Avtoklavda ishlov berish Bunda buyumlarga bug' yorvadamida ishlov beriladi. Natijada kalsiy gidrosilikatlari xosil bo'lib suniy tosh silkat g'isht hosil bo'ladi. Bu texnalogik jaryoning yeng asosiy bosqichi hisoblanadi.

Kerakli mustahkamlikka ega bo'lgan g'ishtlarni olishga optimal temperaturada(t=175^{0}S,r=1,2MPa) 4-5 soat kerak.(to'la sikl 8-12 soat, bosim 0,8-1,6 MPa). Temperaturani 203^{0}ga (r=1,6MPa) ko'tarish mumkin.

Silikat g'isht ishlab chiqarishda ishlatiladigan avtoklavning diametri 2m, uzunligi 19, 21m bosim 0,8va 1,2 MPa bulganda va 40m bosim 1,6 MPa.

Avtoklavda ishlov berish uchun buyumlar vagonlarda yuklanadi va avtoklavda maxsus moslamalar yordamida itarib kiritiladi (pri pomoshi tolkatelya). Uzunligi 19 va 21m avtoklavlar odatdagi g'ishtlarni yoki 2 marta g'ishtlarga ishlov berish uchun ishlatiladi. Qoliplangan buyumlarning namligi 6% avtoklavda ishloa vaqti buyumlarning turiga qarab har xil bo'ladi. Pardozbop silikat g'isht olish uchun yuza tomoni rangli qismda ishlatiladigan massaga ishqorlarga chidamli pigmentlar qo'shiladi.

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O‘ZBEKISTON SHAXARLARIDA O‘RTA QAVATLI TURAR JOY BINOLARNING RIVOJLANISH BOSQICHLARI

Annotatsiya: *Ushbu maqolada O‘zbekiston shaxarlarida o‘rta qavatli turar joy uylarning rivojlanish tarixi va arzon uy-joylar barpo etish bo‘yicha matssadli dasturlarni amalga oshirish, axolining hayot sharoitlari yaxshilanishini ta’minlovchi yo‘l-transport, muuandislik-kommunikatsiya va ijtimoiy infratuzilmani rivojlantirish uamda modyernizatsiyassilish ko`rib chiqilgan.*
Ka’lit so’zlari: *modernizatsiyalash, uy-joylar, kommunikatsiya, xalq uylari.*

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STAGES OF DEVELOPMENT OF MEDIUM-RISE RESIDENTIAL BUILDINGS IN CITIES OF UZBEKISTAN

Annotation: *Modernization of road transport, engineering-communication and social infrastructure, which ensures the improvement of the living conditions of the population, is considered in the context of the implementation of large-scale programs for the construction of affordable housing.*
Key words: *Housing, communication, modernization, public houses.*

O‘zbekistonning Xalq me’morchiligi uzining tabiiy-iqlimiy sharoitlaridan, madaniyatidan, milliy mayishiy an’alardan va qurilish moddiy texnikaviy bazasidan kelib chiqqan xolda rivojlanib keldi. Ilgari O‘zbek oilalarining ijtimoiy sharoitlari uylarda ichkari va tashqari xovlilar bo‘lishini taqozo etgan.

Tashqari xovlida barcha xizmatga doir ishlar, uchrashuvlar, xo‘jalik ishlab chiqarish va tadbirkorlik ishlari amalga oshirilsa, ichkari xovlida esa oilaviy xayot turmush tarzi kechirilgan. Baxor va kuz faslining yoqimli, yozning jazirama issiq kunlari ochiq xavoda vaqtning ko‘prok qismi utqazishiga qulay imkon buladi. An’anaviy Xalq uylarining o‘ziga xosligi shundaki, birinchi galda Yuqori radiotsiyali quyosh nurlaridan ximoya kilinsa, ikkinchidan issiq garmisel shamollaridan ximoya qiladi[1].

Xalq me’morlari, binokorlari tmonidan keng kulamli strukturalar va ularning elementlari, yashash xonadonlarining xajmiy keng maydonli bo‘lishi, iqlimiy talablari tufayli ishlab chiqilgan. Ochiq keng xovli bo‘ylab xonalarning joylashtirish tartibi xam iqlimiy sharoit va turmush tarzi talablardan kelib chikadi. Tasodifiy o`zgarishlar, uchastkalarning shakliga, qurilishiga uncha ta’sir ko‘rsatmagan. Bunga uxshash kichik chekinishlar asosiy loyixalashtirish tamoillardan chetga chiqishga

yo‘l kuya olmaydi. Bu prinsip shundan iboratki, keng kulamli turar joy kompozitsiyalarining asosini tashqi va ichki xovlilar tashqil etadi. O‘zbekistonning issiq va kuruk iqlimida Xalq uylarining keng kulamli strukturalarida tashqil etilishiini taxlil qilish shuni kursadaki, Xalq imorotlarining funksiyaonal va texnlogik bog`likligini asoslarini yaxlit sistema tashqil etgan:

Xona+ daxliz+ ayvon + xovli + ishlab chiqarish+darvoza xona+uy

SHunday uslublardan biri - Xorazm uylarining oldida ullu ayvonlar qurilishi, maxsus darvozaxonalarning «Dalon» kulamli keng qismli bo‘lishidir; ikki taraflama yorug tushadigan yozgi xonalar, baland ayvonlar galyereyasi (6.m), darvozaxonalar va tagxonalar Buxoracha qurilish uslubidir; Fargonada an’anaviy uylarning markaziy «kashkarcha» yozgi xonalari; Toshkentda soyabon, Jizzaxda mexmonxonaning yonidan aloxida qurilgan xashamatli ochiq ayvon mexmonxona oldida ayvonlar galyereyasi 90^0 burchak ostida va darvozaxonalar o‘ziga xos uslubilarga misol bula oladi[2].

Asosiy xajmiy-rejalashtirish usullar respublika rayonlarida turar-joy va imorat ko‘rish muammolarining xal etilishiga ijobiy ta’sir ko‘rsatadi va xar bir voxa uchun o‘ziga xos va mos uylar turlari yaratilgan. Xorazm va Quyi Zarafshon mintaqalarining kuruk issiq iqlimi sharoitida bunyod etilgan turarjoy binolari xar xil shakldagi, balandlikdagi, ichki kenglik kompozitsiyalaridagi Xalq uylarining turlari uchraydi. Bu binolar loyixasi imkoni boricha quyosh nurlarining radiatsiyasidan, kuchli garemsellardan, chang tuzonli va kum - tuzonli shamollardan ximoya qilishga. qaratilgan [3-4].

Buxoro va Xorazm qishloq va shaxarlarida xovli - saxni an’anaviy uylarning qulayligi bilan qo‘shilib yaxlitlikni tashqil etishni ta’minlagan. Buxoro an’anaviy Xalq uylarning xovlilari ko‘pchilik xollarda sugorilmaydi, lekin xovli, ko‘kalamzorlashtiriladi, xamda kichik gulzor maydonchalar tashqil etiladi. Bu Xorazm uylari xovlilarida bir tup daraxt bilan kichik gulzorlardan iborat. SHaxarlarda uy qurilishlari ko‘lamining loyixalashtirilishi juda sodda va oddiy bulib, shu xududning tabiiy iqlimiy sharoitlariga mos keladi. I va II rayonlarada turt tomondan imorotlar bilan yopiq xoldagi xovlilar kompozitsiyasi asosiy tizilma bulib xisoblanadi. II rayonda shuningdek turar joy ancha keng, yerkin kompozitsiyalari - ikki taraflama binoli xovlilar uning asosi xisoblanadi. Xalq me’morlarining, ustalarining turar-joy qurilish uslublari issiq kunlarda soya-salkin, syershamol bo‘lishini, chang tuzonlaradan ximoya qilib turishini, muximi shinam, qulay mikroiqlim yaratilishiga asoslanadi.

I. tip. Xorazm an’anaviy Xalq uylarning xajmiy-rejaviy elementlari quyidagi bloklar gurux va elementlaridan iborot: 1 -bosh mexmonxona «saroy» oldida ullu ayvon va qarama-karshisida tyers-ayvon, bu imorotlarning asosiy uki shimol tomonga aniq yunaltirilgan. Ullu- ayvonning balandligi 6 m buladi, kolgan barcha xonalar va tyers ayvonlar- bir qavatli. Ko‘pincha binolarning ustida galyeriyalar va «Kazana» omborxonasi qurilgan. Xorazmcha xamma uylarning qurilishida shu tamoyil asosida qurilgan. Mexmonxona «Saroy» va Ullu-ayvon balandligi bilan boshqa xonalardan ajralib turadi va u eng asosiy element xisoblanadi.

P.tip. Buxoro an’anaviy uylar tuzilishi quyidagi elementlardan iborat: 6 metr balandlikdagi 4 ustumli ayvon va bosh yozgi mexmonxona «tabiston» ikki tomonida daxliz va yotoqxona, 2-yashash xona «zimiston»,

*SS*55 -Lyonida daxliz va madan 3-ta yashash xonalari va o‘rtada daxliz joylashgan. Buxoro an’anaviy Xalq uylarining xajmiy-keng kulamli uy- joy qurilishining o‘ziga xosligi shundaki: Xovlining shimoliy-janubiy ukida bir-biriga qarama-karshi tomonida joylashgan yozgi va kishki xonalar guruxi, xovlining shark va garb tomonida kishki yashash xonalari joylashtirilgan. Buxoro an’anaviy uy ko‘rish rejasi - ichki xovlilar bo‘ylab imorat solish, Xorazm an’anaviy uy-joy ko‘rish tizimiga uxshaydi. Lekin farqi shundaki, Buxoraa qurilish tuzilishi keskin farq bulib, yozgi va kishgi xonalar ajralib turadi. SHuning bilan birga yozgi xonalar shimol tomonga aniq yunaltirilgan. Kishgi xonalar janub tomonga aniq yunaltirilgan buladi. Kishgi xonalar tez isitilishi uchun ko‘pincha past qilib kurilib, bu xonalar balandligi 2,75 m dan 3 metrgacha buladi. Buxoro an’anaviy uy-joy ko‘rishning xaraktyerli tomoni shundaki, qisman yoki butun binolar bo‘ylab tagxonalar - yer tulaning qurilishidir. Tagxona bosh mexmon xonanining ostida kurilib, oldida maydon tashqil etilib, tarnovlar xam shu tomonga qaratilgan. YOzgi oshxona xam shu supachada joylashtirilgan, xavo oqimi tagxona orqali utib, xovliga salkinlik baxshida etish uchun qulay bo‘lgan. Bundan tashqari tagxonalar poydevor vositasidan tashqari binolar devorlarining namlanish va shurlanishidan asragan. Fargona, CHirchiq- Angren, O‘rta Zarafshon vxalarida uy-joy binolari ikki xovlili xovli bulib 2 - 3 - tomonlama kurilib, ko‘kalamzorlashtirilgan va suv oqimi kirishi uchun qulay sharoit yaratilgan [5].

SH.tip. Jizzax an’anaviy uy-joy ko‘rish tizimining elementlari quyidagicha: yashash xonalari yoki qator xonalar va daxlizi bilan; bu xonalarni birlashtirib turuvchi 90° ostida qurilgan ayvon. 1U-qator xonalar va oldida uzunasiga 3-6 ustumli ayvon joylashtirilgan; Jizzax an’anaviy uy-joy qurilishi tizimining tipik belgilari xovlilar bo‘ylab 2 yoki 3 tomonida yashash xonalarning joylaytirilishidir. O‘rta Zarafshon xududlari uy-joy qurilishiga keskin talablar quyiladi. Eng yaxshi orientatsiya janubiy va janubi- sharkiy yo`nalishi xisoblanadi (rasm 19,20).

IV- tip. Fargona an’anaviy uy-joy ko‘rish tizimining xajmiy- rejaviy elementlari quyidagilardan iborat:

1 - markaziy yozgi xona - «kashkarcha», yonidan xonalar; II - markaziy xonaning tashqi tomonida ikki tabakali ochiladigan devor «tabodon» va

oldida supa, yonida xonalar qurilgan.

Fargona an’anaviy qurilishning o‘ziga xos xaraktyerli tomonlaridan biri «Kashkarcha» yozgi xonaning old tomonidagi ochilib yopiladigan «tobodon» devoridir. (pyeregorodka). Toshkent, Fargona, O‘rta Zarafshon va CHirchiq mintaqalarida an’anaviy uylarda xovlilarni uchun kukamalamzorlashtirish muxim rol o`ynaydi. Ayniqsa, uzining chiroyli barglari bilan, chirmashuvchanligi bilan tut daraxti xisoblanadi. Xar bir ayvon oldiga tok eqilib, ishkomlar tabiiy ayvon vazifasini xam utaydi. Ichki va tashqi kenglik bir tekis va tartib bilan amalga oshiriladi. Xalq uylarida mikroiqlim tabiiy xolda ko‘kalamzor va suv chiqarish yo‘li bilan tartibga solib turiladi. Xalq tajribasi birqator sistemani yaratadiki, bu xovlilar

o‘rtasida «xovuz» va xovuz bo‘ylab gullar, kukat eqilishi, mevali daraxtlar va uzumning eqilishi shaxar turar - joy imorat qurilishida kullanilmokda. YAxshi soya-salkin qilingan xovlilar tempiraturasi 4°-5° daraja pasayib, xavo namligi 1728% gacha kutariladi. Bunday ko‘kalamzorlashtirilgan, daraxtlar eqilgan xovlilar tuni bilan salkinlashib, kunduzi esa atrofdagilarni issiq quyosh taftidan asrab turadi.

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ENERGIYA TEJAMKOR KO‘P QAVATLI TURAR JOY UYLARNI LOYXALASH

ANNOTATSIYA: *Arzon uy-joylar barpo etish bo‘yicha maqssadli dasturlarni amalga oshirish, axolining hayot sharoitlari yaxshilanishini ta’minlovchi yo‘l-transport, muuandislik-kommunikatsiya va ijtimoiy infratuzilmani rivojlantirish hamda modyernizatsiya qilish ko`rib chiqilgan.*

Ka’lit so’zlari: *Uy-joylar, kommunikatsiya, modernizatsiyalash, xalq uylari.*

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DESIGN OF ENERGY-EFFICIENT MULTI-STORY RESIDENTIAL BUILDINGS

Annotation: *The implementation of targeted programs for the construction of affordable housing, the development and modernization of road, transport, engineering, communication and social infrastructure, ensuring the improvement of the living conditions of the population, were considered.*

Key words: *Housing, communication, modernization, public houses.*

O‘zbekiston an’anaviy Xalq uylarining rejalashtirishdagi ko‘lami, tizimini xajmiy-fazoviy tuzilishini tekshirish va o‘rganish maqsadida Xorazm, Buxoro va Jizzax viloyatlari qishloq va shaxaralari tanladi, chunki aynan shu qishloq va shaxarlarda an’anaviy Xalq uylarning o‘ziga xos turlari Xalq tomonidan yaratilgan. Muallif maxalliy tabiiy - iqlim sharoitlarini xisobga olgan xolda kuriladigan qishloq uylari xovlili turar joylarni loyixalash bo‘yicha Xalq an’anaviy uylarini o‘rganish bo‘yicha uslubiyatini ishlab chiqildi. An’anaviy uylarda me’moriy qurilish an’analarini, ma’ishiy va badiiy vositalarini, xayot kechirish tarzini, avlodlar boy tajribalarini uzida mujassam etgan. Ikkinchidan Respublikamiz tabiiy - iqlimiy sharoitida qishloq Turar joy uylarini loyixalash va qurilishini kompleks taxlil qilindi[1].

O‘zbekiston Respublikasi Prezidentining 2017 yil 7 fevraldagi PF-4947-sonli Farmoniga ko`ra 2017 — 2021 yillarda O‘zbekiston Respublikasini rivojlantirishning beshta ustuvor yo`nalishi bo‘yicha Xarakatlar strategiyasining, IV Ijtimoiy soxani rivojlantirishning ustuvor yo`nalishlaridan biri:

Arzon uy-joylar barpo etish bo‘yicha matssadli dasturlarni amalga oshirish, axolining uayot sharoitlari yaxshilanishini ta’minlovchi yo‘l-transport,

muuandislik-kommunikatsiya va ijtimoiy infratuzilmani rivojlantirish uamda modyernizatsiyassilish:

-axoli, eng avvalo, yosh oilalar, eskirgan uylarda yashab kelayotgan fuqarolar va uy-joy sharoitini yaxshilashga muxtoj boshqa fuqarolarning yashash sharoitini imtiyozli shartlarda ipoteka kreditlari ajratish xamda shaxar va qishloq joylarda arzon uylar ko‘rish orqali yanada yaxshilash;

-axolining kommunal-maishiy xizmatlar bilan ta’minlanish darajasini oshirish, eng avvalo, yangi ichimlik suvi tarmoklarini ko‘rish, tejamkor va samarali zamonaviy texnologiyalarni boskichma-boskich joriy etish orqali qishloq joylarda axolining toza ichimlik suvi bilan ta’minlashni tubdan yaxshilash;

-odamlarning ekologik xavfsiz muxitda yashashini ta’minlash, maishiy chiqindilarni kayta ishlash komplekslarini ko‘rish va modyernizatsiya qilish, ularning moddiy-texnika bazasini mustaxkamlash, axolini chiqindini yuk qilish bo‘yicha zamonaviy ob’ektlar bilan ta’minlash;

-axoliga transport xizmati ko‘rsatishni tubdan yaxshilash, yo‘lovchi tashish xavfsizligini oshirish va atrof muxitga zararli moddalar chiqishini kamaytirish, xar tomonlama qulay yangi avtobuslarni sotib olish, avtovokzal va avtostansiyalarni ko‘rish xamda rekonstruksiya qilish;

-yo‘l infratuzilmasi qurilishi va rekonstruksiya kilinishini davom ettirish, eng avvalo, mintaqaviy avtomobilь yo‘llarini rivojlantirish, xo‘jaliklararo qishloq avtomobil yo‘llarini, axoli punkti ko‘chalarini kapital va joriy ta’mirlash;

-yangi elektr enyergiya ishlab chiqarish kuvvatlarini ko‘rish va mavjudlarini modyernizatsiya qilish, past kuchlanishli elektr tarmoklari va transformator punktlarini yangilash asosida axolini elektr enyergiyasi xamda boshqa yokilgi-enyergiya resurslari bilan ta’minlashni yaxshilash, shuningdek, kayta tiklanadigan enyergiya manbalaridan foydalanishni kengaytirish bo‘yicha chora-tadbirlarni amalga oshirish;

-teatr va tomosha maskanlarini, madaniy-ma’rifiy tashqilotlar va muzeylar faoliyatini rivojlantirish xamda takomillashtirish, ularning moddiy-texnika bazasini mustaxkamlash[2].

An’anaviy Xalq uylarining xajmiy - rejaviy tuzilishi ularning tizimida xo‘jalik tadbirkorlik va ishlab chiqish.

O‘zbekistonning Xalq me’morchiligi uzining tabiiy-iqlimiy sharoitlaridan, madaniyatidan, milliy mayishiy an’alardan va qurilish moddiy texnikaviy bazasidan kelib chiqqan xolda rivojlanib keldi. Ilgari O‘zbek oilalarining ijtimoiy sharoitlari uylarda ichkari va tashqari xovlilar bo‘lishini taqozo etgan.

Tashqari xovlida barcha xizmatga doir ishlar, uchrashuvlar, xo‘jalik ishlab chiqarish va tadbirkorlik ishlari amalga oshirilsa, ichkari xovlida esa oilaviy xayot turmush tarzi kechirilgan. Baxor va kuz faslining yoqimli, yozning jazirama issiq kunlari ochiq xavoda vaqtning ko‘prok qismi utqazishiga qulay imkon buladi. An’anaviy Xalq uylarining o‘ziga xosligi shundaki, birinchi galda Yuqori radiotsiyali quyosh nurlaridan ximoya kilinsa, ikkinchidan issiq garmisel shamollaridan ximoya qiladi[3].

Xalq me’morlari, binokorlari tmonidan keng kulamli strukturalar va ularning elementlari, yashash xonadonlarining xajmiy keng maydonli bo‘lishi, iqlimiy talablari tufayli ishlab chiqilgan. Ochiq keng xovli bo‘ylab xonalarning joylashtirish tartibi xam iqlimiy sharoit va turmush tarzi talablardan kelib chikadi. Tasodifiy o`zgarishlar, uchastkalarning shakliga, qurilishiga uncha ta’sir ko‘rsatmagan. Bunga uxshash kichik chekinishlar asosiy loyixalashtirish tamoillardan chetga chiqishga yo‘l kuya olmaydi. Bu prinsip shundan iboratki, keng kulamli turar joy kompozitsiyalarining asosini tashqi va ichki xovlilar tashqil etadi. O‘zbekistonning issiq va kuruk iqlimida Xalq uylarining keng kulamli strukturalarida tashqil etilishiini taxlil qilish shuni kursadaki, Xalq imorotlarining funksiyaonal va texnlogik bog`likligini asoslarini yaxlit sistema tashqil etgan:

Xona+ daxliz+ ayvon + xovli + ishlab chiqarish+darvoza xona+uy

SHunday uslublardan biri - Xorazm uylarining oldida ullu ayvonlar qurilishi, maxsus darvozaxonalarning «Dalon» kulamli keng qismli bo‘lishidir; ikki taraflama yorug tushadigan yozgi xonalar, baland ayvonlar galyereyasi (6.m), darvozaxonalar va tagxonalar Buxoracha qurilish uslubidir; Fargonada an’anaviy uylarning markaziy «kashkarcha» yozgi xonalari; Toshkentda soyabon, Jizzaxda mexmonxonaning yonidan aloxida qurilgan xashamatli ochiq ayvon mexmonxona oldida ayvonlar galyereyasi 90^0 burchak ostida va darvozaxonalar o‘ziga xos uslubilarga misol bula oladi[3].

Asosiy xajmiy-rejalashtirish usullar respublika rayonlarida turar-joy va imorat ko‘rish muammolarining xal etilishiga ijobiy ta’sir ko‘rsatadi va xar bir voxa uchun o‘ziga xos va mos uylar turlari yaratilgan. Xorazm va Quyi Zarafshon mintaqalarining kuruk issiq iqlimi sharoitida bunyod etilgan turarjoy binolari xar xil shakldagi, balandlikdagi, ichki kenglik kompozitsiyalaridagi Xalq uylarining turlari uchraydi.

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DEVELOPMENT OF ENERGY EFFICIENT MID-RISE RESIDENTIAL HOUSES

Annotatsiya: Ushbu maqolada ishlab chiqarishni maxalliylashtirishni rag'batlantirish siyosatini davom ettirish xamda, eng avvalo, iste'mol tovarlar va butlovchi buyumlar importining o'rnini bosish, tarmoqlararo sanoat kopyeratsiyasini kengaytirish bayon qilingan.

Kalit so'zlar: *turar-joy binolari, blok kvartira, metodik klassifikatsiya.*

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ENERGIYA TEJAMKOR O'RTA QAVATLI TURAR JOY UYLARNI RIVOJLANTIRISH

Abstract: *The article describes the continuation of the policy of promoting the localization of production, and, first of all, the substitution of imports of consumer goods and components, and the expansion of cross-sectoral industrial cooperation.*

Key words: *residential buildings, apartment block, methodical classification.*

O'zbekiston Respublikasi bozor iqtisodiyotiga o'tish jarayonini va bu jarayon qishloq axolisini turmush darajasiga xam katta ta'sir ko'rsatmokda. Qishloqlarda katta va kichik Fermer xo'jaliklari, kichik biznes, xususiy tadbirkorlik ishlab chiqarish korxonalari va xokazolar paydo bulmoqda. Bular o'z navbatida qishloq axolisining turmushi yaxshilanishiga olib keladi va o'z navbatida turar joy binolarini strukturasini birmuncha o`zgarishiga olib keladi. Masalan: katta fermer xo'jaliklarida esa molxona, tovukxona va samonxonalar turar joy binolarini birga ishlanib uning katta qismini tashqil qilmoqda. Fermer xo'jaligini boshqarib unda ishlaydigan oila a'zolari xar kuni ishga borib kelish uchun ma'lum vaqt sarflaydilar. Ishning yaxshi borishi uchun ularning yashash joylari fermaga yaqin joyda bo'lishi ma'qul bo'lib qoladi. Shunday qilib ferma xo'jaligi atrofida turar joy binolarini ko'riladi. Vaqt o'tishi bilan ferma xo'jaligi kattalashib ishchilar soni ko'payadi, natijada turar joy binolari va agrosanoat majmualari paydo bo'ladi[1].

Sobiq Sovet ittifoq davrida, shaxar turar joy tizimi tarkibidagi, xo'jalik, tadbirkorlik va boshqa turdagi ishlarni jamoat, davlat korxona va tashqilotlariga berilgan edi. Shu sababli oila turar - joyida, oilaning biologik ijtimoiy rivojlanishi, uy-ruzg'or ishlari, dam olish, mexmonlarni kutib olish, marosimlarni o'tqazish kabilar qoldirildi. Bu borada sotsiologik-demografik ilmiy- tadqiqotlar o'tqazilib,

turar joy uylar va ularning kvartiralarini qanday rivojlantirish va narmativlarni aniqlash borasida ishlar olib borilib, turar joylarni loyixalash va ko‘rish bo‘yicha KMK lar yaratildi. Shu KMK lar bo‘yicha kvartira va turar - joylar loyixalandi va qurilishlar amalga oshirild [2,3].

Davlatimiz mustaqillikka erishilgandan keyin, bosh qomusimizda, xamma mulklarga ruxsat berildi. Qishloq va shaxarlarda kvartiralar, uylar privitizatsiya qilinib, xususiylashtirildi. Natijada, Respublikamizning qishloq, tuman markazlari va shaxarlari axolilari xususiy xo‘jalik tadbirkorlik va ishlab chiqarish bilan shug’ullana boshladilar va turar - joylarini shu yo`nalishga moslashtira boshladilar.

Natijada, qishloq va tuman markazlari bu jarayonga to`liq tayyor emasligi ma’lum buldi. Bu jarayonni boshqarish uchun tuligicha me’yoriy xujatlar Respublika arxitektura va qurilish kumitasi, shaxar va tuman xoqimiyatlari tomonidan ishlab chiqilmagan. Rasmlarda keltirilgan faktlardek respublika qishloq va tuman markazlari stixiyali turar joy qurilishini olib bormokdalar.

Shu boisdan ishga an’anaviy xalq uylarida bu masala qanday yechilgani va turar - joy tizimida qanday joylashtirilgan? Bu masalani O‘zbekiston tarixiy shaxarlarining an’anaviy xalq uylari tizimi o‘rganildi, loyixalash va qurilish tajribalari taxlil va xulosalar qilindi.

Ikkinchi bosqichda, xozirgi kunda axolining mexnat faoliyatini turar joylarda olib borishi bo‘yicha ilmiy kuzatishlar o’tqazildi. Natijada mexnat faoliyati turlari bo‘yicha qishloq, tuman markazlari uchun kam qavatli turar joy uylarning turlari aniqlandi:

Xo‘jalik, xo‘jalik-tadbirkorlik, xo‘jalik-ishlab chiqarish, ishlab chiqarish-tadbirkorlik.

Shu yuqorida keltirilgan turar joy uylarning xo‘jalik tiplari zonalari sxemasi (modeli) va o‘rta qavatli uylarning namunaviy tiplarining zonalari sxemasi (modeli) aniqlandi .

Tadqiqot natijalari ko‘rsatadigan maxalliy sharoit (ijtimoiy - demografik, tabiiy - iqlim, moddiy va industrial bazasi va boshqalar,) lar xususiyatidan kelib chiqib Navoiy viloyatida qishloq turar joylarning me’morchilik yechimiga, ya’ni uning xajmiy - rejaviy va xajmiy-fazoviy tashqil etilishi, konstruktiv yechimlarga va butun turar - joy imorat qurilishi muxitini shakllantirishiga o’z ta’sirini ko‘rsatdi.

Tadqiqotlar ko‘rsatadiki, qurilish uslublarini qo‘llash xamda zamonaviy ko‘rish material va konstruksiyalar birgalikda talablar shartlari turar - joy guruxini tashqil etadi. Bu shart va talablar qishloq turar - joylar me’morchiligini aniqlaydi, uning shaxarsozlik xarakatini ta’minlash, qavatlari reja va konfiguratsiyasi, kompozitsiyasi (masshtab, proporsiya, ritm) orentatsiya, insolyasiya kabi masalalarni belgilaydi.

Turar joylarni xajmiy - rejaviy shakllantirish va xajmiy fazoviy tashqillashtirishda tadqiqotlar shuni ko‘rsatadiki asosiy faktor - bu tabiiy - iqlim sharoitlaridir. Ushbu konuniyatning kullanishi, sotsial- demografik, tabiiy-iqlimiy faktorlari turar joy arxitekturada, turar -joy shaxar qurilishida va ularning taraqqiyoti asosida turar- joylarni loyixalash, turar-joylarning rivojlanish istiqboli va yangi avlodlarni ishlab chiqishda mana shu qonuniyatlar yotadi [4].

Shaxar turar - joylarning rejaviy tuzilishi va xajmiy - fazoviy kompozitsiyasini kompleks va sistemali tadqiqot qilish natijasida, ishda, quyidagi tamoillaridan iborat shaxar xovli turar-joylarning arxitekturaviy-rejaviy tuzilishi va xajmiy - fazoviy tashqillashtirish va shakllantirishning asosiy tamoyillari va usullari aniqlandi.

Respublikamizda va chet el xorij mamlakatlari loyixa va tajribalari bo‘yicha, o‘rta qavatli turar-joy uylarning «blok+kvartira+xovli xo‘jalik+tadbirkorlik+ blok-uy» bo‘yicha progressiv turlari aniqlandi.

1.Blok kvartira va sotsial-fazoviy turlari bo‘yicha blok-uy va blok kvartira xamda blok+kvartiralar xo‘jalik bloklarini diffyerensiallash va nomenklaturaga kvartiralarni guruxlab birlashtirib va tashqillashtirish.

2.O‘rta qavatli xovlili turar - joy uylar tadqiq kilinishi natijasida uzimizning va xorij mamlakatlari turar-joyning uylari progressiv blok+kvartira+uylaridan istikbolda turar-joy uylari

omenklaturasini tuzish.

3. Ishlab chiqilgan model asosida o‘rta qavatli xovlili turar-joy uylarini shakllantirish, tashqillashtirish va rivojlantirish talablari aniqlandi.

O‘zbekistonning mintaqaviy maxalliy xududlarining tabiiy-iqlim sharoitlari bo‘yicha turar joylarni loyixalash me’moriy - qurilish ishlarini amalga oshirishda ma’lum bir o’zlarining maxsus talablariga ega. Ya’ni respublika sharoitida doimiy omillardan - tabiiy-iqlim sharoitlaridan quyosh radiatsiyasining yuqori darajasi, tez o`zgaruvchanligi va quruqligi, ammo shu bilan birga regional farqlanishga ega. Bu asosiy faktor respublikaning barcha xududlarida, yozgi davrda xavo xaroratining yuqoriligi, termik muddatning davomiyligi (2-3 oy davom etadi) diskomfortlik sharoitlar xukumronligi xisoblanadi. Shuning uchun bu faktor juda muxim bulib, yoz davrida turar- joylarning kvartira xonalarini va turar - joy imorat qurilishi xududlarini bosh faktorlardan ximoyalash va ularda yangi turi - «o’suvchi uy»ni yaratish imkonini beradi [5].

Taklif kilinayotgan «o’suvchi-uy» - «blok-kvartira+xovli+uy» bir vaqtning uzida 1 -2-qavatli bulib keyingi oilaning sifat o`zgarishi bo‘lganda 3-qavatli xattoki 4-qavatli uylarga aylanishi mumkin. Bundan tashqari, «Blok-kvartira+xovli+uy» birlashtirilayotganda, gorizontal va vertikal kommunikatsiya - galareya-koridorlar ko‘cha tizimiga kiritiladi. Bu tizim uylarni guruxlashtirishning turar- joy majmualari ya’ni maxallani tashkillashtirishda asosiy kompozitsiyaviy usul bo’lib xizmat qiladi.

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ENERGIYA TEJAMKOR O‘RTA QAVATLI TURAR JOY UYLARNI SHAKLLANTIRISH VA TAHLIL QILISH

Annotatsiya: *Ushbu maqolada energo tejamkor o‘rta qavatli turar joy uylarni shakllantirish, iqtisodiyotda enyergiya va resurslar sarfini kamaytirish, ishlab chiqarishga enyergiya tejaydigan texnologiyalarni keng joriy etish, qayta tiklanadigan enyergiya manbalaridan foydalanishni kengaytirish, iqtisodiyot tarmoklarida mexnat unumdorligini oshirish va rivojlantirish xajmiy-rejaviy tamoyillari tahlil qilingan.*

Kalit so`zlar: *energo tejamkor, butlovchi buyumlar, xizmat ko‘rsatish.*

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DESIGN AND ANALYSIS OF ENERGY EFFICIENT MID-RISE RESIDENTIAL HOUSES

Abstract: *This article analyzes the quantitative and planning principles of creating energy-efficient medium-rise residential houses, reducing the consumption of energy and resources in the economy, widely introducing energy-saving technologies in production, expanding the use of renewable energy sources, increasing productivity and development of production in economic networks..*

Key words: *energy efficient, components, service.*

Qishloqlarda katta va kichik Fermer xo‘jaliklari, kichik biznes, xususiy tadbirkorlik ishlab chiqarish korxonalari va xokazolar paydo bulmokda. Bular uz navbatida qishloq axolisining turmush axolisining yaxshilanishiga olib keladi va uz navbatida turar joy binolarini strukturasini birmuncha o`zgarishiga olib keladi. Masalan: katta fermer xo‘jaliklarida esa molxona, tovuqxona va samonxonalar turar joy binolarini birga ishlanib uning katta qismini tashkil qilmokda[1].

Ishlab chiqarishni maxalliylashtirishni rag’batlantirish siyosatini davom ettirish xamda, eng avvalo, iste’mol tovarlar va butlovchi buyumlar importining urnini bosish, tarmoklararo sanoat koopyeratsiyasini kengaytirish;

iqtisodiyotda enyergiya va resurslar sarfini kamaytirish, ishlab chiqarishga enyergiya tejaydigan texnologiyalarni keng joriy etish, qayta tiklanadigan enyergiya manbalaridan foydalanishni kengaytirish, iqtisodiyot tarmoklarida mexnat unumdorligini oshirish;

faoliyat ko‘rsatayotgan yerkin iqtisodiy zonalar, texnoparklar va kichik sanoat zonalari samaradorligini oshirish, yangilarini tashqil etish;

xizmat ko‘rsatish soxasini jadal rivojlantirish, yalpi ichki maxsulotni shakllantirishda xizmatlarning urni va ulushini oshirish, ko‘rsatilayotgan xizmatlar tarkibini, eng avvalo, ularning zamonaviy yuqori texnologik turlari xisobiga tubdan o`zgartirish;

Yakka tartibdagi xo‘jaliklarda esa uz turar joylarida kichik korxonalar tashqil qilish bilan birga turar joy xonadonlarini strukturasini kengaytirmokdalar.

Misol qilib: tashqi xovlida kichik tegirmonlar, ustaxonalar, tikish

- bichishssexlar va boshqalarni tashqillashtirmokda[2].

Yaqin kelajakda qishloq turmush tarzi tubdan o`zgarib yangicha tus olishi mumkin. Fermer xo‘jaliklarining turlariga va ularning kanday ish bilan shugullanishlariga qarab u berda yashaydigan axolining ijtimoiy yashash jarayoni xam o`zgarib boradi. Misol uchun: Qoramol yoki kuy bokish bilan shugullanadigan Fermer xujaligi axolii yashaydigan qishloqdan ma’lum masofada joylashgan buladi.

Fermer xujaligini boshqarib unda ishlaydigan oila a’zolari xar kuni ishga borib kelish uchun ma’lum vaqt sarflaydilar. Ishning yaxshi borishi uchun ularning yashash joylari fyermaga yaqin joyda bo‘lishi ma’kul bulib koladi. SHunday qilib ferma xujaligi atrofida turar joy binolarini kuriladi. Vaqt o‘tishi bilan ferma xujaligi kattalashib ishchilar soni ko‘payadi, natijada turar joy binolari va agrosanoat majmualari paydo buladi. Sobik Sovet ittifok davrida, shaxar turar joy tizimi tarkibidagi, xo‘jalik, tadbirkorlik va boshqa turdagi ishlarni jamoat, davlat korxona va tashqilotlariga berilgan edi. SHu sababli oila turar - joyida, oilaning biologik ijtimoiy rivojlanishi, uy-ruzgor ishlari, dam olish, mexmonlarni kutib olish, marosimlarni utqazish kabilar koldirildi. Bu borada sotsiologik-demografik ilmiy-tadqiqotlar utqazilib, turar joy uylar va ularning kvartiralarini kanday rivojlantirish va narmativlarni aniqlash borasida ishlar olib borilib, turar joylarni loyixalash va ko‘rish bo‘yicha KMK lar yaratildi. SHu KMK lar bo‘yicha kvartira va turar - joylar loyixalandi va qurilishlar amalga oshirild [3].

Davlatimiz mustaqillikka erishilgandan keyin, Bosh qomusimizda, xamma mulklarga ruxsat berildi. Qishloq va shaxarlarda kvartiralar, uylar privitizatsiya qilinib, xususiylashtirildi. Natijada, Respublikamizning qishloq, tuman markazlari va shaxarlari axolilari xususiy xo‘jalik tadbirkorlik va ishlab chiqarish bilan shugullana boshladilar va turar - joylarini shu yo`nalishga moslashtira boshladilar.

Natijada, qishloq va tuman markazlari bu jarayonga to`liq tayyor emasligi ma’lum buldi. Bu jarayonni boshqarish uchun tuligicha me’yoriy xujatlar Respublika arxitektura va qurilish kumitasi, shaxar va tuman xoqimiyatlari tomonidan ishlab chiqilmagan. Rasmlarda keltirilgan faktlardek respublika qishloq va tuman markazlari stixiyali turar joy qurilishini olib bormokdalar.

SHu boisdan ishga an’anaviy Xalq uylarida bu masala kanday echilgani va turar - joy tizimida kanday joylashtirilgan? Bu masalani O‘zbekiston tarixiy shaxarlarining an’anaviy Xalq uylari tizimi o‘rganildi, loyixalash va qurilish tajribalari taxlil va xulosalar kilindi[4].

Ikkinchi boskichda, xozirgi kunda axolining mexnat faoliyatini turar joylarda olib borishi bo‘yicha ilmiy kuzatishlar utqazildi. Natijada mexnat faoliyati turlari bo‘yicha qishloq, tuman markazlari uchun kam qavatli turar joy uylarning turlari aniqlandi: Xo‘jalik, xo‘jalik-tadbirkorlik, xo‘jalik-ishlab chiqarish, ishlab chiqarish-tadbirkorlik. SHu yuqorida keltirilgan turar joy uylarning xo‘jalik tiplari zonalari sxemasi (modeli) va o‘rta qavatli uylarning namunaviy tiplarining zonalari sxemasi (modeli) aniqlandi.

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KALIY POLIFOSFATLARNI KALSIY TARKIBLI MINERALLAR YORDAMIDA NEYTRALLASH MAHSULOTLARI

Annotatsiya: *Ushbu maqolada osforitlardan olingan ekstraksion fosfat kislota tarkibidagi fosfor miqdorining oshirilishi bilan konsentrlashga erishish, bundan fosforli o‘g‘it turlarini, aynan tarkibida kalsiy moddasi bo‘lgan o‘g‘itlarni olish jarayonlari ko‘rsatib berilgan.*

Kalit so‘zlar: *Fosforit, mineral o‘g‘it, neytrallash, konsentrlash, kalsiy, mineral o‘g‘itlar turlari, ammoniy fosfat, superfosfat, fosfat kislota, ekstraksiya.*

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PRODUCTS FOR NEUTRALIZING POTASSIUM POLYPHOSPHATES USING SALTS-CONTAINING MINERALS

Abstract: *This article describes the processes of increasing the phosphorus content of phosphate rock extracted from phosphorites and obtaining phosphorus-containing fertilizers, namely fertilizers containing calcium.*

Keywords: *Phosphorite, mineral fertilizer, neutralization, concentration, calcium, types of mineral fertilizers, ammonium phosphate, superphosphate, phosphoric acid, extraction*

Kirish: Jamiyat rivojlanishi inson omilining rivojlanishi bilan boradi. Qishloq xo‘jaligini rivojlantirish asosida turadigan kimyo sanoatining mineral o‘g‘it ishlab chiqarish tarmog‘i, bular orasida mahalliy fosforitlardan olinadigan fosforli o‘g‘itlar salmog‘i katta bo‘lib hisoblanadi.

Azotli, fosforli va kaliyli mineral o‘g‘it ishlab chiqarish barobarida kompleks holdagi o‘g‘itlar ishlab chiqarishga ham katta e’tibor berilmoqda. Masalan, tarkibida kaliy tutgan fosforli o‘g‘it, tarkibi polifosfat bilan ta’minlangan konsentratsiyasi yuqori bo‘lgan mineral o‘g‘itlar ishlab chiqarish bilan o‘simlik tomonidan o‘zlashuvchan formadagi moddalarga boy bo‘lgan mineral o‘g‘itlar ishlab chiqarish ishlari ham muhim masalalardan biridir. Buni ko‘rsatish uchun ushbu maqolada mahalliy fosforitlardan foydalanildi[1,2].

Tajriba: Dastlab mahalliy Qizilqum fosforitlaridan oddiy laboratoriya sharoitida EFK olindi. Buning uchun oddiy shishadan tayyorlangan reaktor, elektrodvigatelli мешalka va vakuum filtr ыurilmalaridan foydalanildi. Olingan EFK tarkibi kimyoviy va fizik-kimyoviy usullar yordamida tahlil qilindi. Olingan EFKni uch usulda konsentratsiyasi 55 % bo‘lguniga qadar bug‘latildi. Bu usullarda olib borilgan laboratoriya ishlari qat’iy ravishda haroratni nazorat qilib turildi. Laboratoriya ishlari oddiy shisha reaktorli, reaksiya natijasida suvning bug‘lanishiga qarshi suvli sovitgichli, elektrodvigatelli aralashtirgichli laboratoriya qurilmasida, belgilangan me’yordagi sulfat kislotani fosforitga oz-ozdan qo‘shish bilan olib borildi[3,4,5].Laboratoriya o‘tkazish uchun Markaziy Qizilqum fosforitining termik konsentrati (tarkibi: P_2O_5 – 25,68 %; CaO – 53,28 %; CO_2 – 2,68 %; MgO – 1,22 %; F – 2,76, R_2O_3 – 3,58 %; SO_3 – 5,01%) va 93% li sulfat kislota olindi. Sulfat kislotaning stexiometrik me’yori fosforit tarkibidagi kalsiyning parchalanishi uchun zarur bo‘lgan miqdorga ko‘ra 100% belgilandi va tegishli konsentratsiyadagi suvli eritmaga keltirib olindi. Reaksiya natijasi asosida olingan ekstraksion fosfat kislotaning konsentratsiyasini ko‘tarish orqali konsentrlangan kislota olishda harorat toki 523K ga qadar olindi.

Natijalari.

Olingan dastlabki bosqichdagi EFK ni 100 gramm og‘irlikda 3 ta stakanda olindi va ularning har biri alohida usullarda bug‘latildi:

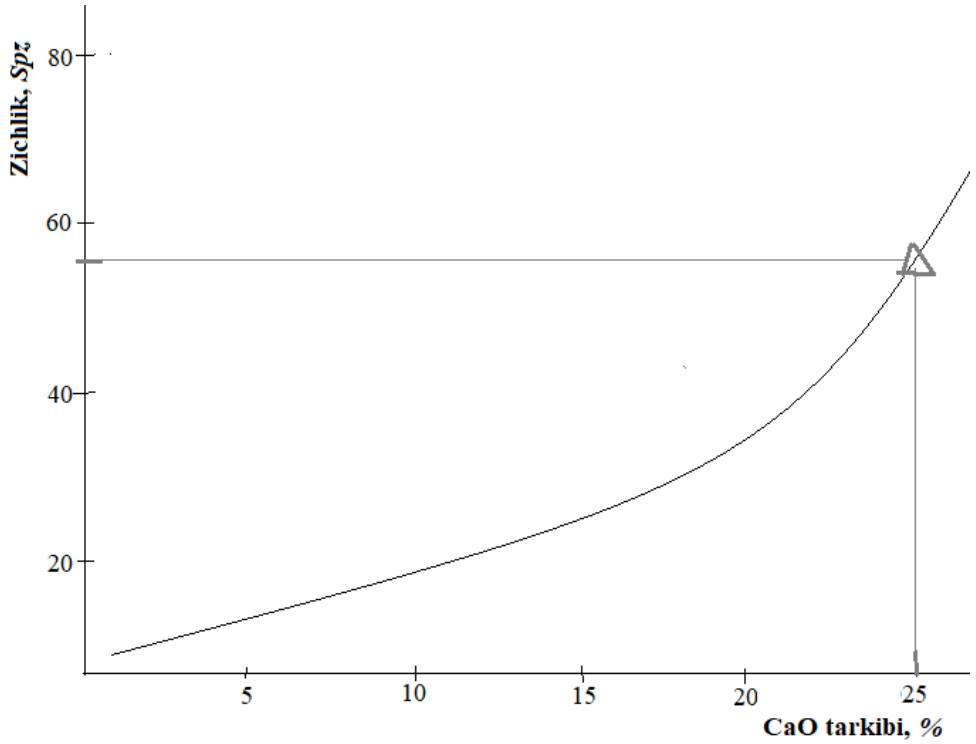
1. Atmosfera bosimi P_0=96,7 kPa (723 mm.sim.ust.) sharoitida moyli qizdirgich hammomida bug‘latilganida, reaktordagi massaning harorati 115 ^oS dan 198 ^oS ga borganida konsentratsiya 55 % P_2O_5 ga yetdi. Biroq, umumiy massa quyuq holda, ya’ni oqish holatini yo‘qotgan holatga keldi.
2. Bug‘latishni o‘sha usulda bosimni 20 kPa ga qadar tushirib bug‘latilib ko‘rilganida harorat mos ravishda 80^oS dan 110 ^oS gacha o‘zgarishi kuzatildi. Bunda ham reaktordagi massa quyuq holatda bo‘ldi.
3. Atmosfera bosimi P_0=96,7 kPa (723 mm.sim.ust.) sharoitida qizdirilgan havoli bug‘latish usuli qo‘llanilganida harorat birinchi holatdagi kabi bo‘ldi. Olingan konsentrlangan EFK tindirilib, tiniq qismi tahlil qilib ko‘rilganida, uning tarkibidagi ftorning miqdori qizdirilgan havo bilan konsentrlashdagi olingan kislotada kamligi ma’lum bo‘ldi. Bundan ko‘rinadiki, chorva hayvonlari uchun fosforli ozuqa yem ishlab chiqarish uchun shu usulda olingan kislotlarni ishlatish mumkinligi aniqlandi.

Avvalo hozirgi kunda fosforitlardan olingan EFKlardan mineral fosforli o‘g‘it olish sanoatida quyidagi turlarda bo‘lishi mumkin:

1. Superfosfat, ammofos kabi oddiy fosforli o‘g‘itlar.
2. Kalsiyli, kaliyli superfosfat va ammoniy fosfatlar.
3. Murakkab, kompleks turdagi fosforli o‘g‘itlar. Bularning tarkibiga ko‘ra tashkil etuvchi moddalarning o‘simlik tomomnidan o‘zlashuvchan foyrmasiga qarab o‘g‘it sifatini belgilash imkoniyati yaratiladi. Shuning uchun o‘simlik rivojlanishini yaxshilash maqsadida kalsiyli fosforli o‘g‘itlar ishlab chiqarishga e’tibor ko‘proq qaratilgan.

Умуман олганда фосфоритдан олинган дастлабки экстракцион фосфат кислота (ЭФК) нинг полифосфат кислотага айланиши кузатилди. Polifosfatlar deganda tarkibidagi orto- formadagi fosforning poliformaga o‘tgan holatdagi fosfatlardir. Buning amalga oshirilishi bilan bog‘liq bo‘lgan tushunchalar zamirida “Termofosfat kislota” va “Ekstraksion fosfat kislotalar” ni tarkibidagi keraksiz moddalar (masalan, suv)ni chiqarib tashlash hisobiga konsentratsiyasini oshirish turadi. Buning yuqori haroratda amalga oshirilishi ortofosfatlarning polifosfatga aylanishida zarur omil hisoblanadi[6.7,8,9,10].

Olingan polifosfat kislotalar tarkibiga kalsiyli minerallar qo‘shilishi bilan ularning neytrallanishi kuzatiladi. Buning uchun $CaCO_3, Ca(OH)_2$ va CaO minerallar ishlatilishi mumkin.



1-rasm: Konsentrlangan fosfat kislotani SaO miqdorining oshirib borilishiga qarab qovushqoqlikning ortib borishi

Olingan o‘g‘it tarkibidagi kalsiy miqdorining ortib borishi o‘g‘itning sifatli bo‘lishini bildiradi. Aynan kalsiy tarkibli minerallarning ko‘rsatib o‘tilgan turlari O‘zbekiston respublikasi hududida ko‘p uchraydi. Bu bilan aynan mahalliy

xomashyolar hisobiga olinadigan mineral o‘g‘itlar tannarxining arzon bo‘lishiga erishish mumkinligini ko‘rsatib o‘tish mumkin.

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O'ZBEKISTONDA KICHIK VA O‘RTA BIZNESNI RIVOJLANTIRISH UCHUN YARATILAYOTGAN SHART-SHAROITLAR

Annotatsiya: *Ushbu maqolada O‘zbekistonda olib borilayotgan iqtisodiy islohotlar orqali iqtisodiyotning barqaror o‘sishi, kichik va o’rta biznesning o’rni, mamlakatimizda uni rivojlantirish uchun yaratilayotgan yangi imkoniyatlar va davlat tomonidan qo‘lllab quvvatlanishi bayon etilgan.*

Kalit so‘zlar: *Tadbirkorlik, kichik biznes ,o’rta biznes, tadbirkorlik, iqtisodiy islohotlar, oilaviy tadbirkorlik, makroiqtisodiy ko‘rsatkichlar,aholi bandligi.*

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CONDITIONS CREATED FOR THE DEVELOPMENT OF SMALL AND MEDIUM-SIZED BUSINESES IN UZBEKISTAN

Abstract: *This article describes the sustainable of the economy through economic reforms in Uzbekistan, the role of small and medium-sized business, conditions created for its development in our country, and state support.*

Key words: *Entrepreneurship, small business, medium business, economic reforms, family business, macroeconomic indicators, population employment.*

O‘zbekistonda kichik va o‘rta biznesni qo‘llab-quvvatlash va rivojlantirish uchun keng qamrovli ekotizim yaratildi. O‘zbekiston Respublikasi Prezidentining ”Kichik va o‘rta biznesning iqtisodiyotdagi o‘rnini oshirish chora-tadbirlari to‘g‘risida” 19.03.2025 yildagi PF-50-son Farmonida kichik va o‘rta biznesning jadal rivojlanishi uchun qulay shart-sharoitlar yaratish, hududlarda biznes muhitini yanada yaxshilash, iqtisodiy o‘sishga turtki beruvchi yangi biznes tashabbuslarni amalga oshirishga ko‘maklashish, raqobatbardosh mahsulotlar bilan yangi tashqi bozor segmentlariga chiqishni qo‘llab-quvvatlash masalalariga e’tibor qaratilgan. Prezident Sh. Mirziyoyevning so‘zlariga ko‘ra, bankning faoliyati ham, ishlash usullari ham, jumladan, moliyalashtirish mexanizmlari ham jiddiy o‘zgarishlarga uchraydi. Xususan, har bir hududdagi bank huzurida kichik biznes markazi tashkil etiladi. Mazkur markazlar tadbirkorlar tashabbusi bilan amalga oshirilayotgan biznes loyihalarni ishlab chiqishga xizmat qiladi.[7] Ular yangi loyihalarni amalga

[7] O'zbekiston Respublikasi. Prezidenti Sh.M.Mirziyoyevning 2023 yil 18 avgustda tadbirkorlar bilan o’tkazgan Ochiq Muloqoti.

oshirishga intilayotgan tadbirkorlarni mustaqil ravishda o‘qitish, zarur mutaxassislarni jalb etish, buxgalteriya hisobi, soliq, audit, marketing, yuridik va boshqa maslahat xizmatlarini taklif etadi. Markazlar yangi korxonalarga zamonaviy texnologiyalarni o‘zlashtirish, xodimlarning malakasini oshirish, mahsulotlarini samarali yo‘lga qo‘yishda yordam beradi. Prezident o‘z nutqida yuqorida aytilgan jamg‘armalarga mustaqil ravishda investitsiyalarni jalb qilish huquqi berilganini ta’kidladi. Ushbu jamg‘armalar kelgusi yilda o‘rta biznes uchun qo‘shimcha 1 milliard dollar sarmoya jalb etishni maqsad qilgan.Eksportni kengaytirishning muhim imkoniyatlaridan biri O‘zbekistonga nufuzli xorijiy brendlarni jalb qilishdir.

Mamlakatimizda “Kichik biznesni rivojlantirishni moliyaviy va institutsional qo’llab-quvvatlash chora-tadbirlari to’g’risida”gi Prezident qarori (PQ-306 son,14.09.2023 y) qabul qilindi va shu qarorga ko‘ra, 2023 yil 1 oktyabrdan “Kichik biznesni uzluksiz qo‘llab-quvvatlash” kompleks dasturi amalga oshiriladi.[8]

Dasturni 2023-2026 yillarda amalga oshirish uchun davlat mablag‘lari hisobidan 6 trillion so‘m va xalqaro moliya institutlarining 1,2 milliard AQSH dollari miqdoridagi mablag‘lari yo‘naltirilishi ko‘zda tutilmoqda. Xususan, “Biznesni rivojlantirish banki” ATB ta’sischiligida “Kichik biznesni rivojlantirish jamg‘armasi” va Jamg‘arma tarkibida hududlarda 14 ta “Kichik biznesga ko‘maklashish hududiy markazlari” tashkil etilgani qayd etildi. Ushbu markazlar orqali kichik biznes loyihalarini tanlash, tashabbuskorlarni o‘qitish, moliyalashtirish, axborot bilan ta’minlash, biznes rejalar va texnik iqtisodiy asoslarni ishlab chiqish, bozor topish bilan bog‘liq kompleks xizmatlar ko‘rsatiladi. Hozirgi murakkab sharoitda barcha davlatlar o‘z yurtidagi ishlab chiqaruvchilarni himoya qilishni ustuvor yo‘nalish sifatida ko‘rayapti. Biz ham raqobatbardosh mahsulotlar ishlab chiqarishni rag‘batlantirish bo‘yicha tadbirkorlarimizni yanada keng qo‘llab-quvvatlanmoqda.

Bugun ham tadbirkorlik uchun qo‘shimcha sharoitlar yaratish bo‘yicha muhim yangi tashabbuslar va yo‘nalishlar belgilab berildi:

Birinchi yo‘nalish – kichik va o‘rta biznes uchun moliyaviy resurslarni ko‘paytirish. O‘tgan yili kichik va o‘rta biznesni moliyaviy qo‘llab-quvvatlash uchun yangi tizim joriy qildik. Bu borada Biznesni rivojlantirish banki va Tadbirkorlikni rivojlantirish kompaniyasi tashkil etilib, yil boshidan 35 mingdan ortiq tadbirkorlarga o‘rtacha 100 million so‘mdan jami 3,5 trillion so‘m mikrokreditlar ajratildi[9]. Bundan tashqari, “Biznesga birinchi qadam” dasturi bo‘yicha tadbirkorlikni endi boshlayotgan 115 ming aholiga 1 trillion so‘mlik mikroqarzlar berildi.

Ikkinchi yo‘nalish – biznesni infratuzilma, yer va energiya bilan ta’minlash.

Ochiq muloqot doirasida kelib tushgan 11 mingta murojaatdan 2 mingtasi yer va infratuzilma bilan bog‘liq. Joylarda o‘tkazilgan so‘rovda ham 55 foiz tadbirkor elektr energiyasi, gaz ta’minotida, tarmoqqa ulanishda muammo borligini aytgan.

[8] O’zbekiston Respublikasi Prezidenti Sh.M.Mirziyoyevning “Kichik biznesni rivojlantirishni moliyaviy va institutsional qo’llab-quvvatlash chora-tadbirlari to’g’risida”gi qarori.PQ-306 son,14.09.2023.

[9] O‘zbekiston Respublikasi Prezidenti Shavkat Mirziyoyevning mamlakatimiz tadbirkorlari bilan ochiq muloqot shaklida o‘tkazilgan uchrashuvdagi nutqi.2024 yil 20 avgust.

Bilasizlarmi, mamlakatimizdagi 44 million 800 ming gektar yerning bozor qiymati hisoblansa, aholi va tadbirkorlarda qanchadan-qancha “iqtisodiy aktiv” paydo bo‘ladi.

Uchinchi yo‘nalish – ichki bozorda teng raqobat muhitini yaratish, tashqi bozorlarga chiqish imkoniyatlarini kengaytirish.

Joriy yilning yetti oyida eksportimiz 13 foizga o‘sib, 10 milliard dollardan oshdi, avval eksport qilmagan 1 ming 610 ta korxona tashqi bozorlarga chiqdi. Bunday korxonalar soni 6 mingdan oshdi.

To‘rtinchi yo‘nalish – xizmatlar sohasiga yangi turtki berish.

O‘zbekistonda band aholining 52 foizi xizmatlar sohasida ishlayapti. Ishlab turgan korxonalarning 68 foizi (264 mingtasi) ham xizmatlar sohasiga to‘g‘ri keladi. Lekin sohada band bo‘lganlarning atigi 4 foizi yuqori qo‘shilgan qiymat beradigan yo‘nalishda faoliyat yuritayapti.[10] Bu yo‘nalishda yangi loyihalarni amalga oshirish uchun barcha sharoitlar yaratiladi. IT parkda sun’iy intellekt markazi ochiladi. Loyihalarni moliyalashtirish uchun 50 million dollar ajratiladi.

Beshinchi yo‘nalish – biznes uchun to‘siq va g‘ovlarni yanada qisqartirish.

Biz so‘nggi yillarda tadbirkorlik yo‘lidagi byurokratik to‘siqlarni bartaraf etish bo‘yicha katta islohotlarni amalga oshirdik. Lekin tadbirkorlarimiz haligacha ayrim muammolar saqlanib qolayotganini bildirgan.

Birinchidan, tadbirkorlik faoliyatini to‘xtatishga asos bo‘ladigan qonun buzilish holatlari darajasi belgilanmagan.

Ikkinchidan, tadbirkorlarni jinoiy javobgarlikka tortish yanada liberallashadi.

Soliqlarni to‘lashdan bo‘yin tovlash, degan jinoyat turi bor. Bunda tadbirkorning to‘lamagan solig‘i 100 million so‘mdan (bazaviy hisoblash miqdorining 300 baravari) oshsa, jinoyatchi bo‘lib qolmoqda. Lekin tadbirkorlarga imkon berilsa, bu summani bemalol to‘lay oladi, buning uchun ularni oylab tergov qilish shart emas.

Uchinchidan, kredit oldi-berdisida bank ham, tadbirkor ham tavakkal qiladi. Lekin amaliyotda bankning huquq va vakolatlari tadbirkorga nisbatan ancha ko‘proq. Masalan, kredit vaqtida qaytarilmasa, garovga qo‘yilgan mulkni bank shartnoma tuzilgan paytdagi qiymatida sotuvga chiqaradi. O‘tgan 6 oyda banklar 1,3 trillion so‘mga baholangan mingdan ziyod garovdagi mol-mulklarni auksionga chiqargan. Ushbu tashabbuslarni tez kunlarda qonun bilan mustahkamlab qo‘yamiz. O‘ylaymanki, bu takliflar sizlarga ma’qul.

To‘rtinchidan, “snoslar” bo‘yicha kompensatsiya to‘lashda haligacha muammolar bor. Hozirda ushbu xarajatlar viloyat budjeti hisobidan qoplanayapti. Lekin ayrim viloyatlar budjetida mablag‘ kam qolayotgani uchun tadbirkorning pulini qoplab berish 5-6 yilga cho‘zilib ketayapti.

Xulosa qilib aytganda, O‘zbekistonda kichik va o‘rta biznesni rivojlantirish uchun yaratilayotgan shart-sharoitlar iqtisodiyotning diversifikatsiyasini ta'minlash hamda ijtimoiy barqarorlikni oshirishga katta hissa qo'shmoqda.

[10] O‘zbekiston Respublikasi Prezidenti Shavkat Mirziyoyevning mamlakatimiz tadbirkorlari bilan ochiq muloqot shaklida o‘tkazilgan uchrashuvdagi nutqi.2024 yil 20 avgust.

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EXPLORING OPPORTUNITIES FOR TOURISM DEVELOPMENT IN UZBEKISTAN

Abstract: *The abstract delves into Uzbekistan's potential for tourism development, focusing on its cultural heritage, historical sites, and natural attractions. The study aims to identify opportunities for growth and provide insights for policymakers and stakeholders. By analyzing current trends and challenges, this research article offers valuable recommendations for leveraging Uzbekistan's tourism sector.*

Keywords: *Uzbekistan, tourism development, cultural heritage, historical sites, natural attractions, sustainable tourism, eco-tourism, infrastructure, marketing, visitor experiences, conservation, community engagement, responsible tourism, economic growth, cultural exchange.*

Introduction:

Uzbekistan, situated at the heart of Central Asia and steeped in a rich history dating back thousands of years, possesses a wealth of untapped potential in the realm of tourism. As a land that once served as a crucial hub along the ancient Silk Road, the country is adorned with a mosaic of cultural treasures, architectural wonders, and breathtaking landscapes waiting to be discovered by travelers from around the world.

Despite its historical significance and natural beauty, Uzbekistan's tourism industry has yet to fully flourish to its fullest capacity. While neighboring countries in the region have made significant strides in attracting visitors and boosting their economies through tourism, Uzbekistan stands at a pivotal moment in its journey towards becoming a prominent player in the global tourism arena.

This article seeks to delve deep into the possibilities and challenges that lie ahead for Uzbekistan's tourism sector. By examining the country's historical and cultural heritage, including its UNESCO World Heritage sites like Samarkand, Bukhara, and Khiva, we aim to highlight the unique allure that Uzbekistan holds for cultural enthusiasts and history aficionados alike.

Furthermore, the natural beauty of Uzbekistan, ranging from the Aral Sea to the Chimgan Mountains, presents a compelling case for the development of ecotourism initiatives that not only showcase the country's diverse landscapes but also prioritize environmental conservation and sustainability.

As we navigate through the complexities and intricacies of Uzbekistan's tourism landscape, it becomes apparent that challenges such as infrastructure limitations, marketing deficiencies, and the need for enhanced visitor experiences must be addressed to unlock the full potential of the country's tourism industry. By formulating strategic solutions and fostering collaboration between government

entities, private sector stakeholders, and local communities, Uzbekistan can pave the way for a thriving tourism ecosystem that benefits both visitors and the local population.

In conclusion, Uzbekistan stands on the threshold of a transformative journey towards harnessing its tourism potential for economic growth, cultural exchange, and sustainable development. By leveraging its historical legacy, cultural richness, and natural splendor, Uzbekistan has the opportunity to carve out a distinct niche for itself in the global tourism market. Through proactive planning, strategic investments, and collective efforts, Uzbekistan can position itself as a premier destination that captivates the hearts and minds of travelers, while also enriching the lives of its own citizens.

Uzbekistan's historical and cultural heritage stands as a testament to the country's rich tapestry of civilizations that have left an indelible mark on its landscape. From the ancient cities of Samarkand, Bukhara, and Khiva to the intricate architectural masterpieces found throughout the country, Uzbekistan offers a glimpse into a bygone era of grandeur and sophistication.

Samarkand, often referred to as the "Pearl of the East," served as a pivotal center of trade, culture, and scholarship along the Silk Road. Its majestic Registan Square, adorned with stunning madrasas and mosques, showcases the architectural brilliance of the Timurid dynasty and remains a testament to Uzbekistan's glorious past.

Bukhara, another UNESCO World Heritage site, is a living museum of Islamic architecture, with its labyrinthine streets, ancient citadel, and well-preserved monuments transporting visitors back in time to the days of Silk Road caravans and scholarly pursuits.

Khiva, a city steeped in history and tradition, offers a glimpse into the medieval era of Central Asia, with its imposing city walls, ornate palaces, and bustling bazaars evoking a sense of wonder and intrigue.

The cultural heritage of Uzbekistan is not confined to its architectural wonders alone but extends to its vibrant traditions, arts, crafts, music, and cuisine. The intricate patterns of Uzbek textiles, the melodious notes of traditional music, and the tantalizing flavors of plov and shashlik all contribute to the country's rich cultural tapestry that continues to captivate visitors from near and far.

Preserving and promoting Uzbekistan's historical and cultural heritage is not just a matter of pride but also a strategic imperative for the country's tourism industry. By showcasing the unique blend of influences that have shaped Uzbekistan's identity over the centuries, the country can attract cultural enthusiasts, history buffs, and curious travelers eager to uncover the secrets of this ancient land.

In harnessing its historical and cultural legacy, Uzbekistan has the opportunity to position itself as a top cultural tourism destination, offering visitors a truly immersive and enriching experience that celebrates the country's past while embracing its future.

Uzbekistan's natural attractions offer a breathtaking tapestry of landscapes that beckon travelers to explore and discover the country's pristine beauty. From the

vast expanse of the Aral Sea to the majestic peaks of the Chimgan Mountains, Uzbekistan's natural wonders provide a sanctuary for those seeking adventure, tranquility, and a deeper connection with the environment.

The Aral Sea, once one of the world's largest inland bodies of water, now serves as a stark reminder of environmental challenges and the importance of conservation efforts. Despite its diminished size due to decades of water diversion, the Aral Sea region still holds ecological significance and offers unique opportunities for eco-tourism initiatives focused on sustainability and restoration.

The Chimgan Mountains, part of the larger Tian Shan mountain range, beckon outdoor enthusiasts with their snow-capped peaks, lush valleys, and alpine meadows. Popular for hiking, skiing, and mountaineering, the Chimgan Mountains provide a playground for adventure seekers looking to immerse themselves in the natural beauty of Uzbekistan.

Aydarkul Lake, a shimmering oasis in the desert landscape of Uzbekistan, offers a tranquil escape for visitors seeking respite amidst nature's bounty. Surrounded by sandy beaches and teeming with birdlife, Aydarkul Lake presents opportunities for camping, birdwatching, and water-based activities that showcase the country's diverse ecosystems and biodiversity.

Uzbekistan's eco-tourism potential extends beyond these iconic destinations to include the Nuratau Mountains, the Kyzylkum Desert, and the Ugam-Chatkal National Park, each offering a unique blend of flora, fauna, and geological wonders waiting to be explored.

By harnessing the allure of its natural attractions, Uzbekistan can diversify its tourism offerings, attract nature lovers and outdoor enthusiasts, and promote sustainable practices that preserve the country's environmental heritage for future generations. Initiatives focused on eco-friendly tourism, community engagement, and conservation efforts can help Uzbekistan position itself as a leading destination for travelers seeking a harmonious blend of nature, culture, and adventure.

In embracing its natural treasures and promoting responsible tourism practices, Uzbekistan can not only unlock the economic potential of its natural attractions but also foster a deeper appreciation for the intrinsic value of its environment among visitors and locals alike.

In conclusion, Uzbekistan stands at a crossroads of opportunity and transformation in its quest to harness the full potential of its tourism sector. The country's rich historical and cultural heritage, coupled with its diverse natural attractions, sets the stage for a vibrant tourism industry that can drive economic growth, cultural exchange, and sustainable development.

By strategically leveraging its UNESCO World Heritage sites, such as Samarkand, Bukhara, and Khiva, Uzbekistan can position itself as a premier cultural tourism destination, captivating visitors with its ancient wonders and timeless charm. Additionally, by promoting its natural landscapes, including the Aral Sea, Chimgan Mountains, and Aydarkul Lake, Uzbekistan can tap into the burgeoning market of eco-tourism and outdoor adventure enthusiasts seeking immersive experiences in pristine environments.

However, challenges such as infrastructure limitations, marketing gaps, and the need for enhanced visitor experiences must be addressed through collaborative efforts involving government agencies, private sector stakeholders, and local communities. By investing in infrastructure development, improving hospitality services, and implementing effective marketing strategies, Uzbekistan can enhance its competitiveness in the global tourism market and attract a diverse range of travelers.

Moreover, fostering sustainable tourism practices that prioritize environmental conservation, community engagement, and cultural preservation is essential for ensuring the long-term viability of Uzbekistan's tourism industry. By embracing responsible tourism principles and nurturing a culture of stewardship towards the country's natural and cultural assets, Uzbekistan can create a lasting legacy that benefits both present and future generations.

In essence, Uzbekistan's journey towards tourism development is not just about attracting visitors and generating revenue; it is about showcasing the country's unique identity, fostering cross-cultural exchange, and creating shared prosperity for all stakeholders involved. Through strategic planning, investment in infrastructure and human capital, and a steadfast commitment to sustainability, Uzbekistan has the potential to emerge as a shining beacon on the global tourism map, captivating hearts and minds with its beauty, history, and hospitality.

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THE MAIN DRIVER OF SOCIO-ECONOMIC DEVELOPMENT: HUMAN RESOURCES

Annotation: *This comprehensive research paper analyzes how human capital serves as the primary catalyst for socio-economic progress. Through comparative case studies and statistical evidence, we demonstrate the direct correlation between investments in human development and national economic performance, with particular attention to education systems, healthcare quality, and innovation ecosystems.*

Key words: *Human capital development, education quality, healthcare investment, innovation index, labor productivity, economic transformation.*

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IJTIMOIY-IQTISODIY TARAQQIYOTNI ASOSIY HARAKATLANTIRUVCHI KUCH: INSON RESURSLARI

Annotatsiya: *Ushbu keng qamrovli ilmiy maqola inson kapitalining ijtimoiy-iqtisodiy taraqqiyotning asosiy katalizatori sifatida xizmat qilishini tahlil qiladi. Taqqoslash usuli bilan o‘tkazilgan holat tadqiqlari va statistik dalillar orqali biz inson taraqqiyotiga sarmoyalash va milliy iqtisodiy natijalar o‘rtasidagi bevosita bog‘liqlikni ko‘rsatamiz, ayniqsa ta’lim tizimlari, sog‘liqni saqlash sifati va innovatsion ekotizimlarga alohida e’tibor qaratamiz.*

Kalit so'zlar: *Inson kapitalini rivojlantirish, ta’lim sifati, sog‘liqni saqlashga sarmoya kiritish, innovatsiya indeksi, mehnat unumdorligi, iqtisodiy o‘zgarishlar*.

The paradigm of economic development has fundamentally shifted in the 21st century. While natural resources were historically considered the primary wealth of nations, contemporary economic theory and practice demonstrate that human capital has become the most critical factor for sustainable development. This paper presents a multidimensional analysis of how investments in people - through education, healthcare, and innovation systems - create lasting economic value and social progress.

Recent studies by the World Bank (2023) indicate that human capital accounts for approximately 65% of the wealth differences between nations. This research examines the mechanisms through which human resources translate into economic

growth, supported by comparative data from both developed and developing economies.

Education as the Cornerstone of Development

Education stands as the fundamental pillar of socio-economic development, serving as both a driver of individual opportunity and national competitiveness. In the knowledge-based global economy, the quality of a nation's education system directly correlates with its economic performance, innovation capacity, and social cohesion. This section presents a detailed examination of how strategic investments in education yield substantial economic returns, supported by comparative international data and case studies.

Global experience unequivocally demonstrates that education systems quality directly correlates with economic performance. The following comparative analysis reveals this relationship:

Country	Education Investment (% of GDP)	PISA Score (Math)	GDP per capita (PPP, $)
Finland	6.8%	507	54,000
South Korea	5.3%	526	47,000
Singapore	6.1%	564	72,000
Uzbekistan	4.9%	408	8,100

Table 1: Education Quality and Economic Outcomes (2024 Data)

The data illustrates a clear pattern: nations allocating more than 6% of GDP to education consistently achieve both superior academic performance and higher economic output. Finland's education system, emphasizing equal opportunities and teacher quality, has produced a highly skilled workforce that drives its knowledge-based economy.

South Korea's remarkable transformation from a war-torn nation to a technological powerhouse was achieved through sustained investment in education, now accounting for 8% of household spending. Uzbekistan's recent reforms, including the establishment of Presidential schools and increased teacher salaries, show promising early results with literacy rates reaching 99.9%.

Vocational Training and Digital Skills Revolution

The German dual education system combines classroom instruction with on-the-job training, resulting in youth unemployment rates of just 5.3% compared to the EU average of 14%. Similarly, Uzbekistan's IT Park initiative has trained over 50,000 specialists in programming and digital technologies since 2019, contributing to the sector's 300% growth.

Healthcare as Productivity Multiplier

A healthy population is essential for economic growth. Access to healthcare ensures longer, more productive working lives. For example, Scandinavian countries combine universal healthcare with strong labor policies, resulting in high GDP per capita. Improving public health directly boosts a nation's economic potential.

The correlation between population health and economic productivity is well-established in economic literature. Consider the following international comparison:

Country	Health Expenditure (% GDP)	Healthy Life Expectancy	Labor Productivity ($/hour)
Japan	10.9%	74.1 years	45.60
Germany	11.7%	71.2 years	60.80
USA	16.8%	66.1 years	72.00
Uzbekistan	6.4%	63.8 years	8.50

Table 2: Healthcare Investment and Workforce Productivity

The data reveals that while absolute spending matters, the efficiency of healthcare systems is equally crucial. Japan achieves remarkable health outcomes with relatively modest spending through its emphasis on preventive care and universal coverage. Uzbekistan's healthcare reforms since 2017 have increased life expectancy by 3.2 years, demonstrating the economic returns of improved health access.

Innovation and Entrepreneurship

In today's rapidly evolving global economy, innovation and entrepreneurship have emerged as critical drivers of competitive advantage and sustainable growth. This section analyzes how human capital transforms into economic value through technological advancement and entrepreneurial activity, supported by comprehensive global data and case studies.

Global Innovation Landscape: Key Indicators

The Global Innovation Index (2023) reveals striking patterns in innovation performance:

Country	Innovation Index Score	R&D Spending (% of GDP)	Researchers per Million	VC Investment (% of GDP)
Switzerland	67.3	3.4%	5,421	0.98%
USA	63.1	3.1%	4,325	1.12%
South Korea	61.5	4.8%	7,980	0.45%
China	55.3	2.4%	3,075	0.62%
Uzbekistan	28.7	0.5%	487	0.08%

Table 1: Comparative Innovation Metrics Across Nations

Key observations:

- **R&D investment threshold**: Countries spending >2.5% of GDP on R&D consistently rank as innovation leaders
- **Human capital intensity**: South Korea's exceptional researcher density drives its technological edge
- **Emerging potential**: Uzbekistan's IT Park initiative shows promising early results despite lower baseline

Conclusion

Human capital stands as the most powerful driver of socio-economic development in the modern world. This research demonstrates that investments in education, healthcare, and innovation directly translate into economic growth, productivity gains, and improved quality of life.

The evidence reveals that:

- Nations prioritizing **education** (6-7% of GDP investment) achieve higher GDP growth and competitiveness
- Healthy populations show **30-40% greater productivity**, creating a virtuous cycle of development
- **Innovation ecosystems** built on skilled human capital generate exponential economic returns

For Uzbekistan and similar developing economies, the path forward requires:

1. **Doubling down on education reform** – particularly in STEM and vocational training
2. **Modernizing healthcare systems** with preventive care and digital health solutions
3. **Building innovation infrastructure** – tech parks, startup incubators, and research centers

The examples of South Korea, Singapore and others prove that **strategic human capital development can transform economies within a single generation**. While natural resources deplete, human potential only grows when properly nurtured.

Ultimately, nations that treat their people as the **ultimate resource** – investing continuously in their knowledge, skills and wellbeing – will dominate the 21st century economy. Uzbekistan's ongoing reforms position it well to capitalize on this reality, though sustained effort and investment remain essential for long-term success.

The choice is clear: **human capital isn't just part of development – it's the very foundation**. Countries that recognize this truth today will reap the economic rewards for decades to come.

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15-16 YOSHLI ERKIN KURASHCHILARNING "YELKALARDAN OSHIRIB TASHLASH" TEXNIK USULINI BAJARISHDAGI KINEMATIKSINING INDIVIDUAL KO'RSATKICHLARI

Annotatsiya: *Ushbu maqolada erkin kurashchi talabalar o'quvchilari o'rtasida "Yelkalardan oshirib tashlash" texnikasining har tomonlama kinematik tahlili keltirilgan. Metodologiya texnika davomida ishtirokchilarning oyoq-qo'llarining burchak tezligi, traektoriyalari va kuch hosil bo'lishini ushlashga qaratilgan. Natijalar yangi boshlanuvchilar va tajribali amaliyotchilar o'rtasidagi kinematik mashqlarda sezilarli o'zgarishlarni aniqladilar, ikkinchisi esa samaraliroq energiya uzatish va yuqori zarba tezligini namoyish etdi. Muhokama "Yelkalardan oshirib tashlash" texnikasining samaradorligini oshirishda to'g'ri moslashtirish va vaqtni belgilash muhimligini, shuningdek, noto'g'ri bajarilganda shikastlanish ehtimolini ta'kidlaydi. Tadqiqot natijalari murabbiylar va sportchilarga o'z mahoratini oshirish va kurash bo'yicha optimal natijalarga erishishda yordam beradigan tushunchalarni taqdim etadi.*

Kalit so'zlar: *Kinematika, 3D MA tahlil, sagittal o'q, diapazon, burchak*

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INDIVIDUAL KINEMATIC INDICATORS OF 15-16 YEAR-OLD FREESTYLE WRESTLERS WHEN PERFORMING THE TECHNICAL MOVEMENT "THROW OVER THE SHOULDER"

Summary: *This article presents a comprehensive kinematic analysis of the "over-the-shoulder" technique among freestyle wrestling student athletes. The methodology aimed to capture the angular velocities, trajectories, and force generation of participants' limbs during the technique. The results revealed significant differences in kinematics between novice and experienced practitioners, with the latter demonstrating more efficient energy transfer and higher impact velocity. The discussion highlights the importance of proper alignment and timing in enhancing the effectiveness of the "over-the-shoulder" technique, as well as the potential for injury when performed incorrectly. The results of the study provide insights that can help coaches and athletes improve their skills and achieve optimal wrestling results.*

Keywords: *Knimatics, 3D Ma analysis, sagittal axis, range, angle*

Dolzarbligi. Respublikamizda sportchilarning harakat tayyorgarligini rivojlantirish, yoshlar orasidan professional sportga iqtidorli sportchilarni jalb etish borasida muhim ishlar amalga oshirilmoqda. O‘zbekiston sportchilarini kompleks tayyorlash to‘g‘risidagi Qarori va O‘zbekiston Respublikasi Prezidentining 2022-yil 29-iyuldagi PQ-336-sonli “Sport kurashlarining olimpiya turlarini yanada rivojlantirish chora-tadbirlari to‘g‘risida”gi qarori shular jumlasidandir [1].

Shu bois, vatanimizda yakkakurash sport turlarini ommaviylashtirish va bog‘chadan kurash turlari bilan shug‘ullantirish bo‘yicha keng qamrovli ishlar olib borilmoqda. Erkin kurash texnikasi sportchi mahoratining asosi hisoblanadi va ko‘p jihatdan uning imkoniyatlarini belgilab beradi. Bugungi kunda, amalga oshirilgan ilmiy izlanishlarda kurashchilar tomonidan musobaqa mashqlarini texnik mahorat bilan amalga oshirishni takomillashtirishda majmuaviy yondashuv uslublaridan foydalanish tavsiya etilgan.

Erkin kurashchilarning harakat ko‘rsatgichlarini shakllantirishda asosiy omillardan biri sifatida kinematic tahlillar olib borish, James L.P. (2016) texnik usullarning kinematik tahlili haqida batafsil tasvirlangan, shuningdek himoya qilish usullarini hal qiluvchi qarshi hujumlar bilan birlashtirish bo‘yicha ko‘rsatmalar bergan [2,3,4,5].

Mashg‘ulot jarayonida “Yelkalardan oshirib tashlash” texnikasini takomillashtirish hamda hujum texnikasi kinematikasining asosiy qonuniyatlarini bilish lozim. Buning natijasida hujum harakatining kinematik ko‘rsatkichlari to‘g‘risidagi ma’lumotlarga ega bo‘lish murabbiyda “Yelkalardan oshirib tashlash” texnikasini takomillashtirishda vosita va metodlarni to‘g‘ri tanlashga yordam beradi [2,5,6].

Kurashchilarning “Yelkalardan oshirib tashlash” texnikasini kinematik tahlil qilish muhim ahamiyatga ega sanalib, bunday tahrirlar bizga hujum texnikasi samaradorligi haqida muhim ma’lumotlarni taqdim etishi mumkin va shu boisdan biz tanlagan “Yelkalardan oshirib tashlash” texnikasining kinematik xususiyatlari mavzusi bugungi kunda dolzarb mavzulardan biri hisoblanadi.

Tadqiqotning maqsadi sport ustaligiga nomzod bo‘lgan talabalarning “Yelkalardan oshirib tashlash” zarbasi texnikasining kinematik xususiyatlarini aniqlash.

Tadqiqotning vazifasi:

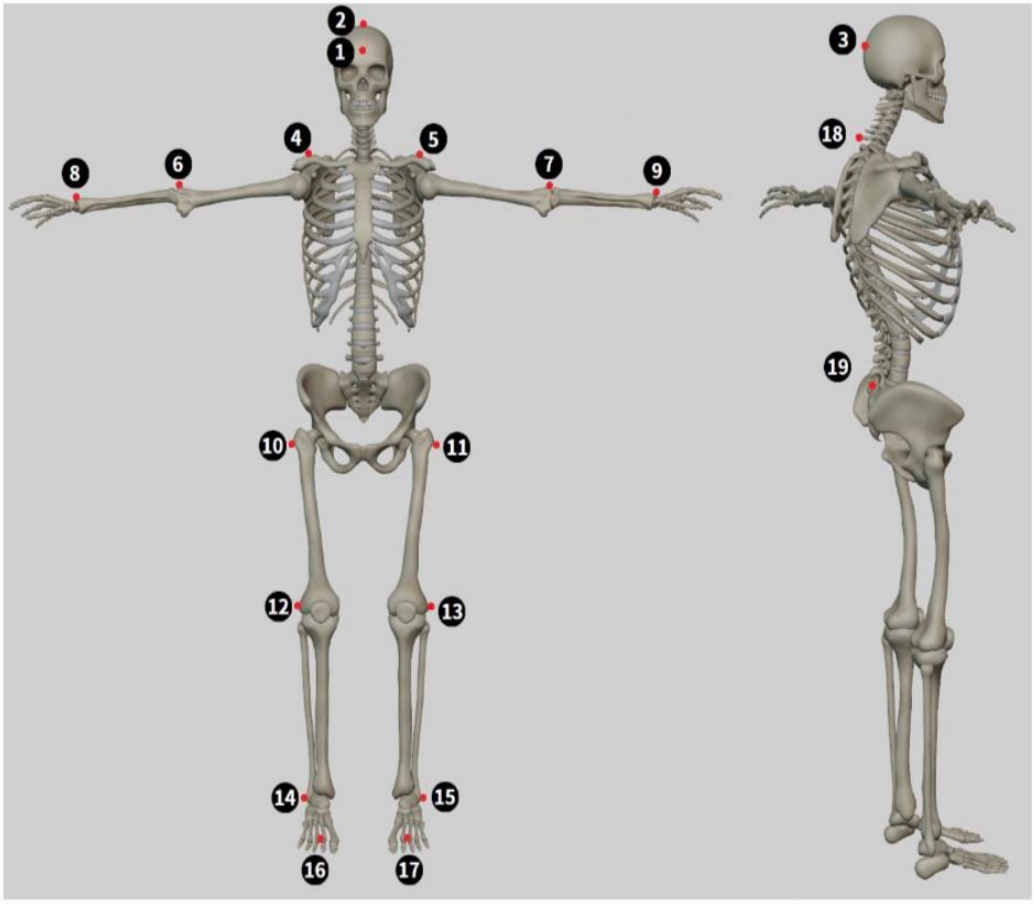
- sport ustaligiga nomzod kurashchilarning “Yelkalardan oshirib tashlash” texnikasining harakatlarining kinematik ko‘rsatkichlarini aniqlash.

- sport ustaligiga nomzod bo‘lgan kurashchilarning “Yelkalardan oshirib tashlash” texnikasining harakatlarining kinematik xususiyatlarini solishtirish.

Tadqiqot usullari va uning tashkil etish. Tadqiqot ishi O‘zbekiston davlat jismoniy tarbiya va sport univeritetida joylashgan “SPORT 360° 3D MA biomexanik labaratoriya”da olib borildi.

Tadqiqot ishida erkin kurash sport turi bilan shug‘ullanib kelayotgan sport ustaligiga nomzod bo‘lgan erkin kurashchilar ishtirok etdi. Tadqiqot davomida erkin kurashchilarga 15 daqiqa chigal yozdi mashqlardan so‘ng qanday tarzda “Yelkalardan oshirib tashlash” texnikasi va 3D tahlil xususiyatlari to‘g‘risida

tushunchalar berildi. Sinaluvchilarga imkon qadar “Yelkalardan oshirib tashlash” texnikasining aniqligi va to‘g‘ri bajarish to‘g‘risida ko‘rsatma berildi.

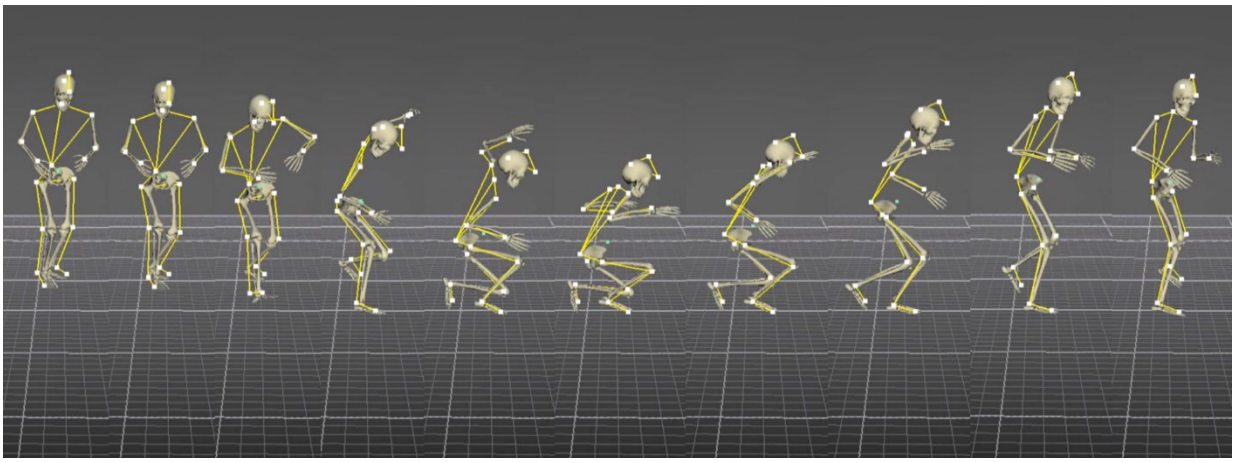


1-rasm. Butun tana bo‘ylab sensor markerlarning o‘rnatilish nuqtalari.

Note: Detailed marker placement description. 1. Head (front) Centered on the forehead (front of the cap, helmet or head band). 2. Head (top) Centered on top of the head (top of the cap, helmet or head band). 3. Head (back) Centered on the back of the head (back of the cap, helmet or head band). 4. Right shoulder Acromion of the right scapula. 5. Left shoulder Acromion of the left scapula. 6. Right elbow Lateral epicondyle of the right humerus. 7. Left elbow Lateral epicondyle of the left humerus. 8. Right wrist on the right ulnar styloid process. 9. Left wrist on the left ulnar styloid process. 10. Right hip Greater trochanter of the right femur. 11. Left hip Greater trochanter of the left femur. 12. Right knee Lateral epicondyle of the right femur. 13. Left knee Lateral epicondyle of the left femur. 14. Right ankle Lateral malleolus of the right fibula. 15. Left ankle Lateral malleolus of the left fibula. 16. Right toes on the distal end of 2nd-3rd metatarsal bone of right foot. 17. Left toes on the distal end of 2nd-3rd metatarsal bone of left foot. 18. C7 C7 vertebra (most prominent protrusion when bending down the head). 19. S2 S2 vertebra (between left and right PSIS).

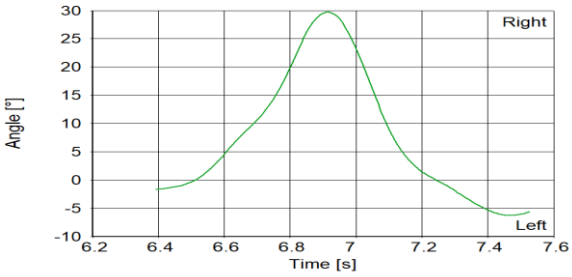
O‘tkazilgan tadqiqot natijalari tahlili. tadqiqot ishimizda sport ustaligiga nomzod hamda sport ustasi bo‘lgan erkin kurashchilarning Yelkalardan oshirib tashlash texnikasini bajarish davomida umurtqa pog‘onasining sagittal o‘q bo‘ylab oldinga va orqaga egilishi bilan bog‘liq 3D biomexanik tahlil natijalari aks ettirilgan

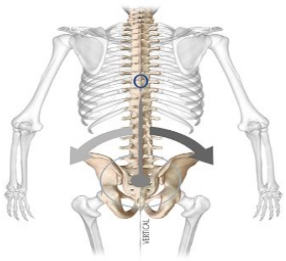
(2-rasm). A- sport ustasining harakatlar kinematikasi. B - sport ustaligiga nomzod erkin kurashchilarning harakatlari kinematikasi.



1-rasm. ***Erkin kurashchilarning oyoqlar oldidan chalish texnik usulining kinematik bajarilish tartibi***

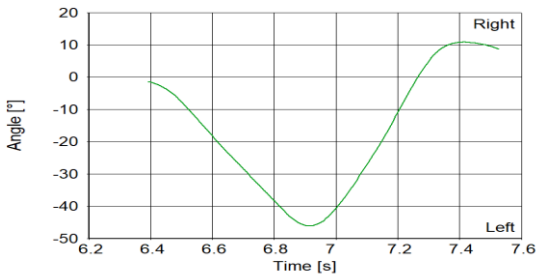
YONGA EGILISH
O‘ngga [+]/Chapga[-]
Min 0º
Mak 29 º
Diapazon 29 º





Erkin kurashchilarning yelkalardan oshirib tashlash texnik harakatini bajarish davomida umurtqa pog‘onasining sagital o‘q bo‘ylab oldinga va orqaga egilishi bilan bog‘liq 3D kinematik tahlil natijalari shuni ko‘rsatdiki, harakatning boshlang‘ich nuqtasida umurtqa pog‘onasi sagital o‘q bo‘ylab 0° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich sagital o‘q bo‘ylab oldinga 29° dan 29° burchak osti oralig‘ida egilgan.

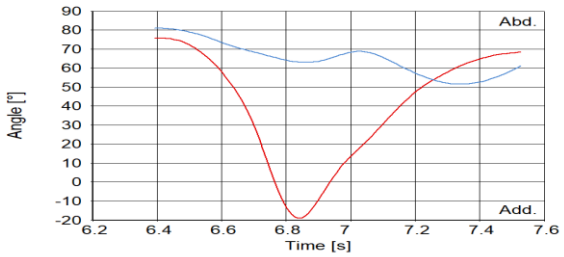
Yonga egilish
O‘ngga [+]/Chapga[-]
Min -46 º
Mak 10 º
Diapazon 56 º



Erkin kurashchilarning

yelkalardan oshirib tashlash texnik harakatini bajarish davomida bosh suyagining sagital o‘q bo‘ylab oldinga va orqaga egilishi bilan bog‘liq 3D kinematik tahlil natijalari shuni ko‘rsatdiki, harakatning boshlang‘ich nuqtasida umurtqa pog‘onasi sagital o‘q bo‘ylab -46° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich sagital o‘q bo‘ylab oldinga 10° dan 56° burchak osti oralig‘ida egilgan.

YELKALARNI YON TOMONGA SILJISHI



Tashqariga[+]/Ichkariga[-]

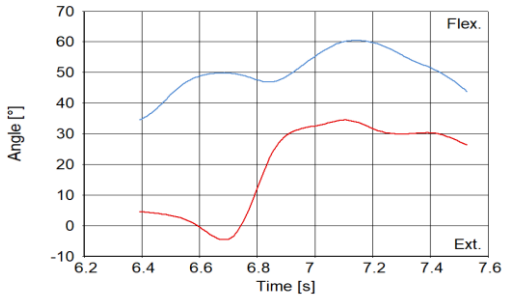
	CHAP	O‘NG
Min	-19º	51º
Mak	69º …	61º
Diapazon	89º	10º

Erkin kurashchilarning yelkalardan oshirib tashlash texnik harakatini bajarish davomida o‘ng va chap qo‘llar yelka suyaklari sagital o‘q bo‘ylab oldinga va orqaga burulishi bilan bog‘liq 3D kinematik tahlil natijalari shuni ko‘rsatdiki, harakatning boshlang‘ich nuqtasida o‘ng qo‘l yelka suyaklari sagital o‘q bo‘ylab old tomonga -19° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich 69° dan 89° burchak osti oralig‘ida burilgan, chap qo‘l yelka suyaklari esa sagital o‘q bo‘ylab old tomonga 51° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich 61° dan 10° burchak osti oralig‘ida ko‘rinishiga kelgan.

SON BUKULISH

Bukish[+]/Yozish[-]

	CHAP	O‘NG
Min	-5º	46º
Mak	34º	60º
Diapazon	39º	14º

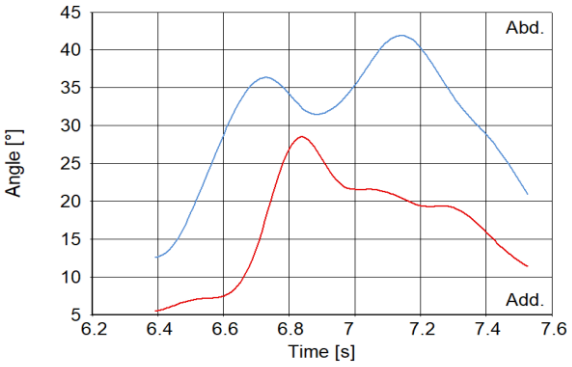


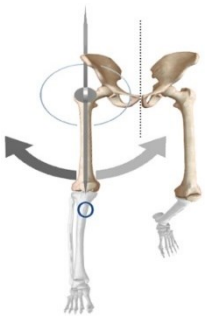
Erkin kurashchilarning yelkalardan oshirib tashlash texnik harakatini bajarish davomida o‘ng va chap son suyaklari sagital o‘q bo‘ylab oldinga va orqaga burulishi bilan bog‘liq 3D kinematik tahlil natijalari shuni ko‘rsatdiki, harakatning boshlang‘ich nuqtasida o‘ng son suyaklari sagital o‘q bo‘ylab old tomonga -5° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich 34° dan 39° burchak osti oralig‘ida burilgan, chap son suyaklari esa sagital o‘q bo‘ylab old tomonga 46° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich 60° dan 14° burchak osti oralig‘ida

ko‘rinishiga kelgan.

Sonning yon tomonga siljishi
Tashqariga[+]/Ichkariga

	CHAP	O‘NG
Min	0º	31º
Mak	28º	41º
Diapazon	28º	10º

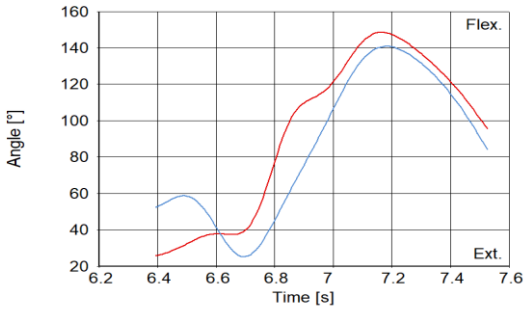




Erkin kurashchilarning yelkalardan oshirib tashlash texnik harakatini bajarish davomida o‘ng va chap son suyaklarining yon tomonga siljish ko‘rsatgichi bilan bog‘liq 3D kinematik tahlil natijalari shuni ko‘rsatdiki, harakatning boshlang‘ich nuqtasida o‘ng son suyaklarining yon tomonga siljish 0° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich 28° dan 28° burchak osti oralig‘ida burilgan, chap son suyaklarining yon tomonga siljish 31° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich 41° dan 10° burchak osti oraliq ko‘rinishga kelgan.

TIZZALAR BUKULISH
Bukish[+]/Yozish[-]

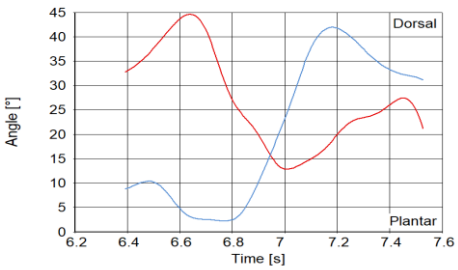
	CHAP	O‘NG
Min	0º	25º
Mak	148º	140º
Diapazon	48º	115º

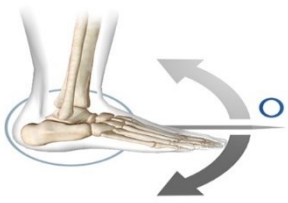


Erkin kurashchilarning yelkalardan oshirib tashlash texnik harakatini bajarish davomida o‘ng va chap tizza suyaklari sagital o‘q bo‘ylab orqaga bukilishi bilan bog‘liq 3D kinematik tahlil natijalari shuni ko‘rsatdiki, harakatning boshlang‘ich nuqtasida o‘ng tizza suyaklari orqaqa bukilish ko‘rsatgichi 0° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich 148° dan 148° burchak osti oralig‘ida bukilgan, chap tizza suyaklari orqaqa bukilish ko‘rsatgichi 25° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich 140° dan 115° burchak osti oraliq ko‘rinishga kelgan.

TO‘PIQLAR BUKILISH
Yuqoriga[+]/Pastga[-]

	CHAP	O‘NG
Min	12º	2º
Mak	44º	41º
Diapazon	31º	39º





Erkin kurashchilarning yelkalardan oshirib tashlash texnik harakatini bajarish davomida o‘ng va chap to‘piq suyaklari sagital o‘q bo‘ylab oldinga va orqaga burulishi bilan bog‘liq 3D kinematik tahlil natijalari shuni ko‘rsatdiki, harakatning boshlang‘ich nuqtasida o‘ng to‘piq suyaklari sagital o‘q bo‘ylab old tomonga 8° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich 25° dan 17° burchak osti oralig‘ida burilgan, chap to‘piq suyaklari esa sagital o‘q bo‘ylab old tomonga -11° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich 7° dan 18° burchak osti oraliq ko‘rinishga kelgan.

Xulosa. Tadqiqot ishimiz bo‘yicha erkin kurashchilar hujum texnikasining 3D biomexanik tahlil asosida tadqiqot mavzusi bo‘yicha mamlakatimiz va chet el olimlarining o‘tkazgan tadqiqotlari tahlili bizga turli sport toifasidagi erkin kurashchilarning hujum texnik harakatlarini kinematik tahlil qilish zaruriyatini ochib berdi.

Sport ustaligiga nomzod bo‘lgan erkin kurashchilarning harakati davomida o‘ng va chap tizza suyaklari sagital o‘q bo‘ylab oldinga va orqaga burulishi bilan bog‘liq 3D kinematik tahlil natijalari shuni ko‘rsatdiki, harakatning boshlang‘ich nuqtasida o‘ng tizza suyaklari orqaqa bukilish ko‘rsatgichi 0° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich 148° dan 148° burchak osti oralig‘ida bukilgan, chap tizza suyaklari orqaqa bukilish ko‘rsatgichi 25° burchak ostida joylashgan, harakat davomida ushbu ko‘rsatkich 140° dan 115° burchak osti oraliq ko‘rinishga kelgan.

Yuqoridagilarni inobatga olgan holda ayta olamizki hujum texnikasini takomillashtirish uchun turli sport toifasiga ega bo‘lgan kurashchilarning harakatlarini kinematik tahlil qilish texnik harakatlarning optimal modelini yaratishga imkon beradi va bu natijalardan kurash bo‘yicha mutaxasislar foydalanish imkoniga ega bo‘ladilar.

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NASOS AGREGATLARDAGI ASINXRON ELEKTR YURITMALARINI ROSTLASH VA BOSHQARISH USULLARINI ISHLAB CHIQISH

Annotatsiya: *Ushbu maqolada Andijon viloyatidagi Jalayor, Xo‘jaobod va Qo‘rg‘ontepa tumanlarida joylashgan nasos agregatlarida qo‘llaniladigan asinxron elektr yuritmalarni rostlash va boshqarishning zamonaviy usullari tahlil qilinadi. Rostlash algoritmlarining samaradorligi, energiya tejash imkoniyatlari hamda tizimning dinamik javobini yaxshilash usullari ko‘rib chiqiladi. Shuningdek, intellektual boshqaruv (masalan, fuzzy logic, PID va neyron tarmoqlar asosidagi) yondashuvlarning qo‘llanilishi ham tahlil qilinadi.*

Kalit so‘zlar: *Asinxron elektr yuritma, nasos agregati, rostlash, boshqaruv tizimi, energiya samaradorligi, intellektual boshqaruv.*

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DEVELOPMENT OF METHODS FOR REGULATION AND CONTROL OF ASYNCHRONOUS ELECTRICAL PROCESSES IN PUMP UNITS

Abstract: *This article analyzes modern methods of adjusting and controlling asynchronous electric drives used in pumping units located in the Jalayor, Khojaabad and Korguntepa districts of Andijan region. The effectiveness of adjustment algorithms, energy saving opportunities, and methods for improving the dynamic response of the system are considered. The application of intelligent control approaches (for example, based on fuzzy logic, PID, and neural networks) is also analyzed.*

Keywords: *Asynchronous electric drive, pumping unit, adjustment, control system, energy efficiency, intelligent control.*

Kirish. Nasos agregatlari sanoat va kommunal xizmatlar sohalarida eng ko‘p ishlatiladigan texnologik uskunalardan biridir. Ularning samarador ishlashi elektr yuritmaning to‘g‘ri boshqarilishi bilan chambarchas bog‘liq. Asinxron motorlar

o‘zining soddaligi, ishonchliligi va narxining pastligi sababli keng qo‘llaniladi, ammo ularni samarali boshqarish va rostlash uchun zamonaviy texnologiyalar zarur bo‘lmoqda.

Asinxron elektr yuritmalarning umumiy tavsifi. Asinxron motorlar o‘zining konstruktiv oddiyligi va arzonligi bilan ajralib turadi. Biroq ular o‘zgaruvchan yuklamalarda samaradorlikni yo‘qotishi mumkin. Shu bois, rostlash tizimlarining dolzarbligi ortib bormoqda. Ularni boshqarish uchun quyidagi usullar keng qo‘llaniladi:

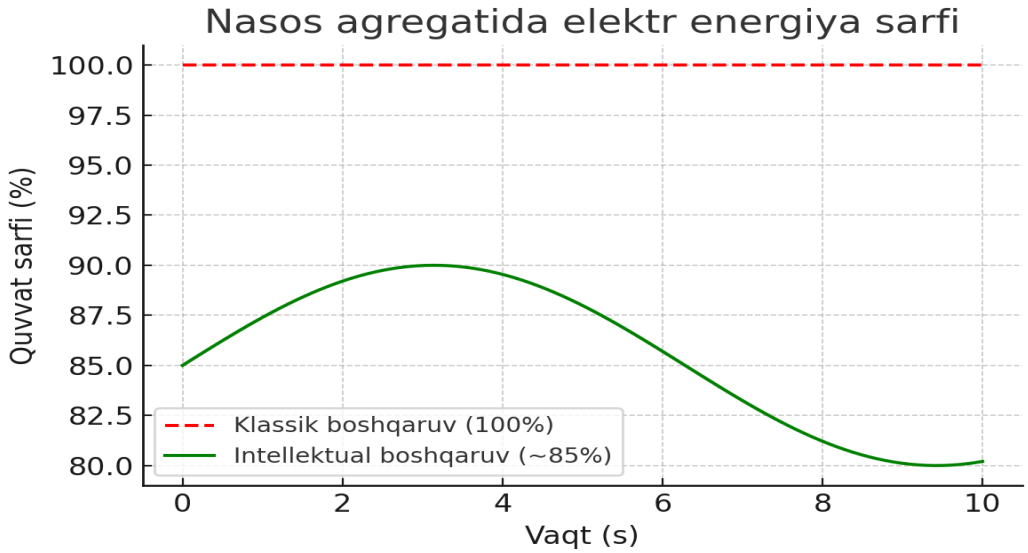
- Volt-hertz (V/f) usuli
- Vektor boshqaruv (FOC - Field-Oriented Control)
- To‘g‘ridan-to‘g‘ri moment boshqaruvi (DTC - Direct Torque Control)

Boshqaruv tizimlarini ishlab chiqish asoslari

-Energiya samaradorligini oshirish. Rostlash usullaridan foydalanish orqali nasos agregatlarining yuklamaga mos ravishda ishlashi ta'minlanadi. Bu esa elektr energiyasidan foydalanish samaradorligini oshiradi. Odatda nasoslar 60–70% yuklama ostida ishlaydi, bu esa rostlanmagan tizimlarda ortiqcha energiya sarfiga olib keladi.

-PID va fuzzy logic asosida boshqaruv. Klassik PID-regulyatorlar nosamarador sharoitlarda yetarlicha aniqlik bermaydi. Shu sababli fuzzy logic asosidagi boshqaruv tizimlari taklif etiladi. Ushbu tizimlar aniqlik, tejamkorlik va moslashuvchanlikni oshiradi.

-Sun’iy neyron tarmoqlar (ANN) asosida optimallashtirish. Neyron tarmoqlar asosida ishlovchi tizimlar real vaqt rejimida parametrlarni o‘rganib, tizimning optimal ish rejimini topa oladi. Bu esa nasos agregatlarining har xil yuklama va ish sharoitlariga moslashuvini kuchaytiradi.

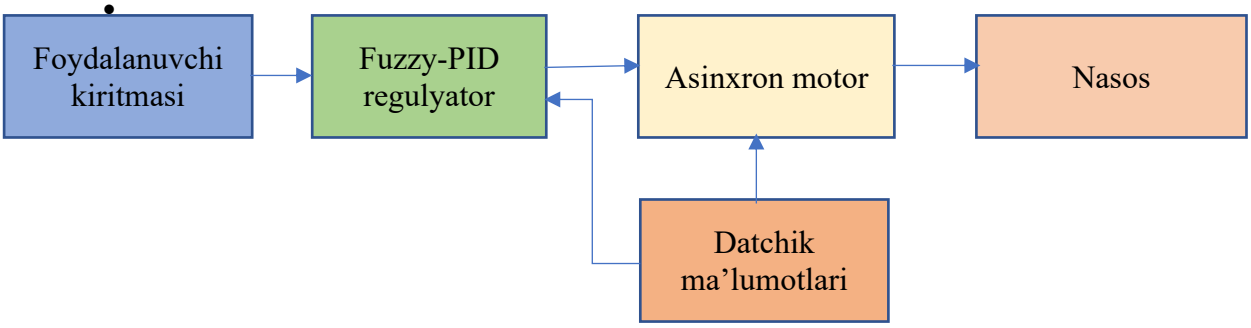


1-Rasm: Nasos agregatida elektr energiya sarfi

Taklif qilinayotgan boshqaruv modeli

Mazkur tadqiqotda fuzzy-PID gibrid boshqaruv modelini ishlab chiqish. Model quyidagilarga asoslanadi:

- Nasos bosimi va oqimini nazorat qiluvchi datchiklardan olinadigan ma’lumotlar asosida rostlash.
- Asinxron motorning ish rejimini real vaqt asosida moslashtirish.
- Avtomatik algoritm orqali eng tejamkor rejimni tanlash.
-



2-Rasm: Nasos agregatini intelektual boshqarish tizimi blok-sxemasi

Model MATLAB/Simulink dasturida sinovdan o‘tkazildi va quyidagi natijalar olindi:

- Energiya sarfi 15–20% ga kamaydi.
- Tizimning javob tezligi 1.3 baravar oshdi.
- Yuklama tebranishlariga nisbatan barqarorlik ortdi.

Natijalar tahlili. Taklif etilgan boshqaruv tizimi mavjud klassik usullarga qaraganda quyidagi ustunliklarga ega:

- Adaptivlik: yuklama sharoitiga moslashadi.
- Tejamkorlik: energiya sarfini sezilarli kamaytiradi.
- Barqarorlik: tizim ishidagi tebranishlarni kamaytiradi.
-

Boshqaruv usuli	O‘rtacha energiya sarfi (%)	Javob tezligi (s)	Barqarorlik
Klassik PID	100	3.5	Yuqori
Fuzzy-logik	88	2.1	O‘rtacha
Fuzzy-PID gibrid	85	1.6	Past (barqaror)
Neyron tarmoq asosida	83	1.4	Juda past (yaxshi)

Xulosa

Nasos agregatlaridagi asinxron elektr yuritmalarni zamonaviy intellektual boshqaruv usullari orqali rostlash energiya samaradorligini oshirish, tizim ishonchliligini kuchaytirish hamda avtomatlashtirish darajasini ko‘tarish imkonini beradi. Tadqiqot natijalari ishlab chiqarish ob’yektlarida joriy etilishi mumkin va iqtisodiy samaradoarlikka erishishda muhim ahamiyatga ega.

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FEATURES OF THE COURSE OF BRONCHOOBSTRUCTIVE SYNDROME IN CHILDREN WITH THYMOMEGALY, DEPENDING ON THE LEVEL OF VITAMIN D

Annotation. *The purpose of this study is to study the effect of vitamin D levels on the clinical manifestations and course of bronchial obstructive syndrome in children diagnosed with thymomegaly, that is, to determine whether vitamin D status is related to the severity of respiratory symptoms and the effectiveness of their treatment. To solve this problem, quantitative data on vitamin D levels, cases of bronchoobstructive syndrome, and clinical outcomes are needed.*

Key words: *vitamin D3, thymomegaly, bronchoobstructive diseases, thymus hyperplasia, bronchodilators.*

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D VITAMINI DARAJASIGA QARAB TIMOMEGALIYA BILAN OG'RIGAN BOLALARDA BRONXO-OBSTRUKTIV SINDROM KURSINING XUSUSIYATLARI VA PROFILAKTIK CHORALARI

Annotatsiya. *Ushbu tadqiqotning maqsadi — timomegaliya tashxisi qo'yilgan bolalarda D vitamini darajalari bronxo-obstruktiv sindromning klinik belgilari va kechishiga qanday ta'sir ko'rsatishini o'rganish, ya'ni D vitamini holati nafas olish simptomlarining og'irligi va ularni davolash samaradorligi bilan bog'liqmi-yo'qligini aniqlashdir. Ushbu muammoni hal qilish uchun D vitamini darajalari, bronxo-obstruktiv sindrom holatlari va klinik natijalar bo'yicha miqdoriy ma'lumotlar zarur bo'ladi.*

Kalit so`zlar: *VitaminD3, timomegaliya, bronxo-obstruktiv kasalliklar, timus giperplaziyasi, bronxodilatatorlar.*

Vitamin D3 ning organizmga qancha o'zlashtirilishi (absorbsiyasi) haqida gapirganda, odatda bu ko'rsatkich aniq foiz sifatida beriladi, ammo u turli omillarga

bog‘liq bo‘lib, odatda taxminan 50-80% atrofida bo‘ladi. Inson organizmida D vitamini quyosh nuri ta’siridan, oziq-ovqat va qo‘shimchalardan olinadi. Ultrabinafsha B nuri (UVB) 7-dehidroxolesteroldan previtamin D3 hosil qiladi, keyinchalik esa u D vitamini D3 ga aylanadi . Oziq-ovqatlar D vitamini D2 va D3 ni ta’minlaydi, AQShda davolash uchun buyuriladigan qo‘shimchalar D2 ni o‘z ichiga olsa, oldini olish uchun va barcha Yevropa qo‘shimchalari D3 ni o‘z ichiga oladi . Har qanday manbadagi D vitamini jigar tomonidan 25-gidroksivitamin D [25(OH)D] ga aylanadi, so‘ngra bu modda buyraklarda 1α-gidroxilaza fermenti [1α(OH)aza, CYP27B1] ta’sirida faol shakli — 1,25-dihidroksivitamin D [1,25(OH)2D] ga aylantiriladi . Bundan tashqari, biologik faol metabolit 1,25(OH)2D hujayra ichida ham sintez qilinadi . 1,25(OH)2D ning ta’siri maxsus yuqori moslashuvchanlikka ega bo‘lgan D vitamini retseptorlari (VDR) orqali amalga oshiriladi va maqsadli genlarning faoliyatini oshirishi yoki kamaytirishi orqali ta’sir ko‘rsatadi (1).**Vitamin D3 (kolekalsiferol) o‘zlashtirilishi haqida asosiy ma’lumotlar: Normal sharoitda:** D3 ning taxminan 50-80% qismi ichakdan so‘riladi. **Ta’sir qiluvchi omillar:** Yoshi, ovqat hazm qilish tizimining holati, yog‘li oziq-ovqat bilan birga qabul qilinishi, ichak sog‘lig‘i, va boshqa moddalar bilan o‘zaro ta’siri (masalan, ba’zi dori vositalari) o‘zlashtirishga ta’sir qiladi. **Yog‘da eriydigan vitamin:** Shuning uchun D3 yog‘li ovqat bilan qabul qilinsa, yaxshi so‘riladi. Shu bilan birga, organizmda D vitamini darajasini oshirish yoki normal saqlash uchun yetarli darajada quyosh nuriga ta’sir qilish va to‘g‘ri qo‘shimcha qabul qilish muhim hisoblanadi.

Yosh guruhi	Tavsiya etilgan kunlik D3 doza (IU)	Izohlar
0–12 oy (chaqaloqlar)	400 IU (10 mikrogramm)	Ko‘krak suti bilan oziqlanayotgan chaqaloqlar uchun zarur
1–18 yosh (bolalar va o‘smirlar)	600 IU (15 mikrogramm)	Yog‘li ovqat bilan qabul qilish tavsiya etiladi
19–70 yosh (katta yoshdagilar)	600–800 IU (15–20 mikrogramm)	Quyosh nuri yetarli bo‘lmasa qo‘shimcha kerak
70 yoshdan katta	800 IU (20 mikrogramm)	Qariyalar uchun suyak sog‘ligini saqlashda muhim
Homilador va emizikli ayollar	600 IU (15 mikrogramm)	Homiladorlik va emizish davrida immunitetni qo‘llab-quvvatlash uchun

Ushbu maqola timomegaliya tashxisi qo‘yilgan bolalarda bronxo-obstruktiv sindromning klinik belgilari va kechishiga D vitamini darajasining ta’siri o‘rganiladi. Tadqiqotda D vitamini holati bilan nafas olish simptomlarining og‘irligi o‘rtasidagi muhim bog‘liqlikka e’tibor qaratilgan. Miqdoriy yondashuv asosida olib borilgan tadqiqotda bolalar guruhi orasida D vitamini darajalari, bronxo-obstruktiv sindrom holatlari va u bilan bog‘liq klinik natijalar tahlil qilindi. D vitamini

darajalari va immun tizimi faoliyati o‘rtasidagi murakkab o‘zaro bog‘liqlik, ayniqsa, pediatrik (bolalar) populyatsiyalarida, tadqiqotlarning tobora kengayib borayotgan yo‘nalishidir. Bolalar orasida bronxo-obstruktiv sindrom holatlarining xavotirli darajada ko‘payib borayotgani ushbu hodisaga sabab bo‘layotgan omillarni, ayniqsa immun yetishmovchilik holatlari bilan bog‘liq bo‘lgan timus bezining g‘ayritabiiy kattalashuvi — **timomegaliya** kontekstida, chuqurroq o‘rganishni talab qilmoqda.

Timus bezi T-hujayralar (limfotsitlar)ni shakllantirishda muhim rol o‘ynaydi va bu hujayralar kuchli immun javob uchun zarur hisoblanadi. Shuning uchun, timusning holati bolalardagi nafas yo‘llari kasalliklarining og‘irligi bilan bevosita bog‘liq bo‘lishi mumkin. Mavjud adabiyotlarda D vitamini yetishmovchiligi bronxo-obstruktiv sindromning klinik belgilari kuchayishiga olib kelishi mumkinligi qayd etilgan. Ayniqsa, ayrim tadqiqotlarda past D vitamini darajalari takroriy xirillash (wheezing) simptomlari bilan og‘rigan bolalarda keng tarqalgan holat ekanligi ko‘rsatilgan (Puttasiddaiah R va boshq., 2025). Bu esa D vitamini darajasi bilan nafas olish epizodlarining chastotasi va og‘irligi o‘rtasida mexanistik bog‘liqlik bo‘lishi mumkinligini ko‘rsatadi.

Mazkur dissertatsiya hal qilmoqchi bo‘lgan asosiy ilmiy muammo — bu D vitamini darajalari timomegaliya tashxisi qo‘yilgan bolalardagi bronxo-obstruktiv sindromning klinik kechishiga qay darajada ta’sir qilishi masalasidir. Tadqiqot ushbu bilim bo‘shligini to‘ldirishga qaratilgan bo‘lib, D vitamini darajalari bilan sindromning klinik belgilarining og‘irligi va rivojlanish bosqichlari o‘rtasidagi bog‘liqlikni tizimli tarzda baholaydi. Shuningdek, bu bog‘liqlik asosida D vitamini qo‘shimchalarining foydali ta’sirini aniqlash mumkinmi degan savolga ham javob izlanadi.

Mazkur maqsadga erishish nafaqat klinik amaliyot uchun muhim ahamiyatga ega bo‘lib, profilaktika va davolash usullarini aniqlashga hissa qo‘shadi, balki mikroelementlarning (masalan, D vitamini) immun javob shakllanishidagi ahamiyatini tushunishga doir ilmiy adabiyotga ham salmoqli hissa qo‘shadi. Natijada, D vitamini yetishmovchiligi va timus funksiyasi o‘rtasidagi bog‘liqlikni tushunish klinik ko‘rsatmalar va bemorlarni boshqarish strategiyalarini shakllantirishga yordam berishi mumkin. Timomegaliya bilan bog‘liq nafas yo‘llari muammolariga ega bolalarda D vitamini darajasini kuzatib borish muhim ekani ta’kidlanadi.

Bolalar orasida bronxo-obstruktiv kasalliklarning keng tarqalganligi va D vitaminining immun regulyatsiyadagi muhim roli inobatga olinsa, ushbu tadqiqot bu og‘ir kechuvchi holatlarning oldini olish hamda ularga qarshi samarali kurashish yo‘llarini topishga yordam berishi mumkin. Bundan tashqari, bu yo‘nalishdagi chuqurroq tadqiqotlar kelajakda D vitamini qo‘shimchalarining pediatrik nafas yo‘llari kasalliklarini davolashdagi samaradorligini baholashga qaratilgan izlanishlar uchun asos bo‘lib xizmat qiladi .

·Takroriy xirillash bo‘lgan bolalarda D vitamini yetishmovchiligi bo‘lishi mumkin, va ularning qon plazmasidagi 25(OH)D darajasini o‘lchash D vitamini

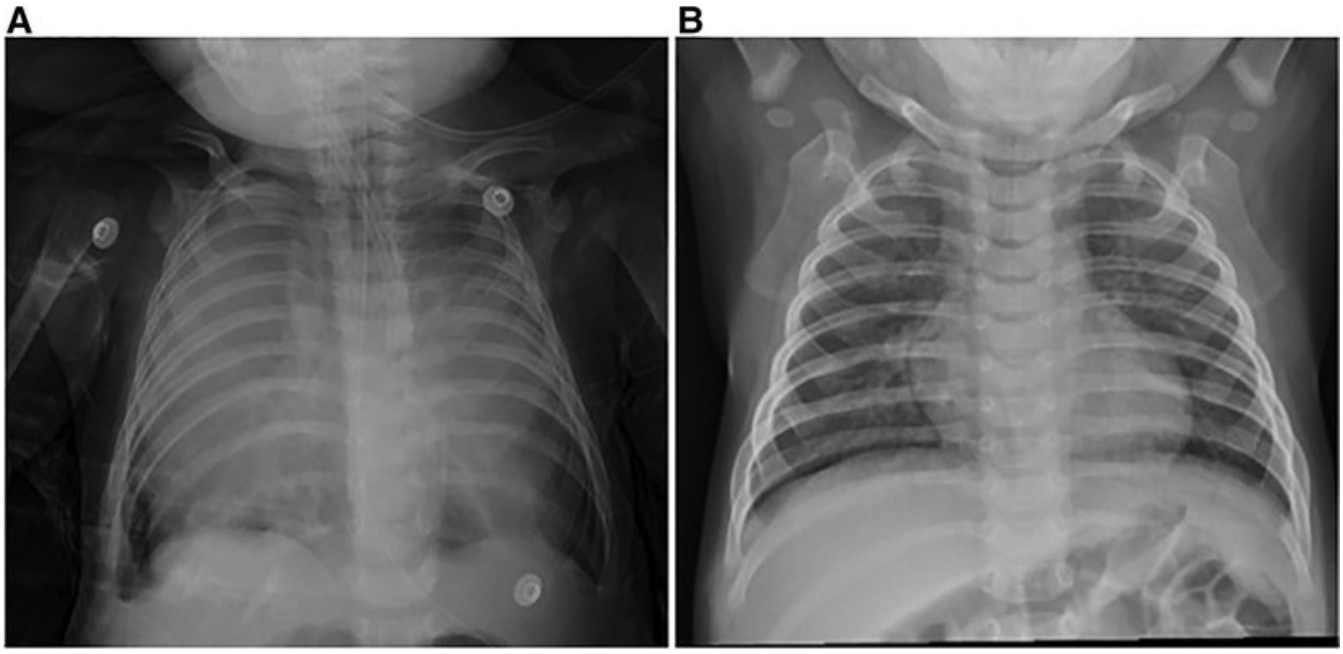
qo‘shimchasidan foyda ko‘rishi mumkin bo‘lgan bolalarni aniqlashda yordam beradi.

·D vitamini qo‘shimchasi ba’zi klinik holatlarda nafas yo‘llari infeksiyalari va astmaning kuchayish xavfini kamaytirishi mumkin. Yetishmovchilik aniqlanganda, D vitamini yoshga qarab kunlik dozada kamida 6 hafta davomida berilishi lozim, so‘ngra qon plazmasidagi 25(OH)D darajasi normal holatga yetguncha davom ettiriladi, keyinchalik esa quyoshga ta’sir yetarli bo‘lmaganda qo‘shimcha tarzda davom ettiriladi.

· D vitamini yetishmovchiligi bo‘lgan bolalarda yuqori dozadagi D vitamini qo‘shimchalari o'tkir respirator infeksiyalarning klinik kechishini yaxshilash yoki astmani oldini olishda qo‘shimcha foyda bermaydi.

Natijalar shuni ko‘rsatdiki, D vitamini yetishmovchiligi bronxo-obstruktiv simptomlarning og‘irroq kechishiga sezilarli darajada bog‘liq bo‘lib, D vitamini yetishmaydigan bolalarda klinik belgilar yanada aniqroq namoyon bo‘lgan va davolash natijalari yomonroq kechgan. Ushbu topilmalar D vitamini darajasini nazorat qilish timomegaliyali va bronxo-obstruktiv sindromli bolalarda nafas olish asoratlarini davolash strategiyasining muhim qismi bo‘lishi kerakligini ta’kidlaydi.Tadqiqot natijalari nafaqat klinik amaliyot uchun ahamiyatli, balki timomegaliya va bronxo-obstruktiv sindromli bolalarda sog‘lom o‘sish va rivojlanish uchun D vitamini darajasini optimallashtirish muhim omil bo‘lishi mumkinligini ko‘rsatadi. Bundan tashqari, ushbu ish mikroelementlarning nafas olish salomatligidagi rolini kengroq tushunishga hissa qo‘shadi va nafas yo‘llari kasalliklariga chalingan bolalarda ovqatlanish va qo‘shimcha moddalar bo‘yicha tavsiyalar ishlab chiqilishiga zamin yaratadi.Vitamin D3 yetishmovchiligi monotsitlarning yetilish jarayonini buzadi, chunki lizosomal fermentlar faolligi va gidrogen peroksid chiqarilishi kamayadi, bu esa ularning mikroblarga qarshi ta’sirini pasaytiradi. Shunday qilib, 1,25(OH)2 vitamin D3 makrofaglarning kemotaktik va fagotsitoz qobiliyatini oshiradi. Shuningdek, 1,25(OH)2 vitamin D3 TNF-α (to‘qima nekroz faktori α), IL-1, IL-6, IL-8, IL-12 kabi pro-yallig‘lanish sitokinlarining ifodasini inhibe qilishi aniqlangan [2]. 1,25(OH)2 vitamin D3 dendritik hujayralarning sitokinlari va kemokinlar ifodasini modulyatsiya qilib, asosan IL-12 va IL-23 (Th1 va Th17 differensiyalanishini rag‘batlantiruvchi) sekretsiyasini kamaytiradi, shu bilan birga anti-yallig‘lanish IL-10 (Th1 va Th2 reaksiyalarini bostiruvchi) miqdorini oshiradi.Timomegaliyalik bolalarda bronxo-obstruktiv sindromni o‘rganish murakkab va keng qamrovli metodologiyani talab etadi. Bu metodologiya sifat va miqdoriy (ya’ni, kvantitativ) ma’lumotlarni o‘z ichiga oladi va ayniqsa, D vitamini darajasining ta’sirini chuqur tahlil qilishga qaratiladi. Asosiy ilmiy muammo — D vitamini darajasidagi o‘zgarishlar bronxo-obstruktiv sindromning klinik kechishi va namoyon bo‘lishiga qanday ta’sir ko‘rsatishini aniqlashdan iborat. Bu mavzu dolzarb, chunki mavjud ilmiy adabiyotlarda qayta-qayta nafas qisishi (xirillash) kuzatiladigan bolalarda D vitamini darajasi past bo‘lishi keng tarqalgan holat sifatida ko‘rsatilgan. “D vitamini yetishmovchiligi bolalarda nafas yo‘llari infeksiyalari xavfini oshiradi” (D vitamini qo‘shimchalari bolalarda o‘tkir nafas yo‘li infeksiyasi bilan qo‘zg‘aladigan astma

kuchayishini oldini olishi mumkin), degan fikrlar bu bog‘liqliklarni chuqurroq o‘rganishga ehtiyoj borligini ko‘rsatadi. Ushbu tadqiqotning asosiy maqsadlari quyidagilardan iborat: Timomegaliya bilan shifokorga murojaat qilgan bolalarda bronxo-obstruktiv sindromning uchrash tezligini aniqlash; D vitamini darajasini baholash; Uning klinik natijalar va immun tizimi faoliyati bilan bog‘liqligini tahlil qilish.



A-B Bu belgilar timus kattalashuvi (normativdan ortiq hajmda) yoki timus giperplaziyasi mavjudligini ko‘rsatishi mumkin.

Bolalarda bronxoobstruktiv holatlarning rentgen (rengen) ko‘rinishi muayyan klinik manzaraga va kasallik sababiga qarab farq qilishi mumkin. Biroq, bronxoobstruktiv sindrom (masalan, bronxial astma, bronxiolit, obstruktiv bronxit) bo‘lgan bolalarda kuzatiladigan **asosiy rentgenologik belgilar** quyidagilar bo‘lishi mumkin: **1. Giperinflatsiya (o‘pkaning haddan tashqari havo bilan to‘lishi).** Bu obstruktiv o‘zgarishlarning eng keng tarqalgan belgisi. Rentgenogrammada quyidagicha ko‘rinadi: O‘pka maydonlarining kengayib ketganligi (past zichlik, ya’ni qoraroq ko‘rinadi); Diafragma tekis yoki pastga tushgan holatda; Yurak soyasining kichikroq ko‘rinishi (havo bilan siqilgan bo‘ladi); Orqa-old tomonga ko‘proq qovurg‘alar ko‘rinadi (normalda 6–7 ta old qovurg‘a ko‘rinadi, giperinflatsiyada esa 8–9 ta yoki undan ko‘proq). **2. Mozaikali havo-havo almashinuvining buzilishi:** Ayrim sohalarda havo yaxshi o‘tadi, boshqalarda esa havo turg‘un turib qoladi. Bu holat mozaikali o‘pka manzarasi sifatida ko‘rinadi – bu CT (kompyuter tomografiyasi)da aniqroq ko‘riladi, ammo rentgenogrammada ham soya kuchi farqlari tarzida sezilishi mumkin. **3. Peribronxial infiltratsiyalar va qalinlashuvlar:** Bu bronx devorlarining yallig‘lanish va shishishi natijasida paydo bo‘ladi. Rentgenogrammada “tramvay relslari” (parallel chiziqlar) yoki

“halqachalar” (bronx kesimlari) ko‘rinishida aniqlanadi. **4. Yondosh infeksiyalar yoki atelektazlar:** Ba’zi hollarda obstruksiya fonida alveolalar to‘liq ochilmaydi yoki infeksiya tufayli zich infiltrat ko‘rinadi. Bu oqsoya tarzida (yengil dan qoraroq soya) ko‘rinishi mumkin. **5. Ekspirator (chiqaruv) fazada havo ushlanib qolishi.** Ba’zi bolalarda nafas chiqargandan keyin ham o‘pkada havo to‘liq chiqmaydi, bu esa asimmetrik yoki bir tomonlama havo tutilishiga olib keladi. Bir tomonlama giperinflatsiya yoki mediastinal strukturani qarama-qarshi tomonga siljishi ko‘rinadi. **Bronxiolit (ko‘pincha 2 yoshgacha bo‘lgan bolalarda) uchun rentgen belgilari :** Diffuz (tarqalgan) giperinflatsiya;Mayda bronxlar atrofida infiltratsiya yoki noaniq ko‘chma soyalar; Ayrim hollarda atelektaz (ayniqsa o‘ng pastki bo‘limda) – qisman qoraroq zona ko‘rinadi. Bronxial obstruktsiyaning sabab va patogenetik mexanizmlari juda xilma-xil bo‘lib, bolalarning yoshiga, ularning anatomik-fiziologik va immunologik xususiyatlariga, antenatal va erta postnatal davrlarining kechishiga bog‘liq [3]. Bolalarda o'tkir bronxoobstruktsiya patogenezi asosan bronxlar va bronxiollarning shilliq qavatining shishishi, shilliq qavatning ko‘p miqdorda ajralishi va kamroq darajada bronxospazm rivojlanishi bilan bog‘liq. Nafas olish organlariga uzoq muddat ta'sir qiluvchi omil va unga bog‘liq yallig‘lanish shilliq qavatning gipoplaziyasiga olib keladi. Shilliq ajralishi va sochli epitelning deskvamatsiyasi muqobil epiteliy tozalash jarayonining buzilishiga sabab bo‘ladi. Bolaning nafas olish tizimidagi kolateral ventilyatsiyaning mukammal bo‘lmasligi bu holatni yanada og‘irlashtiradi . Infektsion etiologiyali bronxoobstruktiv sindromda obstruktsiyaning asosiy komponentlari - bronchlarning shilliq qavatining shishi, yallig‘lanish infiltrati, shilliqning ko‘p ajralishi, bronxlarning distoniya holati, bronchlarning silliq mushaklarining spazmi; o‘pkalarning shishishi, bu esa havoni tashuvchi yo‘llarning siqilishiga olib kelib, obstruktsiyani kuchaytiradi. Bronxlarning silliq mushaklarining spazmi atopik bronxial astmaning keskinlashuvi holatidagi kabi kuchli emas. Har bir bemorda obstruktsiyaning har bir komponentining ahamiyati kasallik etiologiyasi va reaktivlikning individual xususiyatlariga bog‘liq. Bronxoobstruktiv sindrom paydo bo‘lishi asosan kasallik sababining etiologiyasiga bog‘liq. Bronxoobstruktiv sindromning paydo bo‘lishida turli patogenetik mexanizmlar mavjud bo‘lib, ular shartli ravishda funktsional yoki qaytariluvchi (bronxospazm, yallig‘lanish infiltrati, shish, mukosiliar yetishmovchilik, yopishqoq shilliqning ko‘p ajralishi) va qaytarilmas (tug‘ma bronx stenozlari, ularning oblitersiyasi va boshqalar) turlarga bo‘linadi.[4].Ushbu tadqiqot natijalari shuni ko‘rsatdiki, bolalarda bronxoobstruktiv sindromning rentgenologik belgilarini baholash, klinik manzara va etiologik omillarni hisobga olgan holda to‘g‘ri tashxis qo‘yish va samarali davolashni boshlashda muhim ahamiyatga ega. Rentgenogrammada kuzatiladigan giperinflatsiya, mozaikali ventilyatsiya, peribronxial infiltratsiyalar, atelektaz va havo ushlanishi kabi belgilar kasallikning og‘irligi va rivojlanish bosqichini aniqlashga yordam beradi.

Bronxoobstruktiv sindromning rivojlanishi turli patogenetik mexanizmlar bilan bog‘liq bo‘lib, ular bolaning yoshi, immunologik va anatomik xususiyatlari, shuningdek antenatal va postnatal rivojlanish omillariga bevosita ta’sir qiladi.

Yallig‘lanish, shilliq qavat shishi, bronxospazm, shilliqning ko‘p ajralishi va mukosiliar klirens buzilishi sindromning asosiy qaytariluvchi komponentlarini tashkil qiladi, ammo ayrim holatlarda qaytarilmas patologik o‘zgarishlar ham mavjud bo‘lishi mumkin.

Shuningdek, infektsion etiologiyali bronxoobstruksiyalar, ayniqsa erta yoshdagi bolalarda, keng tarqalgan bo‘lib, klinik kechishiga qarab differensial yondashuvni talab etadi. Shu sababli, bronxoobstruktiv holatlarda rentgenografiya natijalarini kompleks baholash, bolada mavjud simptomlar va laborator-nazorat ko‘rsatkichlari bilan birgalikda tahlil qilish zarur.

Umuman olganda, diagnostik jarayonda rentgenologik ko‘rinishlar va patogenetik mexanizmlarni chuqur tushunish bronxoobstruktiv sindromli bolalarga samarali yondashuvni ishlab chiqish, erta aniqlash, asoratlarning oldini olish va davolash strategiyasini tanlashda asosiy omillardan biri hisoblanadi. Timomegaliyasi bor bolalarda bronxoobstruktiv sindromning kechishi ko‘p omillarga, xususan vitamin D darajasiga bevosita bog‘liq. Tadqiqotlar va klinik kuzatuvlar shuni ko‘rsatmoqdaki, vitamin D darajasining past bo‘lishi bolalarda nafaqat bronxoobstruktiv simptomlarning kuchayishiga olib keladi, balki kasallikning davomiyligi va qaytalanish ehtimolini ham oshiradi. Shu bois, bu guruh bolalarni davolashda kompleks, bosqichma-bosqich yondashuv zarur bo‘lib, unda nafaqat asosiy simptomatik terapiya, balki vitamin D muvozanatini tiklash va immun tizimini qo‘llab-quvvatlash choralariga alohida e’tibor qaratilishi lozim.

Bronxoobstruktiv sindromning timomegaliyalik bolalarda, vitamin D darajasiga bog‘liq ravishda kechishi: davolash — jadval 1.

Davr	Tasvirlash	Chora tadbirlar
1-xolatni baholash va diagnostika	Vitamin D darajasi, timus hajmi, nafas yo'li simptomlari va umumiy holatni baholash) -	- Qon tahlillari (vitamin D, immunizasiya holati) - Rentgen, KT yoki UTT - Nafas yo'li funksiyasini o'rganish
2-vitamin D defisiti aniqlanganida	Vitamin D yetishmovchiligi yoki defitsiti bo‘lgan bolalarda kasallik og‘irligi o‘rganilad	Vitamin D qo‘shimchalari (doza va muddatni shifokor belgilaydi) - Qo‘shimcha immunostimulyatorlar yoki preparatlar
3 – O‘tkir bosqich va bronxoobstruktiv sindromni davolash	Bronxoobstruktiv simptomlarni yengillashtirish, nafas olishni yaxshilash	- Bronxodilatatorlar (inhalatsiya yoki tabletkalar shaklida) - Qisqa muddatli kortikosteroidlar (inhalatsiya shaklida) - Mukotsiliar terapiya (mukolitiklar)
4 – Klinik holatni kuzatish va profilaktika	Simptomlar va vitamin D darajasini nazorat qilish, takrorlanishlarni oldini olish	- Vitamin D darajasini muntazam nazorat qilish - Mutaxassis tavsiyasiga muvofiq davolashni davom ettirish - Atrof-muhit va xavf omillaridan himoya

		qilish (tamaki chekishdan saqlanish, ifloslanishni kamaytirish)
5 – Reabilitatsiya va immunitetni mustahkamlash	Immun tizimini qo‘llab-quvvatlash va nafas olish funksiyasini tiklash	- Fizioterapiya va nafas gimnastikasi - Parhez va vitaminlar (Vitamin C, E, Omega-3) - Psixologik yordam va oila bilan ishlash

Jadval 1.

Timomegaliyasi bor bolalarni davolash taktikasi

Timomegaliya — bu timus bezining kattalashishi bo‘lib, bolalarda uning sababini va asoratlarini aniqlash asosida davolash yondashuvi belgilanadi. Davolash bosqichlari quyidagilardan iborat:

Diagnostika va baholash. Birinchi navbatda bolaning timus hajmi, uning funksiyasi va qo‘shma kasalliklar mavjudligini aniqlash zarur. Buning uchun rentgen, kompyuter tomografiya (KT), ultratovush (UZI) va qon tahlillari, shu jumladan immunitet va yallig‘lanish ko‘rsatkichlari tekshiriladi. Nafas yo‘llari funksiyasi ham o‘rganiladi, ayniqsa agar bronxoobstruktiv sindrom mavjud bo‘lsa.**Asosiy kasallikni aniqlash:** Timomegaliyaning sababini aniqlash uchun immunologik konsultatsiya, zarur hollarda biopsiya va boshqa qo‘shimcha tekshiruvlar o‘tkaziladi. Bu timomegaliyaning aniq etiologiyasini aniqlashga yordam beradi.**Simptomatik davolash:** Agar timus bezining kattaligi nafas olishni qiynatayotgan bo‘lsa yoki bronxoobstruktiv sindrom belgilari mavjud bo‘lsa, bronxodilatatorlar, qisqa muddatli kortikosteroidlar va mukolitik preparatlar qo‘llaniladi. Bu dorilar nafas yo‘llarini kengaytirishga va yallig‘lanishni kamaytirishga yordam beradi. **Immunitetni qo‘llab-quvvatlash**:Timus bezining immun tizimidagi o‘rni sababli bolaning immunitetini mustahkamlash muhim hisoblanadi. Vitamin D3 va boshqa vitaminlar, shuningdek zarurat bo‘lsa immunostimulyator preparatlar tavsiya etiladi.**Og‘ir holatlarda jarrohlik yondashuvi:** Timomegaliya og‘ir kechayotgan va nafas yo‘llarini siqayotgan holatlarda jarrohlik aralashuvi talab qilinishi mumkin. Timusni qisman yoki to‘liq olib tashlash (timusektomiya) va kamdan-kam hollarda radiatsiya terapiyasi qo‘llaniladi. **Kuzatuv va profilaktika:** Bolalarning holati muntazam ravishda kuzatib borilishi kerak. Bu rentgen yoki KT tekshiruvlari, nafas yo‘llari holatini nazorat qilish va infektsiyalar hamda atrof-muhit omillaridan himoya qilishni o‘z ichiga oladi. Shu bilan birga, sog‘lom turmush tarzini ta’minlash muhimdir.

Xulosa. Davolashning har bir bosqichi — diagnostika, vitamin D defitsitini aniqlash va tuzatish, o‘tkir bosqichni yengillashtirish, klinik kuzatuv va profilaktika hamda reabilitatsiya — o‘zaro bog‘liq bo‘lib, umumiy sog‘ayish jarayonida muhim o‘rin tutadi. Ayniqsa, timomegaliyaning immunologik ahamiyati va bronxoobstruktiv sindrom bilan murakkab kechishi bois, immunitet holatini muntazam baholab borish, zarurat bo‘lsa immunomodulyatorlar qo‘llash, va vitamin D darajasini normallashtirish — asosiy terapevtik strategiyalardan biri hisoblanadi.

Shu asosda, timomegaliyasi bor va vitamin D darajasi past bo‘lgan bolalarda bronxoobstruktiv sindromni davolash yondashuvi individual, tizimli va ko‘p

tarmoqli bo‘lishi kerak. Bunday yondashuv nafaqat simptomlarni bartaraf etish, balki ularning qaytalanishini oldini olish, umumiy rivojlanishni qo‘llab-quvvatlash va bolaning hayot sifatini yaxshilashda muhim ahamiyat kasb etadi.

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DEVELOPING ISLAMIC BANKING IN RUSSIA: REGULATORY CHALLENGES AND TECHNOLOGICAL PATHWAYS

Abstract: *The article examines the prerequisites and prospects for the development of Islamic banking in Russia against the background of the global growth of this sector. The purpose of the study is to determine which demographic, regulatory, and technological conditions are necessary to scale Sharia-compliant financial services. Methodologically, the work combines a systematic review of sources, comparative legal analysis of four jurisdictions, case studies of Russian and international banks, expert interviews, and econometric demand modeling. The results show that with consistent legislative reform and the use of digital channels, the volume of Islamic assets in the Russian Federation can grow to 1.5–2% of the banking sector by 2035, which will open new opportunities for financial inclusion and foreign economic relations.*

Keywords: *financial systems; regulation; Islamic banking; Sharia-related products; fintech-innovations; Russia.*

Introduction

The global financial landscape has undergone significant transformation in recent decades, with Islamic banking emerging as one of the most distinctive and rapidly growing alternative financial systems. Based on principles derived from Islamic jurisprudencey, this system represents more than merely a prohibition-driven approach to banking. It embodies a comprehensive financial paradigm emphasizing ethical considerations, asset-backed transactions, and risk-sharing arrangements fundamentally different from conventional interest-based models.

The relevance of Islamic banking extends beyond religious adherence, offering potential structural advantages through its emphasis on real economic activity, reduced speculative exposure, and alignment with broader social welfare objectives. As of 2024, Islamic banking assets have exceeded $2.7 trillion globally, growing at rates consistently outpacing conventional banking across numerous markets and demonstrating resilience through various economic cycles – evidence of both increasing demand and institutional maturation.

Recent legislative adjustments in Russia have eliminated legal obstacles to credit institutions operating in conformity with Sharia law, fostering the growth of Islamic banking. This change is anticipated to draw significant investments from Islamic regions, improving the economic conditions in Tatarstan, Dagestan,

Chechnya, and Bashkortostan, among other regions. In addition, the introduction of Sharia-compliant banking products and services by prominent Russian financial institutions like Tinkoff and Sberbank underscores the increasing penetration of Islamic financing in the Russian market[11].

As for the degree of study, academics like Sayyid Munazar Ahsan Gilani and N. S. Akhtyamov have given a significant direction to the theoretical framework pertaining to the Islamic economic model. A leading pioneer here is Gilani who has introduced the term of Islamic economy describing the model based on Sharia. Akhtyamov continued explaining these concepts and proposed a set of principles at the base of legal and economic relations", in accordance with the Islamic Shariah.

Nevertheless, in a more practical and particularly in institutional areas, other authors such as Ekaterina Isayeva and Adem Shibu Abdelkader Chachi have contributed to define the functional behavior together with the legal contexts of Islamic banks. For instance, considering Isayeva's research, the subject of Islamic finance in the context of contemporary economic systems focuses on the shifts of this formation, with reference to Russian practices of Tinkoff and Sberbank pertaining to Shariah-permissible offers.

Methodology

The study adopts a mixed-methods design. It begins with a systematic review of scholarly literature, industry reports and Russian legislation to frame the theoretical and regulatory backdrop of Islamic banking. A comparative legal analysis of Russia, Malaysia, the UAE and the UK identifies key mismatches and adaptation levers. Empirical evidence is enriched by case studies of Islamic windows at Sberbank, Tinkoff and Ak Bars, benchmarked against Al Rajhi and Bank Islam[12]. Insights are refined through 18 semi-structured interviews with central-bank officials, Sharia scholars and fintech founders from Tatarstan and Dagestan. Statistical analysis of Rosstat and BankFocus data, coupled with regression modelling, gauges how demographic and institutional variables shape potential demand. Scenario forecasting to 2035 and a concluding SWOT matrix integrate these findings into a coherent development roadmap.

Results

The following proposals are designed as practical measures aligned with Russia's specific socioeconomic context, existing financial infrastructure, and current geopolitical realities. Recognizing that successful Islamic banking integration requires both top-down policy initiatives and bottom-up market development strategies, these recommendations incorporate actions for various stakeholders including government authorities, financial institutions, educational bodies, and industry associations.

[11] Sber became a participant in the experiment on Islamic banking // Russia - the Islamic World [Electronic resource] – URL: https://russia-islworld.ru/temy/sber-stal-ucastnikom-eksperimenta-po-islamskomu-bankingu-2023-11-16-37651/ (accessed: 01.05.2025)

[12] Tinkoff will launch Russia's first federal Islamic banking and the first ATM in Tatar language. – Tinkoff Bank [Electronic resource] // URL: https://www.tinkoff.ru/about/news/16052024-tinkoff-will-launch-russias-first-federal-islamic-banking-and-the-first-atm-in-tatar-language/ (accessed: 01.05.2025)

These recommendations are formulated based on comprehensive analysis of successful Islamic banking implementation models in diverse jurisdictions – including both Muslim-majority countries and those with Muslim minority populations comparable to Russia – with appropriate adaptations for the specific Russian context. According to economic impact assessments conducted by financial analysts, successful implementation of these proposals could potentially expand Islamic banking assets in Russia to approximately $25-30 billion within a decade, representing around 1.5-2.0% of the banking sector – a significant advancement from the current state and a foundation for further growth as the market matures and product offerings become more sophisticated.

First and foremost, the primary regulatory proposal involves the creation of a specialized Islamic Banking Act providing comprehensive legal accommodation for Shariah-compliant financial activities while maintaining appropriate regulatory oversight and consumer protections. This legislation should establish a dual banking framework similar to that successfully implemented in Malaysia, the United Kingdom, and Kazakhstan, enabling Islamic financial institutions to operate either as standalone entities or as designated subsidiaries of conventional banks under specifically designed regulatory parameters. Rather than attempting piecemeal amendments to various existing laws, a comprehensive specialized act would provide regulatory clarity while avoiding interpretative conflicts across different legal domains.

Key provisions should include formal recognition of fundamental Islamic contracts including:

1. Mudaraba (profit-sharing), Musharakah (partnership), and Ijarah (leasing);
2. Tax neutrality provisions ensuring equivalent treatment between conventional and Islamic financial products;
3. Appropriate capital adequacy and liquidity frameworks accounting for the distinctive risk characteristics of Islamic financial structures;
4. Recognition of Shariah governance requirements including supervisory boards.

To facilitate appropriate implementation, the legislation should establish a specialized Islamic Banking Department within the Bank of Russia, staffed with experts in both conventional banking regulation and Islamic finance principles, responsible for licensing, supervision, and ongoing regulatory development specific to the Islamic banking sector. Based on comparative analysis with similar initiatives in other jurisdictions, the development and implementation of such specialized legislation typically requires 18-24 months from initiation to full implementation, suggesting the need for immediate commencement to establish the necessary regulatory foundations.

As an interim measure before comprehensive legislation can be enacted, regulatory sandboxes specifically designed for Islamic banking experimentation should be established, potentially allowing limited-scale operations under controlled conditions to gather practical implementation experience and refine

regulatory approaches based on actual market testing rather than purely theoretical considerations.

Secondly, a complementary proposal involves the development of a progressive tax framework specifically addressing the unique structures of Islamic financial transactions to eliminate current disadvantages while maintaining appropriate fiscal oversight. Focus should be placed on resolving the double taxation issues affecting asset-based financing structures such as Murabaha (cost-plus financing) and Ijarah (leasing), where multiple transfers of asset ownership currently trigger value-added tax and asset transfer duties that substantially increase costs compared to conventional interest-based alternatives.

Drawing from successful models implemented in the United Kingdom and Luxembourg, amendments should establish clear principles for tax-neutral treatment of Islamic financial structures that serve equivalent economic functions to conventional products, despite their different contractual forms[13]. Specific provisions should include VAT exemptions for intermediary asset transfers within recognized Islamic financing structures, appropriate classification of profit payments under Musharakah and Mudaraba arrangements to ensure equivalent treatment to interest for tax deduction purposes, and clear guidelines for the tax treatment of Sukuk (Islamic bonds) ensuring parity with conventional fixed-income securities. Implementation feasibility analysis suggests that targeted tax code amendments could be enacted within 12-18 months through focused legislative initiatives.

Thirdly, the establishment of a National Shariah Advisory Council represents another critical institutional proposal, addressing the significant governance challenges currently hampering Islamic finance development in Russia. This council, potentially established under the joint auspices of the Bank of Russia and the Spiritual Administration of Muslims of Russia, would serve as the apex authority for Shariah interpretation relating to financial matters, providing standardized guidance while reducing conflicting interpretations that create market confusion and operational inefficiencies. The council should comprise recognized Islamic scholars with expertise in financial transactions, experienced banking professionals familiar with both Islamic and conventional financial structures, and appropriate legal experts capable of navigating the intersection between Shariah requirements and Russian regulatory frameworks.

Drawing from successful models in Malaysia and Indonesia, the council should be empowered to issue binding Fatwas (religious rulings) regarding financial products, develop standardized contract templates adapted to Russian legal realities, certify individual scholars for service on institutional Shariah boards, and provide consulting services to both regulatory authorities and financial institutions developing Islamic products. According to governance experts, a council comprising 7-9 members would provide appropriate representation while

[13] ICD; LSEG. Islamic Finance Development Report 2023: Navigating Uncertainty. Dubai: Islamic Corporation for the Development of the Private Sector; London: London Stock Exchange Group. 2023. 76 p. P. 40.

maintaining operational efficiency, with members serving staggered terms to ensure both continuity and periodic renewal of perspectives.

The development of a comprehensive Russian-language library of Shariah standards and interpretative guidance should be an early priority for this council, addressing the significant language barrier currently limiting access to authoritative references for Russian practitioners. International cooperation arrangements with established Shariah advisory bodies including Malaysia's Shariah Advisory Council, AAOIFI (Accounting and Auditing Organization for Islamic Financial Institutions), and the IFSB (Islamic Financial Services Board) would provide valuable knowledge transfer while accelerating institutional development.

Fourthly, the proposal for a specialized Islamic Banking Pilot Program in strategically selected regions offers a pragmatic approach to market development, concentrating resources and expertise in areas with the highest potential for success before broader national expansion. Tatarstan represents the natural primary pilot region given its existing Islamic finance initiatives, supportive regional government, significant Muslim[14] population, and relatively developed economic base, with estimated market potential for Islamic banking services exceeding $3 billion according to regional economic analysis. Bashkortostan and Dagestan would constitute logical secondary pilot regions, representing different economic profiles and consumer characteristics while maintaining substantial Muslim populations[15].

The pilot program should include preferential licensing procedures for Islamic banking operations within these regions, specialized support services through regional development agencies, targeted incentives for participating financial institutions, and coordinated promotional activities to build market awareness. A structured pilot period of 36-48 months would provide sufficient operational experience to evaluate performance, refine business models, and develop best practices before nationwide expansion, while maintaining sufficient momentum to demonstrate commercial viability. According to implementation studies in other jurisdictions, such regionally focused approaches typically accelerate market development by approximately 40-50% compared to simultaneous nationwide implementation, as they allow more efficient resource allocation, create demonstrable success cases, and develop experienced professional cadres that can subsequently support broader expansion. The pilot approach also allows regulatory refinement based on practical implementation experience rather than theoretical projections, potentially identifying and addressing unforeseen challenges before wider deployment.

Fifthly, the development of a comprehensive Islamic Finance Educational Initiative represents a fundamental proposal addressing the critical knowledge gaps currently limiting market development. This initiative should operate across multiple educational levels and target diverse stakeholder groups including financial

[14] Muslim Population by Country 2025 – World Population Review [Electronic reousrce] // URL: https://worldpopulationreview.com/country-rankings/muslim-population-by-country (accessed: 01.05.2025)

[15] Magomedov R.M. The Development of Islamic Financial Institutions in Muslim Regions of Russia: Challenges and Opportunities // Journal of Regional Studies. 2022. Vol. 17. № 2. P. 87-109.

professionals, regulators, religious authorities, potential customers, and academic institutions. At the professional education level, specialized certification programs should be established in partnership with international Islamic finance educational bodies such as the Chartered Institute of Islamic Finance Professionals (CIIFP) and the Islamic Finance Qualification (IFQ), adapted to include Russia-specific content addressing the local regulatory environment and market characteristics. These programs should be delivered through both traditional educational institutions and digital platforms to maximize accessibility, with financial analysts estimating potential demand for such specialized training at approximately 5,000-7,000 professionals over the initial five-year implementation period[16].

Consumer education represents another critical dimension, requiring development of accessible explanatory materials regarding Islamic financial principles and product structures through both digital platforms and conventional media channels, with particular emphasis on addressing common misconceptions regarding Islamic banking practices. Religious education programs for imams and other community leaders should include modules on modern Islamic financial concepts, enabling them to provide informed guidance to community members regarding the Shariah compliance of available financial products.

Next, an institutional development proposal focuses on the creation of a specialized Islamic Banking Transformation Office within a major Russian bank possessing both the financial resources and strategic motivation to establish leadership in this emerging market segment. Sberbank represents a particularly suitable candidate given its dominant market position, advanced technological capabilities, international connections, and recent strategic interest in Islamic finance development[17]. This transformation office would require specialized staffing combining expertise in Islamic banking structures, product development methodologies, Shariah compliance verification, and the Russian regulatory environment. Initial focus should be placed on developing a comprehensive Islamic banking business model tailored to Russian market conditions, including product prioritization, pricing strategies, distribution approaches, technology requirements, and governance frameworks.

According to implementation timelines observed in other markets, a well-resourced transformation initiative could potentially launch initial Islamic banking products within 12-18 months of commencement, with a full-featured Islamic subsidiary potentially operational within 24-36 months assuming appropriate regulatory accommodations.

The development of an Islamic digital banking platform leveraging existing technological infrastructure but incorporating specialized features for Shariah-compliant products would represent a particularly efficient implementation

[16] What is Islamic Banking? – Tinkoff Journal [Electronic resource] // URL: https://journal.tinkoff.ru/guide/islamskii-banking/#one (accessed: 05.03.2025).

[17] Sberbank began issuing cards and opening accounts according to Sharia norms. – The Moscow Times [Electronic resource] // URL: https://www.moscowtimes.io/2023/10/20/sberbank-nachal-vipuskat-karti-i-otkrivat-scheta-po-normam-shariata-a110639 (accessed: 01.05.2025)

approach, potentially reducing capital requirements by 35-40% compared to traditional branch-based deployment models while accelerating time-to-market and expanding geographical reach. This institutional initiative would benefit from technical assistance partnerships with established Islamic banking institutions such as Malaysia's Maybank Islamic, the United Kingdom's Al Rayan Bank, or Kazakhstan's Al Hilal Bank, which operate in regulatory environments sharing some similarities with the Russian context.

Additionally, the development of a specialized Islamic Banking Technology Framework represents a particularly promising proposal leveraging Russia's substantial financial technology capabilities to overcome certain implementation barriers through innovative approaches. This technology framework should address the specialized requirements of Islamic banking operations including asset-based transaction tracking, profit calculation and distribution systems, Shariah compliance verification mechanisms, and ethical screening tools for investment activities.

The development of standardized APIs (Application Programming Interfaces) for Islamic banking would enable more efficient integration between core banking systems and Shariah-compliant modules, reducing implementation costs while accelerating product deployment capabilities. Digital identity solutions incorporating religious preference parameters could facilitate more targeted marketing of Islamic financial products while streamlining customer onboarding processes. A coordinated technology framework initiative could deliver initial implementations within 8-12 months, providing valuable supporting infrastructure for Islamic banking market development.

Furthermore, a product development proposal outlines a strategic prioritization framework for introducing Islamic financial products aligned with both market demand characteristics and regulatory feasibility within the Russian context. Initial implementation should focus on simpler products facing fewer regulatory complications, including fee-based services structured under the wakalah (agency) principle, debit cards with charity features such as automated zakat (obligatory charity) calculation and distribution, and payment services avoiding interest-bearing float accounts.

As regulatory accommodations expand, priority should shift to asset-based financing products with strong market demand, particularly including home financing through diminishing Musharakah or Ijarah muntahia bittamleek (lease ending in ownership) structures, vehicle financing through Murabaha (cost-plus) arrangements, and business equipment financing through Ijarah (leasing) structures. Market analysis indicates particularly strong demand potential for Islamic home financing in Russia, with an estimated 43% of surveyed Muslims expressing strong preference for Shariah-compliant alternatives to conventional mortgages if available on comparable terms.

An international cooperation proposal recommends the establishment of a Russia-Islamic Finance Strategic Partnership Program formalizing relationships with key Islamic finance jurisdictions and institutions to accelerate knowledge

transfer and potential investment flows. Priority partnership jurisdictions should include:

1. Malaysia, which offers the most comprehensive regulatory framework and market development model potentially adaptable to the Russian context;

2. Kazakhstan, which provides valuable implementation experience in a post-Soviet legal environment similar to Russia's;

3. The United Arab Emirates since existing economic relationships with Russia less constrained by international sanctions.

AAOIFI and the IFSB for standards adaptation and governance frameworks; and the Islamic Development Bank Group for regulatory development, capacity building, and market infrastructure – possibly through a specialized technical assistance program – should form institutional partnerships[18]. Russia can further these partnership talks within current diplomatic frameworks thanks to its observer position in the Organization of Islamic Cooperation.

Finally, the integration of Islamic finance development with Russia's broader economic diversification and international financial strategy represents a final strategic proposal, positioning Islamic banking as a component of the country's response to Western sanctions and evolving global financial architecture. The establishment of Shariah-compliant financing channels could potentially facilitate increased investment and trade flows with Muslim-majority nations less aligned with Western sanctions regimes, creating alternative capital access routes while supporting Russia's geopolitical positioning as a partner to the Islamic world.

According to economic analysis, effectively implemented Islamic finance capabilities could potentially facilitate an additional $5-7 billion in annual trade financing with OIC member states and attract $3-5 billion in direct investment from Islamic investors by 2030[19]. The adaptation of Russia's financial messaging systems to accommodate Islamic banking transaction structures could enhance the country's ability to develop financial channels independent from Western-dominated systems such as SWIFT, aligning with broader strategic objectives regarding financial sovereignty.

The potential establishment of Moscow as an emerging Islamic finance hub for Eastern Europe and Central Asia would complement the country's international financial center ambitions. This strategic integration would elevate Islamic banking development from a primarily domestic religious accommodation to a component of Russia's broader economic and geopolitical positioning, potentially increasing political support and resource allocation.

Conclusion

In conclusion, Islamic banking represents a distinctive financial paradigm whose continued global expansion reflects both religious adherence among Muslim populations and recognition of structural advantages in its asset-backed, risk-

[18] Representatives of the Bank of Russia visited the headquarters of the Islamic Development Bank Group // Bank of Russia [Electronic resource] – URL: https://cbr.ru/press/event/?id=954 (accessed: 01.05.2025)

[19] Islamic Finance Development Report 2023: Navigating Uncertainty. – London Stock Exchange Group [Electronic resource] // URL: https://solutions.lseg.com/IslamicFinance_ICD_LSEG (accessed: 05.03.2025).

sharing approach to financial intermediation. The Russian context presents both significant challenges and opportunities for Islamic banking development, with successful implementation requiring coordinated action across multiple dimensions while potentially yielding substantial benefits for financial inclusion, capital access diversification, and international economic relationships.

The integration of technological innovation with Islamic finance principles offers particularly promising avenues for addressing implementation challenges while potentially enabling more authentic realization of the risk-sharing and ethical objectives foundational to Islamic economic philosophy. As global financial systems continue evolving toward greater diversity and inclusion of alternative models, Islamic banking appears positioned for continued growth and increasing integration with international financial architecture, though implementation paths will necessarily vary based on specific market conditions, regulatory environments, and institutional capabilities across different jurisdictions.

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MECHANISMS FOR IMPROVING THE PROFESSIONAL COMPETENCIES OF VOCATIONAL EDUCATION TEACHERS THROUGH INFORMATION TECHNOLOGIES

Abstract: *The development of professional competencies of vocational education teachers has become a key component in the context of the digitalization of the education system. This article explores the mechanisms for enhancing teaching competencies through the integration of information technologies in vocational education institutions in Uzbekistan. It highlights the necessity for teachers to master digital tools, educational platforms, and innovative pedagogical approaches in order to meet modern educational demands. The study analyzes methods such as professional development programs, digital mentoring, and project-based digital training as effective ways to strengthen professional skills. Special attention is given to the role of institutional support, government strategies, and continuous training in sustaining teachers' growth. The article is based on theoretical analysis and practical observations from ongoing reforms in the national education system. It emphasizes that information technology is not only a means of delivery but also a transformative force in redefining teacher competence in the 21st century.*

Keywords: *vocational education, teacher competencies, digital transformation, information technology, professional development, digital literacy, ICT in education, Uzbekistan, digital pedagogy, educational innovation.*

Introduction

In the era of rapid technological advancement, the education sector, particularly vocational education, is undergoing significant transformation. The integration of information technologies into teaching practices has become an essential requirement for modern educators. In Uzbekistan, where educational reforms are aimed at aligning with global standards, developing the professional competencies of vocational education teachers through digital means is of paramount importance. Educators are expected not only to possess subject-specific knowledge but also to effectively utilize digital platforms, manage online learning environments, and apply ICT-based pedagogical strategies.
The government of Uzbekistan has undertaken strategic initiatives to modernize vocational education through digital infrastructure development, the creation of electronic learning resources, and the implementation of policies aimed at enhancing teachers' ICT skills. These initiatives reflect a broader national agenda that prioritizes the training of competitive professionals capable of thriving in a digital economy.

The urgency of this topic lies in the need to equip vocational education teachers with competencies that go beyond traditional classroom methodologies. Digital transformation demands adaptability, innovation, and continuous learning. Teachers must be able to design and implement interactive digital lessons, assess student performance using digital tools, and personalize instruction to meet diverse learner needs.

This article aims to identify and analyze the mechanisms that support the development of vocational teachers' professional competencies through the use of information technologies. The study draws upon theoretical frameworks in educational technology and practical insights gained from institutional reforms in Uzbekistan. Ultimately, the findings are intended to inform policy decisions and educational practices that promote sustainable teacher development in the digital age.

The improvement of professional competencies in vocational education requires a comprehensive understanding of how information technologies can be systematically integrated into teaching practices. One of the most effective mechanisms is the implementation of continuous professional development (CPD) programs that focus on digital literacy. These programs aim to train teachers to use digital tools, manage online classrooms, and create electronic educational resources. Rather than one-time workshops, CPD initiatives are designed as ongoing learning processes that reflect the dynamic nature of digital tools and platforms. Through these programs, teachers gain practical experience in using learning management systems (LMS), designing multimedia content, and applying methods of formative digital assessment.

Another important mechanism is institutional support. When vocational education institutions prioritize digital development, they provide educators with access to necessary resources, technical support, and time for training. School administrations play a critical role in encouraging teachers to embrace digital teaching. Institutions that establish internal digital leadership teams and peer training groups often experience faster and more sustainable integration of technology. Teachers are more likely to adopt new tools when they see administrative commitment and peer success stories within their own institution.

Furthermore, integrating ICT into teacher evaluation criteria has proven to be an effective motivator. When the ability to use digital tools is included as part of a teacher's formal appraisal or promotion criteria, it leads to a more intentional focus on digital competency development. Schools may implement performance-based digital projects or require a demonstration of ICT-based lessons as part of professional review. Such incentives align personal professional goals with institutional digital transformation objectives.

Mentorship and peer collaboration have emerged as valuable mechanisms for improving digital competencies among vocational education teachers. Digital mentoring programs pair less experienced teachers with colleagues who have already mastered the use of educational technologies. This type of professional relationship fosters a culture of continuous learning and allows teachers to develop

practical skills through observation, guided practice, and reflective feedback. Peer collaboration, including co-teaching and digital lesson planning in teams, encourages mutual support and sharing of best practices. Such cooperative approaches are especially effective in resource-constrained environments, where formal training opportunities may be limited.

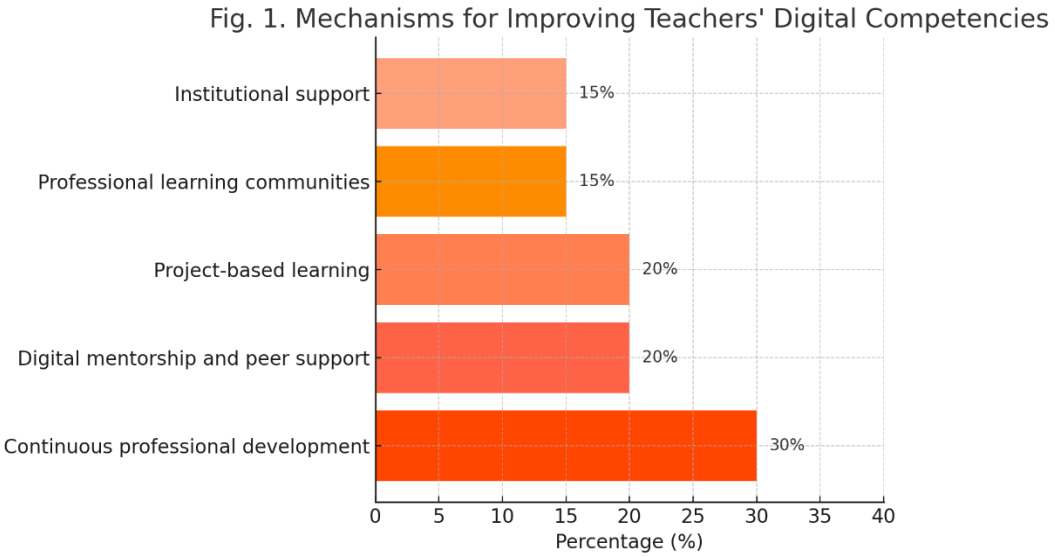

Fig. 1. Mechanisms for Improving Teachers' Digital Competencies in Vocational Education

Project-based learning is another innovative mechanism for developing teachers' digital competencies. When educators engage in projects that require them to create digital teaching materials, such as instructional videos, interactive presentations, or virtual simulations, they not only acquire technical skills but also improve their pedagogical thinking. Project-based tasks are typically oriented toward solving real instructional challenges and integrating technology into specific curricular areas. This ensures that digital tools are not used in isolation but are closely aligned with teaching objectives and student learning outcomes.

National policies and strategic documents in Uzbekistan, including the Digital Uzbekistan 2030 strategy, support the systemic integration of information technologies in education. These policies provide funding and guidelines for schools to implement digital learning environments, including the development of digital content repositories and smart classrooms. Such frameworks serve as an enabling environment that reinforces individual efforts by educators and institutions. They also underscore the importance of aligning teacher training with national development goals and the demands of the modern labor market.

One of the critical components of enhancing vocational education through digital technologies is the personalization of learning for both students and teachers. By mastering digital tools, teachers can adapt content to meet the needs of diverse learners, offering differentiated instruction that takes into account varying levels of ability, interests, and career aspirations. Personalized learning environments,

supported by learning analytics and adaptive platforms, empower educators to track student progress more effectively and to intervene when necessary. This also encourages a shift from teacher-centered to learner-centered instruction, where technology facilitates active participation, collaboration, and self-directed learning.

Another aspect that strengthens digital competence is participation in professional learning communities (PLCs), especially those focused on digital innovation. These communities, both online and in-person, provide platforms for exchanging ideas, evaluating digital teaching tools, and discussing challenges. Teachers who are part of such networks often demonstrate higher levels of engagement and innovation in their classroom practices. In Uzbekistan, the emergence of teacher networks through social media, institutional partnerships, and international cooperation has played a vital role in accelerating the digital transformation of vocational education.

Finally, the sustainability of digital competency development depends on monitoring and evaluation mechanisms. Schools and educational authorities must track the effectiveness of digital training, the extent of technology integration in teaching, and the impact on student learning. Regular assessments, feedback surveys, and digital audits help ensure accountability and identify areas for improvement. These mechanisms also serve as evidence for policymakers to refine educational strategies and allocate resources efficiently. Without such oversight, efforts to digitalize education may remain fragmented and short-lived. Therefore, evaluation is not merely an administrative task but a strategic tool for guiding sustainable transformation.

Conclusion

The advancement of professional competencies among vocational education teachers through information technologies is essential for building a modern, resilient, and competitive education system in Uzbekistan. The integration of digital tools into teaching practice not only enhances instructional quality but also aligns educational outcomes with the demands of the contemporary labor market. This article has examined several key mechanisms—continuous professional development, institutional support, mentorship, project-based learning, and participation in digital communities—that contribute to the sustainable growth of teachers' digital skills.

In the context of ongoing national reforms and global trends in digitalization, these mechanisms must function in coordination. Policymakers, educational institutions, and teachers themselves all have roles in creating an environment that supports digital innovation in pedagogy. Institutional investment, professional incentives, and collaboration platforms are needed to ensure that teachers are equipped to navigate and lead within the digital learning landscape.

Ultimately, improving teachers' digital competencies is not an isolated initiative—it is part of a broader strategy to elevate the quality and relevance of vocational education. With a structured, well-supported approach, the education system in Uzbekistan can fully leverage information technologies to develop skilled

educators and produce a digitally competent workforce prepared for the challenges of the 21st century.

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OPPORTUNITIES FOR FUTURE TEACHERS TO CREATE LEARNING PLATFORMS BASED ON DIGITALLY AUTHENTIC MATERIALS

Annotation. *This article explores the growing potential for future teachers to design learning platforms enriched with digitally authentic materials. It emphasizes how digital tools, real-world media, and online resources can be harnessed to create engaging, student-centered educational environments. The paper highlights the importance of digital competence, the benefits of integrating authentic content, and the development of pedagogical creativity. It also addresses the challenges teacher candidates may face and suggests solutions for effective implementation within teacher education programs.*

Key words*: future teachers, digitally authentic materials, learning platforms, educational technology, digital competence, authentic learning, pedagogical innovation, online tools, real-world media, student engagement*

Introduction. In today's technology-driven world, the role of teachers is evolving beyond traditional instruction. Future educators are expected to become designers of interactive, flexible, and student-centered learning environments. One of the most innovative ways to achieve this is through the use of digitally authentic materials—resources such as online articles, videos, podcasts, infographics, and social media posts that reflect real-life communication and knowledge-sharing. These materials not only make learning more engaging and relevant but also help students develop the digital literacy skills essential for success in the 21st century. As digital natives, future teachers are well-positioned to leverage these resources to build personalized and meaningful learning experiences. This article explores the opportunities and challenges involved in creating such platforms, focusing on the integration of real-world content, the use of digital tools, and the pedagogical growth of pre-service teachers.

In the rapidly evolving educational landscape, future teachers are increasingly expected not only to teach but also to become creators of dynamic, student-centered learning environments. One of the most promising developments in this direction is the use of digitally authentic materials—real-world digital content such as podcasts, videos, blogs, infographics, news articles, and social media posts—to create engaging learning platforms. These platforms enable students to connect classroom learning with the real world, enhance digital literacy, and promote autonomous learning.

Authentic materials are resources not specifically designed for teaching, but used in educational settings to reflect real-life communication. When digitized, these materials bring language and subject learning closer to how information is

consumed in everyday life. For example, English language learners can benefit from TED Talks or YouTube videos to practice listening skills, while science students can analyze real-world climate data from online databases.

By integrating such content, future educators can design lessons that go beyond textbooks and cultivate critical thinking, creativity, and problem-solving. Moreover, students become active participants in their learning process, exploring information in formats they regularly interact with outside the classroom.

With access to digital tools and platforms, today's teacher candidates have unprecedented opportunities to design their own learning environments. Learning management systems (LMS) such as Google Classroom, Moodle, and Edmodo allow them to curate and share authentic digital resources efficiently. Tools like Canva, Padlet, Flip, and Genially help future teachers to create interactive presentations, digital posters, and collaborative tasks based on authentic media.

Additionally, open educational resources (OERs) and Creative Commons licenses offer access to a wide range of modifiable content that can be tailored to specific learning goals. Through this, teachers are not limited to using pre-made materials but can adapt or even co-create digital content with their students.

Developing digital competence and pedagogical skills. Designing learning platforms based on authentic materials also supports the development of digital competence—a crucial 21st-century skill for educators. Future teachers learn to evaluate digital resources critically, ensure ethical usage of online content, and integrate multimedia for inclusive education. At the same time, they develop pedagogical strategies that are responsive to different learning styles and cultural contexts.

By engaging in this creative process, pre-service teachers become more confident in using technology for personalized learning. They also gain experience in planning project-based, interdisciplinary tasks that align with real-world challenges and careers.

While the potential is immense, challenges remain. Some teacher candidates may lack technical skills or face difficulties accessing reliable digital infrastructure. Additionally, designing effective activities around authentic materials requires thoughtful pedagogical planning to avoid cognitive overload or distraction.

To overcome these obstacles, teacher education programs must provide adequate training in digital pedagogy. This includes hands-on workshops, peer collaboration, and mentoring in the use of educational technology. Encouraging reflective practice and innovation will further support the effective integration of digitally authentic content in future classrooms.

Conclusion. In summary, the ability to create learning platforms using digitally authentic materials presents a transformative opportunity for future teachers. It empowers them to make learning more relevant, interactive, and learner-centered. As digital natives, today's teacher candidates are uniquely positioned to harness the power of real-world media to inspire critical thinking, enhance engagement, and prepare students for the demands of the modern world. With the right support and vision, they can become true architects of future-ready education.

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ZAMONAVIY PEDAGOGIK TEXNOLOGIYALARNI O‘QITUVCHILARNI TAYYORLASHDA QO‘LLASH

Annotatsiya *Ushbu maqolada pedagogik texnologiyalar nima ekani, ularning o‘qituvchilarni tayyorlashdagi o‘rni, asosiy turlari va foydali jihatlari haqida ma’lumot berilgan. Shuningdek, pedagogik texnologiyalar yordamida o‘quvchilarda qanday ko‘nikmalar shakllanishi, bo‘lajak o‘qituvchilarni zamonaviy ta’limga tayyorlashda bu texnologiyalarning ahamiyati ko‘rsatilgan.*

Kalit so‘zlar *: Pedagogik texnologiya, o‘qituvchini tayyorlash, interfaol metodlar, axborot texnologiyalari, zamonaviy dars.*

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APPLICATION OF MODERN PEDAGOGICAL TECHNOLOGIES IN TEACHER TRAINING

Annotation*:This article provides information about what pedagogical technologies are, their role in teacher training, their main types, and benefits. It also highlights the skills that can be developed in students through pedagogical technologies and the importance of these technologies in preparing future teachers for modern education.*

Keywords*: Pedagogical technology, teacher training, interactive methods, information technologies, modern lesson.*

Pedagogik texnologiyalar zamonaviy o‘quv jarayonining muhim tarkibiy qismi bo‘lib, ta'lim maqsadlariga erishishda muhim rol o‘ynaydi. Ular o‘qituvchilar va o‘quvchilarga kerakli natijaga erishishda yordam beradigan turli xil o‘qitish usullari, yondashuvlari va vositalarini ifodalaydi. Pedagogik texnologiyalarning samaradorligini baholash bu ularning samaradorligini va kelajakda ulardan foydalanishni aniqlashda katta ahamiyatga ega. Ma’lumki, zamonaviy texnologiyalar, amaliyotga joriy etish mumkin bo‘lgan ma’lum pedagogik tizimning loyihasidir.

Pedagogik tizim o‘zaro bog‘liq bo‘lgan vositalar, usullar va jarayonlar yig‘indisi bo‘lib, shaxsdagi muayyan sifatlarni shakllantirishga ta’sir etishni maqsadga muvofiq tarzda amalga oshiradi.

Pedagogik texnologiyalarning vazifalari - o‘qituvchilarni zamonaviy texnologiyalarning mohiyatidan xabardor qilish hamda ularni maxsus fanlar asoslarini o‘qitishga yo‘naltirilgan mashg‘ulotlar jarayonini noan’anaviy shakllarda

tashkil etishga, ta’lim jarayonini mukammal modul asosida loyihalashga erishish, ta’lim jarayonini loyihalash texnologiyasidan oqilona foydalana olish ko‘nikma va malakalariga ega bo‘lishga, ta’lim oluvchilar tomonidan nazariy bilimlarning puxta, chuqur o‘zlashtirilishi va ularda amaliy ko‘nikma va malakalar hosil bo‘lishining kafolati bo‘la olishga o‘rgatishdan iborat.[1]

Bugungi kunda ta’lim sohasida yangiliklar tez sur’atlar bilan rivojlanmoqda. Ayniqsa, pedagogik texnologiyalarni o‘qitish, jarayoniga joriy etish muhim ahamiyat kasb etmoqda. Kelajakdagi o‘qituvchilarni zamonaviy talablarga javob beradigan tarzda tayyorlashda pedagogik texnologiyalar katta rol o‘ynaydi.

Pedagogik texnologiya - bu o‘quv jarayonini rejalashtirish, tashkil etish va nazorat etishning ilmiy asoslangan tizimidir. Unda o‘qituvchining harakatlari, o‘quvchining faolligi va ta’lim vositalarining bir-biriga uyg‘unligi muhim hisoblanadi. Pedagogik texnologiyalar yordamida o‘qituvchi darsni samarali rejalashtiradi.

Zamonaviy o‘quv metodlarini tanlaydi va o‘quvchining faol ishtirokini ta’minlaydi. Bu esa kelajakdagi o‘qituvchilarning kasbiy malakasini oshirishga xizmat qiladi. Shuningdek, bu texnologiyalar yordamida o‘quvchi markaziga yo‘naltirilgan, ochiq vat eng imkoniyatli ta’lim muhitini yaratish mumkin. Bu esa o‘z navbatida zamonaviy, raqobatdosh o‘qituvchilarni yetishtirishga xizmat qiladi. O‘qituvchilar tomonidan ta’lim jarayonida zamonaviy ta’lim texnologiyalaridan foydalanish samaradorligini baholash quyidagi mezonlar bo‘yicha amalga oshiriladi:

1. Zamonaviy ta'lim texnologiyalari va usullarini bilish darajasi.
2. Zamonaviy ta'lim texnologiyalaridan foydalanish samaradorligi.
3. Zamonaviy ta'lim texnologiyalarini qo'llash orqali ta'lim s ifatini oshirishi. [3]

Ta’lim jarayonidagi pedagogik texnologiyalar - bu jarayonini samarali va sifatli amalga oshirishga yordam beradigan ilmiy asoslangan vositalar, usullar, va texnikalar tizimi hisoblanadi. Ularning asosiy maqsadi o‘quvchilarning bilimlarini chuqurlashtirish, ularni mustahkamlash va ilg‘or texnologiyalardan foydalanish orqali ta’limni samarali tashkil etishdir.

Pedagogik texnologiyalarning asosiy xususiyatlaridan biri o‘quvchilarning faol ishtirokini taminlashdir. Ular o‘quvchilarning faolligini oshiradi va o‘z navbatida, o‘quvchilarni o‘qitish jarayoniga yanada ko‘proq jalb qilishga yordam beradi. Interaktiv vositalar yordamida esa o‘quvchilar o‘z fikrlarini bildiradilar, guruhlarda ishlaydilar va real muammolarni hal qiladilar.

Tarbiyaviy faoliyatda innovatsion pedagogik texnologiyalarni sinchkovlik bilan joriy etish muhimdir. Vatanparvarlik tarbiyasi tarixiy ekskursiyalar va milliy bayramlarga bag‘ishlangan tadbirlarni tashkil etish. Axloqiy tarbiya ro‘lli o‘yinlar orqali o‘zaro hurmat, do‘stlik va axloqiy fazilatlarni targ‘ib qilish. Ijtimoiy tarbiya loyihalar orqali ijtimoiy mas'uliyatni shakllantirish natijalar va afzalliklar. Ta’lim va tarbiya jarayonining barcha bosqichlarida yuqori natijalarga erishiladi.

Ta’lim – tarbiya jarayoniga tarbiyaviy texnologiyalarni qo‘llashning asosiy maqsadi shaxsni shakllantirish bundan tashqari tarbiyaviy texnologiyalar

o‘quvchilarda axloqiy va ma’naviy qadriyatlarni shakllantirish o‘zini hurmat qilish, vatanparvarlikni rivojlantirish , ijtimoiy faollikni oshirish kabi muhimjihatlarni rivojlantiradi.

Pedagogik texnologiyalarni o‘qituvchilarni tayyorlashda qo‘llash ta’lim sifatini oshirishga xizmat qiladi. O‘quvchilarda chuqur bilim, mustaqil fikrlash va zomonaviy metodlardan foydalanish ko‘nikmalari shakllanadi. Natijada ular kelajakda o‘z fanini yaxshi biladigan, zamonaviy fikrlaydigan o‘qituvchilar bo‘lib yetishadi. Zamonaviy ta’lim tizimi doimiy ravishda yangilanib bormoqda. Bu yangiliklar, ayniqsa, o‘qituvchilarni tayyorlashda o‘z aksini topmoqda. Chunki bugungi o‘quvchi ilg‘or texnologiyalar bilan ishlashni istaydi. O‘qituvchidan esa yangi metodlar, zamonaviy fikr va innovotsion yondashuvlar talab qilinadi. Shuning uchun o‘qituvchilarni tayyorlash jarayonida pedagogic texnologiyalardan foydalanish zarur.

Pedagogik texnologiyalarning asosiy vazifalari

- O‘qitish sifatini oshirish.
- O‘quvchini markazga qo‘ygan darslarni tashkil etish.
- O‘rganishni qulay, tushunarli va faol qilish.
- Ta’lim natijalarini aniq baholash.
- Zamonaviy vosita va uslublardan foydalanishni o‘rganish. [4]

Bularning natijasida o‘qituvchi har bir darslarni zamon talablariga mos ravishda va o‘quvchilarning salohuyatlarini to‘g‘ri va aniq baholash asosida olib boradi.

Mazkur texnologiyalardan to‘g‘ri foydalanish zamonaviy ta’lim va tarbiya talablariga mos rivojlangan avlodni tarbiyalashga xizmat qiladi. Biz anashunday milliy tarbiyani ma’naviyatni har tomonlama yuksaltirish masalasini o‘z oldimizga yuksak vazifa qilib qo‘yar ekanmiz, bugungi kunda ma’naviyatimizni rivojlantiradigan va unga ta’sir o‘tkazadigan barcha omil va mezonlarni chuqur tahlil qilish orqali biz ularni, qanday o‘rin tutishini yaxshi anglab olishimiz maqsadga muvofiqdir.

Bunday texnologiyalarning interfaol, multimediya va moslashtirilgan o‘qitish usullarini o‘z ichiga olgan xususiyatlari o‘quvchilarga eng samarali o‘quv tajribasini taqdim etadi. Bu texnologiyalar pedagogik yondashuvlarni o‘zgartirish, o‘quvchilarni ta’lim jarayoniga faol jalb qilish va ularning mustaqil fikrlash ko‘nikmalarini rivojlantirish imkoniyatini yaratadi.

Ta’lim sohasida samaradorlik va sifatni oshirish har doim dolzarb ahamiyatga ega bo‘lgan mavzulardan biridir. Zamonaviy jamiyatda bilim olish jarayoni nafaqat ma’lumotlarni o‘zlashtirish, balki o‘quvchilarning fikrlash qobiliyatini rivojlantirish, ijodkorlikni rag'batlantirish va amaliy ko‘nikmalarni shakllantirishga yo‘naltirilgan bo‘lishi lozim.

Ushbu jarayonda pedagogik texnologiyalar o‘ta muhim rol o‘ynaydi. Aynan pedagogik texnologiyalar o‘qitish jarayonlarini innovatsion yondashuvlar yordamida yangilash, ta’lim sifatini yanada oshirish imkonini beradi. Ta’lim jarayonini takomillashtirish, o‘qituvchilarning tajribasini oshirish va

o‘quvchilarning motivatsiyasini ko‘tarish bilan birga, ularning shaxs sifatida rivojlanishiga yordam beradigan integratsiyalashgan metodlar talab etiladi[3].

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TEXNIK OLIY TA’LIMDA TA’LIM TEXNOLOGIYALARINING FUNKSIONAL KLASSIFIKATSIYASI VA ULARNING PEDAGOGIK SAMARADORLIGI

Annotatsiya: *Ushbu maqolada texnik oliy ta’lim muassasalarida qo‘llaniladigan ta’lim texnologiyalari funksional jihatdan tasniflanadi va ularning pedagogik samaradorligi tahlil qilinadi. Axborot yetkazish, interaktivlik, amaliy mashg‘ulotlar, baholash, refleksiya va motivatsiya funksiyalariga ega texnologiyalar misolida zamonaviy ta’lim vositalarining afzalliklari ko‘rsatilib, ular TPACK va SAMR modellari asosida baholanadi.*

Kalit so‘zlar: *ta’lim texnologiyasi, funksional klassifikatsiya, texnik ta’lim, virtual laboratoriya, interaktiv ta’lim, gamifikatsiya, TPACK, SAMR, raqamli ta'lim.*

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FUNCTIONAL CLASSIFICATION OF EDUCATIONAL TECHNOLOGIES IN TECHNICAL HIGHER EDUCATION AND THEIR PEDAGOGICAL APPLICATION EFFICIENCY

Annotation: *This article functionally classifies educational technologies used in technical higher education institutions and analyzes their pedagogical effectiveness. The advantages of modern educational tools are shown on the example of technologies with the functions of information delivery, interactivity, practical training, assessment, reflection and motivation, and they are evaluated based on the TPACK and SAMR models.*

Keywords: *educational technology, functional classification, technical education, virtual laboratory, interactive learning, gamification, TPACK, SAMR, digital learning*

Kirish. Texnik oliy ta’lim (muhandislik, tabiiy fanlar, texnologiya) sohalarida ta’lim jarayonini samarali tashkil etishni qo‘llab-quvvatlash uchun keng turdagi ta’lim texnologiyalari paydo bo‘lgan. Ushbu texnologiyalarni funksional jihatdan tasniflash — ularning ta’lim jarayonida bajaradigan pedagogik funksiyalariga qarab guruhlashni anglatadi. Masalan, ba’zi texnologiyalar axborot yetkazishga (masalan, LMS tizimlari, raqamli darsliklar, yozib olingan videodarslar), boshqalari esa o‘zaro

muloqot va hamkorlikka (masalan, forumlar, jonli videokonferensiyalar, ijtimoiy o‘quv platformalari), ko‘nikmalarni shakllantirishga (masalan, virtual laboratoriyalar, simulyatsiyalar, kod yozish muhiti), baholashga (masalan, onlayn testlar, e-portfellar, avtomatik baholash tizimlari), refleksiyaga (masalan, o‘quv kundaliklari, raqamli portfellar) va motivatsiyaga (masalan, gamifikatsiyalashgan platformalar, AR/VR tajribalari) yo‘naltirilgan bo‘ladi.

Ushbu maqolada aynan ana shu funksional tasnif asos qilib olinib, bu turdagi vositalarning o‘quv jarayoniga ta’siri haqidagi ilmiy tadqiqotlar tahlil qilinadi. Ta’lim texnologiyalarini samarali integratsiyalash uchun zamonaviy pedagogik yondashuvlardan foydalanish talab etiladi. Masalan, TPACK modeli o‘qituvchilarga texnologiyani fan mazmuni va didaktik yondashuv bilan uyg‘unlashtirishni tavsiya etsa, SAMR modeli texnologiyalarning qo‘llanish bosqichlarini oddiy almashtirishdan (Substitution) tortib ta’limni transformatsiya qilishgacha (Redefinition) baholaydi.

Maqolada har bir funksional toifadagi texnologiyalarga misollar orqali (masalan, Moodle/Campus LMS, muhandislik simulyatorlari, AR/VR laboratoriyalari, loyiha asosidagi platformalar, gamifikatsiya tizimlari) tahliliy yondashuv bilan baho beriladi va ular an’anaviy metodlar bilan solishtiriladi. Shu bilan birga, UNESCOning AKT kompetensiya modeli kabi xalqaro normativ hujjatlar ham ta’lim texnologiyalarining o‘quv dasturlariga integratsiyasi va o‘qituvchi tayyorlash bilan uyg‘un bo‘lishi kerakligini ta’kidlaydi.

Umuman olganda, bu maqola texnik oliy ta’lim muassasalarida ta’lim texnologiyalarining talaba faolligi, o‘zlashtirish darajasi, amaliy ko‘nikmalarni rivojlantirish va mustaqil o‘rganishga ta’sirini yoritadi.

Funksional toifalarni aniqlash. Ta’lim texnologiyalari ko‘pincha ular bajaradigan funksiyalar asosida guruhlanadi. Asosiy pedagogik funksiyalar quyidagilardan iborat:

- Axborot yetkazish: masalan, LMS tizimidagi modul kontentlar, multimedia darslar, podkastlar.
- O‘zaro muloqot va hamkorlik: masalan, chat va forum vositalari, virtual sinflar, birgalikdagi hujjatlar.
- Amaliy mashq va ko‘nikma hosil qilish: masalan, virtual laboratoriyalar, interaktiv simulyatsiyalar, dasturlash muhiti.
- Baholash: masalan, onlayn testlar, o‘zaro va o‘z-o‘zini baholash vositalari, elektron portfellar.
- Refleksiya: masalan, raqamli kundaliklar, maqsad qo‘yish va metakognitsiyani rag‘batlantiruvchi portfellar.
- Motivatsiya va jalb etish: masalan, belgi va ball asosidagi gamifikatsiya platformalari, AR/VR immersive tajribalari.

Bu toifalar ta’lim texnologiyalarining barcha asosiy imkoniyatlarini qamrab oladi. Masalan, onlayn baholash vositalari tezkor fikr bildirish va moslashuvchanlikni ta’minlab, o‘quv jarayonini kuchaytiradi. Simulyatsiyalar esa amaliy ko‘nikmalarni xavfsiz muhitda shakllantirish imkonini beradi.

Texnik oliy ta’lim muassasalarida aynan amaliy mashg‘ulotlar muhim rol o‘ynaydi. Shu sababli simulyatsiyalar va interaktiv laboratoriyalar bu kontekstdagi o‘qitishda alohida ahamiyat kasb etadi.

Ta’lim texnologiyalarini samarali integratsiyalashda ikki asosiy pedagogik model muhim ahamiyatga ega. TPACK (Texnologik-Pedagogik-Fan Mazmuni Bilimi) modeli ta’limda texnologiyadan samarali foydalanish uchun o‘qituvchi mazmun, pedagogika va texnologiya o‘rtasidagi o‘zaro bog‘liqlikni chuqur anglashini talab qiladi. SAMR modeli (Substitution – Almashtirish, Augmentation – Kengaytirish, Modification – O‘zgartirish, Redefinition – Qaytadan talqin qilish) esa o‘qituvchilarga texnologiyani oddiy almashtirish vositasi sifatida emas, balki ta’lim topshiriqlarini tubdan o‘zgartiruvchi vosita sifatida ishlatishni tavsiya etadi. Masalan, laboratoriya simulyatsiyasi (Substitution yoki Augmentation bosqichida) real tajribaning raqamli shaklini yaratadi, holbuki virtual reallik (VR) orqali amalga oshirilgan tajriba (Redefinition) haqiqiy laboratoriyada imkonsiz bo‘lgan o‘quv faoliyatini tashkil etishga imkon beradi.

Yaxshi amaliyot bo‘yicha xalqaro tavsiyalar, masalan, UNESCOning AKT kompetensiyalari bo‘yicha modeli, bu yondashuvlarni qo‘llab-quvvatlab, texnologiyani o‘quv dasturi va o‘qituvchi malakasiga moslashtirishni taqozo etadi.

So‘nggi tahlillar shuni ko‘rsatmoqdaki, texnik ta’lim sohasida immersiv (chuqur jalb qiluvchi) va adaptiv texnologiyalar jadal rivojlanmoqda. Virtual va kengaytirilgan reallik (VR/AR) texnologiyalari STEM ta’limi uchun tobora ko‘proq o‘rganilmoqda, chunki ular vizuallashtirish, interaktivlik va motivatsiyani kuchaytirishga xizmat qiladi. Gamifikatsiya – o‘yin elementlari (ballar, nishonlar, chaqiriqlar)ni o‘quv faoliyatiga tatbiq etish – talabalar ishtirokini va amaliy ko‘nikmalarni oshirishga yordam beradi, garchi bu ta’sir individual xususiyatlarga qarab o‘zgarishi mumkin.

Bundan tashqari, o‘quv tahlili (learning analytics) va sun’iy intellektga asoslangan virtual o‘qituvchilar ham rivojlanmoqda, lekin ular bu maqolaning asosiy funksional toifalariga kirmaydi.

Avvalgi tadqiqotlar shuni ko‘rsatadiki, aralash (blended) va onlayn o‘qitish an’anaviy darslarga nisbatan teng yoki undan yuqori samaradorlikka ega bo‘lishi mumkin. Meta-tahlil natijalariga ko‘ra, aralash kurslar (ya’ni onlayn va an’anaviy darslarning kombinatsiyasi) **faqat an’anaviy darslarga nisbatan sezilarli darajada yuqori o‘quv natijalari ($g \approx +0.35$)**ni ta’minlagan. To‘liq onlayn darslar esa yuzma-yuz o‘qitish bilan taxminan bir xil samaradorlikni ko‘rsatgan.

Shu bilan birga, onlayn o‘qitishda talabalar faolligi ko‘pincha kurs dizayniga bog‘liq: interaktiv elementlar, o‘qituvchining faol ishtiroki va muntazam fikr-mulohaza mexanizmlari — bularning barchasi talabaning uzilishining oldini olishda muhimdir.

Adabiyotlar shuni ko‘rsatadiki, ta’lim texnologiyalarining har bir funksional toifasi muayyan pedagogik imkoniyatlarni taklif etadi: o‘quv mazmunini moslashuvchan yetkazish, chuqurroq interaktivlik, xavfsiz amaliy tajriba, tezkor fikr-mulohaza, o‘z-o‘zini tahlil qilish hamda o‘yin orqali jalb etish. Ularning aniq

ta’siri esa texnologiyalarni qanchalik pedagogik jihatdan mos va infratuzilmaviy jihatdan qo‘llab-quvvatlangan holda integratsiyalashganiga bog‘liq.

1. Axborot yetkazish texnologiyalari. Ushbu texnologiyalar o‘quv kontenti va ma’ruzalarni raqamli formatda yetkazadi. LMS platformalari (masalan, Moodle yoki Canvas) texnik universitetlarda keng tarqalgan bo‘lib, o‘quv materiallari, videodarslar, o‘quv rejalarini markazlashgan shaklda boshqaradi. Raqamli darsliklar va yozib olingan darslar o‘qituvchisiz mustaqil o‘rganish imkonini kengaytiradi.

Tadqiqotlar natijalari turlicha: onlayn o‘qitish moslashuvchanlikni oshiradi va talabalarga o‘ziga qulay sur’atda o‘rganishga imkon beradi (ko‘pincha natijalarni yaxshilaydi), lekin samaradorlik ko‘p jihatdan kurs dizayniga bog‘liq. Sistematik tahlillar interaktiv elementlar kiritilgan onlayn yoki aralash o‘qitish natijalarni sezilarli darajada yaxshilashini ko‘rsatadi.

Amaliyotda LMS tizimining samarali qo‘llanilishi (masalan, viktorinalar, multimedia, forumlar bilan boyitilgan kurslar) talabalarning o‘zlashtirishi va ishtirokini yaxshilaydi. Biroq, ba’zi tadqiqotlar shuni ko‘rsatadiki, faqat kontent joylashtirishning o‘zi etarli emas – texnik qo‘llab-quvvatlash yoki foydalanuvchi tayyorligining yo‘qligi foydani kamaytiradi. Masalan, ayrim talabalar tarmoq nosozligi yoki LMS ishlashini bilmaslik sababli samaradorlik past bo‘lganini bildirgan.

An’anaviy va zamonaviy usullar taqqoslanishi: An’anaviy ma’ruzalar va bosma darsliklardan farqli o‘laroq, raqamli texnologiyalar orqali ma’lumotga keng va adolatli kirish ta’minlanadi (talaba kerakli vaqtda o‘rganadi). Meta-tahlillar shuni ko‘rsatadiki, aralash ta’lim shakllari faqat an’anaviy darslarga qaraganda yuqori natijalarni beradi. Muvaffaqiyat kaliti esa – interaktivlik bilan boyitilgan kontentdir: masalan, videolarga testlar kiritilishi oddiy tomosha qilishdan samaraliroq; modul bo‘lib bo‘lingan onlayn darslar esa takrorlash imkonini beradi.

2. O‘zaro muloqot va hamkorlik vositalari. Ushbu toifaga videokonferensiyalar, guruhli chatlar, forumlar kabi aloqa vositalari, hamda umumiy hujjatlar, vikilar, bulutli laboratoriyalar kabi hamkorlik muhiti kiradi. Texnik ta’lim dasturlarida bunday vositalar, ayniqsa, loyiha asosida ishlaydigan guruhlar uchun foydalidir. Masalan, GitHub dasturlash loyihalari uchun, Slack esa muhandislik kurslarida jamoaviy ishlash uchun keng qo‘llaniladi.

Ilmiy adabiyotlarda interaktiv muloqot va tengdoshlar bilan o‘rganish o‘quvchilar faolligini oshirishda muhim omil sifatida e’tirof etilgan. Masalan, o‘qituvchi tomonidan moderatsiya qilinadigan forumlar onlayn STEM kurslarida talabalarni izolyatsiyadan saqlashda yordam beradi. Shuningdek, mobil qurilmalar va ilovalar (interaktiv so‘rovlar, real vaqtdagi savol-javob) hatto katta auditoriyalarda ham faol ishtirokni ta’minlaydi.

Pedagogik samaradorlik: Zoom yoki Teams kabi sinxron aloqa vositalari real dars muhitini simulyatsiya qilishi mumkin, ayni paytda forumlar kabi asinxron vositalar tortinchoq talabalarni ham faollikka jalb etadi. Yuqori ta’limdagi tadqiqotlar bunday vositalardan samarali foydalanilganda talabalar mamnunligi va ishtirokining oshishini ko‘rsatgan. Biroq, aynan texnik sohalarda bu vositalarning

samaradorligi bo‘yicha miqdoriy ma’lumotlar cheklangan. Umumiy adabiyotlar shuni bildiradiki, talaba-talaba va talaba-o‘qituvchi o‘rtasidagi aloqaning kuchayishi motivatsiya va ishonchni oshiradi.

Taqqoslash: An’anaviy darslar ko‘proq yuzma-yuz muloqotga va qog‘ozda bajariladigan guruh ishlariga tayanadi, zamonaviy texnologiyalar esa global hamkorlikni va real vaqtdagi fikr almashinuvini ta’minlaydi. Masalan, turli universitetlardagi muhandislik talabalari bir vaqtda CAD fayllarni bulutda birgalikda tahrir qilishi mumkin — bu imkoniyat an’anaviy usullarda mavjud emas. Biroq, faqat matnli chatga suyanish noverbal signal yo‘qligi sababli cheklovlarga olib keladi, shuning uchun aralash yondashuvlar afzal ko‘riladi.

Texnik ta’lim, odatda, amaliy ko‘nikmalarni egallashni talab qiladi. Virtual laboratoriyalar va simulyatorlar (elektr zanjirlari, mexanik tizimlar, kimyoviy jarayonlar va boshqalar uchun) talabalar uchun qimmat fizik jihozlarsiz xavfsiz va takroriy eksperimentlar o‘tkazishga imkon beradi. 2024-yilda muhandislik yo‘nalishidagi virtual laboratoriyalar bo‘yicha o‘tkazilgan meta-tahlil ularning ta’lim samaradorligiga ijobiy ta’sir ko‘rsatganini ko‘rsatdi (Hedges’ g ≈ 0.686). Ayniqsa, virtual laboratoriyalar talabalar motivatsiyasi va faolligini sezilarli darajada oshirgan (ta’sir kuchi g ≈ 2.9–3.6). Tadqiqotchilarning ta’kidlashicha, virtual laboratoriyalar real laboratoriyalarni to‘liq almashtira olmasa-da, ular talabalar qiziqishini uyg‘otadi va jihozlar yetishmasligi kabi cheklovlarni bartaraf etadi. Onlayn simulyatorlar (masalan, elektr zanjiri simulyatorlari, parvoz simulyatorlari, kimyoviy reaksiyalar ilovalari) ham talabalar uchun amaliy mashg‘ulotlarni bajarish imkonini beradi.

Dasturlash va dizayn muhiti: Kompyuter fanlari va tegishli yo‘nalishlarda onlayn dasturlash maydonchalari (Repl.it, CodeOcean) hamda CAD/EDA vositalari talabalar uchun istalgan joyda dasturlash yoki dizayn bilan shug‘ullanish imkonini yaratadi. Bu platformalar odatda avtomatlashtirilgan test va fikr bildirish tizimiga ega bo‘lib, mustaqil o‘rganishni qo‘llab-quvvatlaydi. GitHub, Jupyter Notebooks kabi loyiha asosidagi platformalar jamoaviy ish va versiyalarni boshqarish ko‘nikmalarini rivojlantirishga xizmat qiladi. Aniq natijalar cheklangan bo‘lsa-da, o‘qituvchilar bunday vositalar yordamida shug‘ullangan talabalar ko‘proq amaliy tayyorgarlik darajasiga ega bo‘lishini ta’kidlaydi.

Pedagogik ta’sir: Virtual laboratoriyalar bo‘yicha kuchli ta’sir ko‘rsatkichlari (effekt o‘lchami) shuni ko‘rsatadiki, interaktiv amaliyot vositalari STEM ta’limida juda samaralidir. Ular “amaliyot orqali o‘rganish”ni rag‘batlantiradi — bu esa ko‘nikmalarni shakllantirishda muhim omil hisoblanadi. Masalan, ko‘prik dizayni simulyatori orqali muhandislik talabasi qisqa muddatli laboratoriya mashg‘ulotida sinab bo‘lmaydigan gipotezalarni tekshirishi mumkin. Bu vositalar takroriy eksperimentlar qilishga imkon beradi — talabalar xatolardan xavfsiz tarzda tez o‘rganadilar. Meta-tahlillar an’anaviy laboratoriyalarga nisbatan bunday texnologiyalar orqali o‘zlashtirish darajasi yuqoriroq bo‘lishini ko‘rsatadi, ayniqsa talabalar faol qatnashgan taqdirda. Umuman olganda, bu texnologiyalar murakkab tizimlarni anglash va muammoli vaziyatlarni hal qilish qobiliyatini rivojlantiradi.

Texnik oliy ta’lim tizimida ta’lim texnologiyalarini funksional jihatdan tasniflash ularni pedagogik maqsadlarga muvofiq holda tanlash va samarali qo‘llash imkonini beradi. Ushbu maqolada o‘rganilganidek, axborot yetkazish, interaktivlikni ta’minlash, amaliy ko‘nikmalarni rivojlantirish, baholash, refleksiya va motivatsiya kabi funksiyalar asosida texnologiyalarni tizimli yondashuv orqali tasniflash, o‘qituvchilarga dars jarayonini chuqur o‘ylangan tarzda loyihalashga yordam beradi.

Tahlillar shuni ko‘rsatadiki, zamonaviy raqamli vositalar — jumladan, LMS tizimlari, simulyatorlar, AR/VR laboratoriyalari, gamifikatsiya platformalari, onlayn baholash tizimlari va elektron portfellar — talabalar bilimini mustahkamlash, ularni o‘quv jarayoniga jalb qilish, amaliy va metakognitiv ko‘nikmalarini rivojlantirishda an’anaviy usullarga nisbatan yuqori samaradorlikka ega. Ayniqsa, virtual laboratoriyalar va gamifikatsiyalashgan o‘quv muhiti talabalar motivatsiyasini oshirish va mustaqil o‘rganishga bo‘lgan qiziqishni kuchaytirishda muhim rol o‘ynaydi.

Shuni alohida ta’kidlash lozimki, ta’lim texnologiyalarining samaradorligi ularni TPACK modeli asosida — mazmun, pedagogika va texnologiya o‘zaro bog‘liqligida — hamda SAMR modeli asosida — oddiy almashtirishdan innovatsion qayta talqinga qadar — moslashtirish darajasiga bevosita bog‘liq. Bundan tashqari, UNESCOning AKT kompetensiya modeli doirasida o‘qituvchilarning raqamli savodxonligini rivojlantirish va texnologik vositalardan maqsadli foydalanish bo‘yicha doimiy tayyorgarlik zarurligi e’tirof etildi.

Umuman olganda, texnologiyalarning pedagogik funksiyalari asosida tasniflanishi texnik oliy ta’limda ta’lim sifati va samaradorligini oshirish, shuningdek, talabalar kompetensiyasini chuqur va barqaror shakllantirishga xizmat qiladi.

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INCREASING THE EFFICIENCY OF AUTOMOTIVES THROUGH RECONSTRUCTION OF AUTOMOTIVE TRANSPORT ENTERPRISES

Abstract. *This article considers ways to increase the efficiency of road transport by reconstructing them based on an analysis of the technical and operational condition of motor transport enterprises in the Republic of Uzbekistan. The issues of equipping the technical service and current repair system with modern technologies, increasing environmental safety, reducing fuel consumption and extending the service life of cars are analyzed. The practical recommendations presented in the article are aimed at optimizing the diagnostics, washing, cleaning and repair systems of cars.*

Key words: *motor transport enterprises, reconstruction, technical maintenance, efficiency, diagnostics, technology.*

Introduction. Currently, road transport is gaining importance as an integral part of the economic system. Population growth, expansion of industry and trade, and increased demand for transport are leading to an increase in the number of cars. At the same time, the technical condition of transport enterprises, service infrastructure and management systems are not always ready for these changes. Most of the existing road transport enterprises in our country are not equipped with modern technical equipment, and their production bases do not meet modern technological requirements. This negatively affects the efficiency of vehicles.

Research methodology According to the analysis, currently more than 40% of trucks in Uzbekistan have a service life of more than 10 years.

The fact that most of the existing vehicles do not receive timely and full technical maintenance, outdated spare parts and ineffective diagnostic systems leads to the following reasons:

-Increased fuel consumption (up to 10–15%);

-Decreased reliability (an average of 2.3 failures per 10,000 km);

-Excess of harmful gases emitted into the environment, in particular, by 1.5–2 times.

In terms of reconstruction directions and technical solutions, it is advisable to carry out the reconstruction of motor transport enterprises through re-equipment in the following areas:

Upgrading of technical service (TS) workshops:

Computerized diagnostic stands (OBD-II, 3D Scanner)

Accurate and quick detection of malfunctions, reducing the risk of improper repairs.

Increases work efficiency by 25%.

Hydraulic lifting lifts

Increases the safety and speed of repair work, allows for the effective use of labor.

Figure 1. Computerized diagnostic stands OBD-II

Modernization of washing and cleaning systems:

Tunnel-type automated washing systems

Allows cleaning of 8–10 trucks per hour.

Water savings: 30–40%

Workforce: 1 person instead of 2

Contactless washing technology

Does not damage varnish and paint surfaces, environmentally friendly.

Water recycling systems

Allows 70% of water to be reused in each washing cycle.

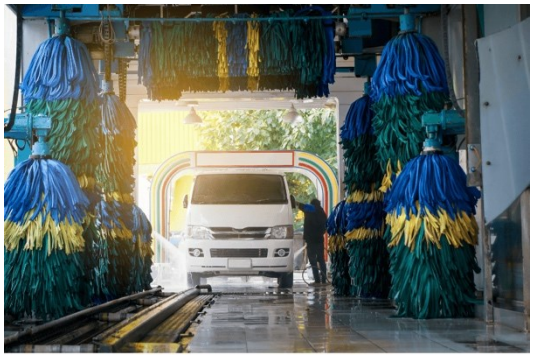

Figure 2. Tunnel-type automated washing systems

Equipment for repair shops:

Lathes (CNC type)

Precisely prepare various metal parts, reduce procurement costs.

Hydraulic presses and welding machines

Improve the quality of mechanical repair work.

Figure 3. Lathes (CNC type)

Recommendations:

- It is necessary to organize the T&C workshop for each motor transport enterprise as a minimized automated complex;
- Financing of technologies to be reconstructed through investment programs by the state and private sector;
- Encouraging local manufacturers to produce modern equipment;
- Digitalization of T&C processes and introduction of monitoring platforms.

CONCLUSION.

Reconstruction of motor transport enterprises will increase the technical efficiency, environmental safety, service life and economic efficiency of vehicles. This process is theoretically based, proven by practical examples, and is considered an important promising direction for implementation in the conditions of Uzbekistan.

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SUBJECTS OF FINANCIAL MARKETS AND THE ORGANIZATION OF ACCOUNTING WITHIN THEM

Abstract: *The article discusses financial markets, particularly the organization of accounting in commercial banks and relevant regulatory documents. Using the example of the joint-stock commercial bank "Hamkorbank", the article analyzes how properly maintained accounting leads to positive outcomes as reflected in the bank's key financial indicators. The article concludes with final remarks.*

Key words: *financial markets, commercial banks, regulatory documents, accounting, Hamkorbank.*

In the context of worldwide integration, rapid digital advancement, and intensified capital flows, financial markets are playing an increasingly important role in the economy. Financial markets are especially recognized as a key tool for mobilizing financial resources, directing them to priority sectors of the economy, attracting investments, and financially supporting promising projects. Historically, financial markets have been an integral part of the economic system, and they have expanded further with the development of industrialization and capitalism. Their existence and development ensure economic freedom and the efficient allocation of resources. Structurally, financial markets consist of the following segments: The currency market facilitates trading in national and foreign currencies; The credit market serves to attract short-term and long-term borrowed funds; The securities market relates to the circulation of shares, bonds, and other financial instruments; Commercial banks — provide credit, currency exchange, and deposit services; The insurance market — offers services aimed at reducing financial risks and providing guarantees against them.

Financial markets play a unique intermediary role in the modern economy. Financial institutions such as banks, investment funds, insurance companies, and brokerage firms actively participate in this process. Commercial banks are considered an essential part of financial markets. They perform key functions such as organizing capital flows and allocating them efficiently, maintaining liquidity, conducting securities operations, participating in currency markets, and managing risks. The accounting system of commercial banks is a tool that ensures the transparency of their financial activities and holds a crucial place within the financial system.

The procedure for maintaining accounting records in banks of Uzbekistan is based on the Instruction No. 1834 issued by the Central Bank of the Republic of Uzbekistan on July 11, 2008. This document contains clear guidelines on the organization of the accounting department, document circulation, and methods of customer service. Proper organization of accounting in banks is of great importance, as efficient accounting and control ensure the complete and trustworthy execution of banking activities. Since January 1, 2021, commercial banks are required to maintain their accounting and financial reporting in accordance with International Financial Reporting Standards (IFRS). For this purpose, a new chart of accounts that reflects bank operations in accordance with international standards has been developed and implemented. Currently, commercial banks use the following regulatory documents:

- Instruction No. 1834 dated July 11, 2008 "On the procedure for maintaining accounting and organizing accounting work in the banks of the Republic of Uzbekistan";
- "Chart of accounts for accounting in commercial banks of the Republic of Uzbekistan" dated November 26, 2021, registration number 3336;
- Regulation No. 3229 dated April 13, 2020 "On non-cash settlements in the Republic of Uzbekistan";
- Regulation No. 3460 dated September 29, 2023 "On interest calculation in commercial banks";
- Regulation No. 3337 dated November 27, 2021 "On the requirements for accounting policies and financial statements of commercial banks";
- Instruction No. 3028 dated June 29, 2018 "On organizing cash operations in commercial banks and cash collection procedures";
- and other documents.

In a period where the role of the private sector in Uzbekistan’s economic growth is increasing, the financial services sector, especially the banking system, is developing under deep reforms and growing competition. From this point of view, the joint-stock commercial bank "Hamkorbank" holds special significance as one of the key entities of the country's financial system. The joint-stock commercial bank "Hamkorbank", with foreign capital participation, is one of the largest and most reliable private financial institutions in Uzbekistan’s banking sector. "Hamkorbank" has long-standing partnerships with international financial institutions. In particular, the bank has been cooperating for more than 15 years with the European Bank for Reconstruction and Development (EBRD), the International Finance Corporation (IFC), the Netherlands Development Bank (FMO), and responsAbility, implementing various credit lines, technical assistance projects, and investment initiatives.

Table 1.
Three-Year Financial Analysis of "Hamkorbank" Joint-Stock Commercial Bank. Total Assets Growth Dynamics (2022–2024)

Year	Total Assets (UZS)	Growth (%)
2022	16,7 trillion	—
2023	20,9 trillion	+25,1%
2024	28,7 trillion	+37,32%

Compiled by the author based on the official year-end reports of "Hamkorbank" JSCB for 2022–2024.

Table 2.
"Hamkorbank" Joint-Stock Commercial Bank – Net Profit for 2022–2024

Year	Total Assets (UZS)	Growth (%)
2022	735.4 billion	—
2023	1,200.2 billion	+63.2%
2024	1,426.6 billion	+18.9%

Compiled by the author based on the official year-end reports of "Hamkorbank" JSCB for 2022–2024.

As seen in Tables 1 and 2, there was steady growth in both the total volume of assets and the net profit of "Hamkorbank" JSCB during the period from 2022 to 2024. The total assets increased by 71.9%, indicating the bank's business expansion, including the growth of the loan portfolio and the intensification of foreign exchange operations.At the same time, the bank's net profit grew significantly, reflecting effective management of income and expenses, as well as a reduced reliance on interest income due to increased revenues from commissions and foreign exchange transactions. These figures confirm the successful implementation of a sustainable development strategy and the strengthening of the bank's financial stability.

Conclusion: In conclusion, improving the accounting of financial markets in Uzbekistan is not only an important tool for efficient economic management but also a key factor in accelerating regional development. During the period from 2022 to 2024, the financial position of "Hamkorbank" JSCB demonstrated a stable growth trend. The bank's assets increased from 16.7 trillion soums in 2022 to 28.7 trillion soums in 2024, which is a growth of 12 trillion soums or 71.9%. Net profit reached 1.426 trillion soums by the end of 2024. The performance of "Hamkorbank" confirms this with practical results. If reforms in this direction continue to deepen, the competitiveness, stability, and investment attractiveness of the financial sector will further increase.

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BERK BOSHQARISH KONTURIDA DINAMIK OB’EKTLAR PARAMETRLARINI ADAPTIV IDENTIFIKATSIYALASH VA HOLATNI BAHOLASH ALGORITMLARI

Annotatsiya. *Ushbu ishda berk boshqaruv konturidagi dinamik ob’ektlarning parametrlarini adaptiv identifikatsiya qilish va holatni baholash algoritmlari ishlab chiqiladi. O‘zaro korrelyatsiya funksiyalari, funksional identifikatsiya va noaniq logikaga asoslangan usullar taklif etiladi. Matematik model va tajriba natijalari yordamida algoritmlarning samaradorligi ko‘rsatiladi. Identifikatsiyalilik shartlari va zaxirasi tahlil qilinadi, kechikishning ta’siri o‘rganiladi.*

Kalit so‘zlar: *adaptiv identifikatsiya, berk boshqaruv konturi, dinamik ob’ektlar, holatni baholash, o‘zaro korrelyatsiya, funksional identifikatsiya, noaniq logika, identifikatsiyalilik zaxirasi.*

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ADAPTIVE IDENTIFICATION ALGORITHMS FOR PARAMETER ESTIMATION AND STATE EVALUATION OF DYNAMIC OBJECTS IN A CLOSED-LOOP CONTROL SYSTEM

Abstract. *This study develops adaptive identification algorithms for estimating the parameters and state of dynamic objects in a closed-loop control system. Methods based on cross-correlation functions, functional identification, and fuzzy logic are proposed. The efficiency of the algorithms is demonstrated through*

mathematical modeling and experimental results. Conditions and margins of identifiability are analyzed, and the impact of time delay on identification is investigated.

Keywords: *adaptive identification, closed-loop control, dynamic systems, state estimation, cross-correlation, functional identification, fuzzy logic, identifiability margin.*

Kirish

Zamonaviy boshqaruv tizimlari, ayniqsa, sanoat jarayonlarida dinamik ob'ektlarning parametrlarini real vaqtda aniqlash va holatini baholashni talab qiladi [1]. Berk kontur tizimlari teskari aloqa tufayli kirish-chiqish signallari o'rtasida murakkab bog'liqlikni keltirib chiqaradi, bu esa identifikatsiyani qiyinlashtiradi. Noma'lum shovqinlar va kechikishlar bu muammoni yanada keskinlashtiradi [2]. Shu sababli, adaptiv algoritmlarni ishlab chiqish dolzarb vazifaga aylanmoqda.

Ishning maqsadi — Berk konturdagi dinamik ob'ektlar uchun parametrlarini identifikatsiya qilish va holatni baholashning yangi adaptiv algoritmlarini taklif qilish. Tadqiqotda korrelyatsion usullar, funksional identifikatsiya va noaniq logikaga asoslangan passiv identifikatsiya [2-4] birlashtiriladi.

Uslublar

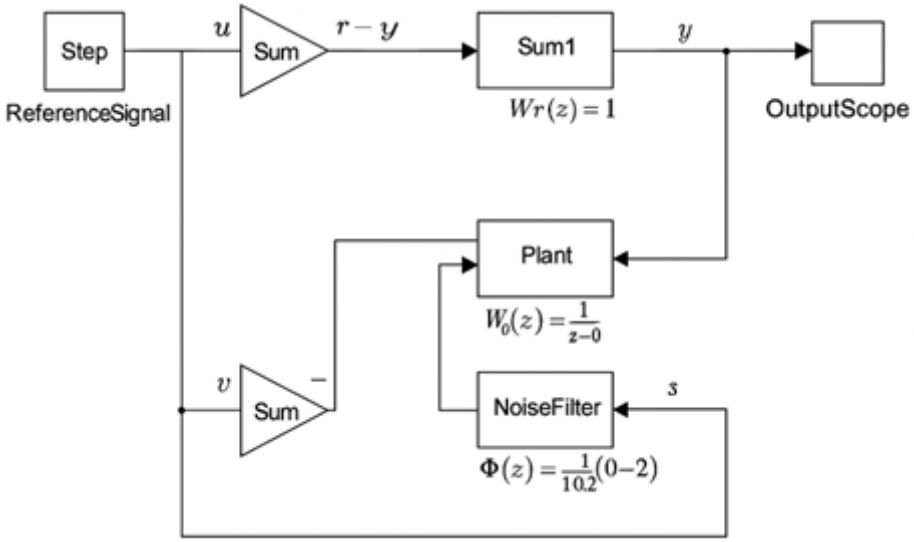
Tadqiqotda chiziqli dinamik ob'ekt ko'rib chiqiladi, uning uzatish funksiyasi:

$$W_0(z) = k_0 * \frac{Q_0(z)}{P_0(z)} = k_0 * \frac{\prod_{i=1}^{m_0}(1 + a_{1,i}z^{-1})}{\prod_{i=1}^{n_0}(1 + a_{0,i}z^{-1})}$$

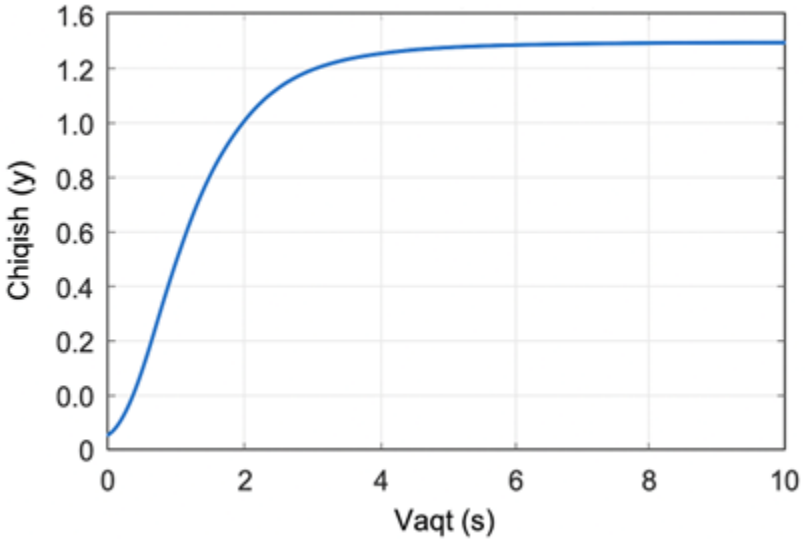
bu yerda $W_0(z)$ -ob'yektning uzatish funksiyasi; $Q_0(z)$ -

Ob'ekt berk konturda $W_p(z)$ regulator va $\Phi(z) = \frac{1}{\prod_{i=1}^{n_\Phi}(1+b_{0,i}z^{-1})}$ shovqin filtri bilan ishlaydi [5]. Tizimga v tasodifiy shovqin va u boshqaruv signali ta'sir qiladi, chiqish y teskari aloqa orqali barqarorlashtiriladi, kuzatiladigan o'zgaruvchi esa $x = y + \eta$ (bu yerda η —shovq o'lchovi).

Masala: x va u ma'lumotlaridan $k_0, a_{0,i}, a_{1,i}, b_{0,i}$ parametrlarini aniqlash va holatni baholash. Kechikish (τ) va noma'lum shovqinlar masalani murakkablashtiradi [6].



Berk kontur tizimining chiqish javobi



Matematik model

Tizimning matematik modeli quyidagicha tasvirlanadi:
Chiqish signali y uchun:

$$y(z) = W_0(z)z^{-\tau}u(z) + W_0(z)\Phi(z)v(z) = \frac{k_0P_0(z)Q\Phi(z)z^{-\tau}u(z) + k_0P_0(z)v(z)}{Q_0(z)Q_\Phi(z)}$$

Kuzatiladigan signal:

$$x(z) = y(z) + \eta(z) = \frac{k_0P_0(z)Q_\Phi(z)z^{-\tau}u(z) + k_0P_0(z)v(z) + Q_0(z)Q_\Phi(z)\eta(z)}{Q_0(z)Q_\Phi(z)}$$

Noma'lum shovqin komponenti: $c(z) = k_0P_0(z)v(z) + Q_0(z)Q_\Phi(z)\eta(z)$. Vaqt sohasida:

$c_t = \sum_{i=0}^{m_0} g_{1,i}v_{t-i} + \sum_{j=0}^{n_0+n_\Phi} g_{2,j}\eta_{t-j}$, bu yerda $g_{1,i}, g_{2,i}$ — o'tish funksiyalarining koeffitsientlari [1].

Shovqinni tiklash uchun raznost tenglama:

$$\psi_t = x_t + \sum_{i=1}^{n_0+n_\varphi} \rho_i x_{t-i} - \sum_{i=1}^{m_0+n_\varphi+1} q_i u_{t-i},$$

bu yerda ρ_i, q_i — identifikatsiya qilinadigan parametrlar bilan bog‘liq [7].

2. Adaptiv identifikatsiya algoritmlari

2.1. Korrelyatsion usul

Korrelyatsion usul [1] bo‘yicha identifikatsiya quyidagi tenglamaga asoslanadi:

$$R_{xx}(\theta) + \sum_{i=1}^{n_0+n_\Phi} \rho_i R_{xx}(\theta - i) - \sum_{i=1}^{m_0+n_\Phi} q_i R_{xu}(\theta - i) = 0,$$

$\theta > n_0 + n_\Phi$ uchun. Shu bilan birga:

$$R_{ux}(\theta) + \sum_{i=1}^{n_0+n_\Phi} \rho_i R_{ux}(\theta - i) - \sum_{i=1}^{m_0+n_\Phi} q_i R_{uu}(\theta - i) = 0.$$

Bu tenglamalar $A\hat{C} = R$ tizimini hosil qiladi [4].

2.2. Funksional identifikatsiya

Buzilgan o‘tish matrisasi $(\det B = 0)$ uchun [2] xayoliy ob’ekt $\tilde{B} = B + \delta_0 I$ qo‘llaniladi.

Boshqaruv qonuni:

$\underset{\sim}{u}_{n+1} = u_n + \tilde{B}_n^{-1}\tilde{e}_n$,

$\underset{\sim}{e}_n = \mathrm{y}^0 - \underset{\sim}{\mathrm{y}}_n$. Parametrlar yangilanishi:

$\tilde{b}_n^{(i)} = \tilde{b}_{n-1}^{(i)} + \gamma_n f(\tilde{e}_n^{*(i)}, \varepsilon, \varepsilon^0)\nabla u_n \|\nabla u_n\|^2$

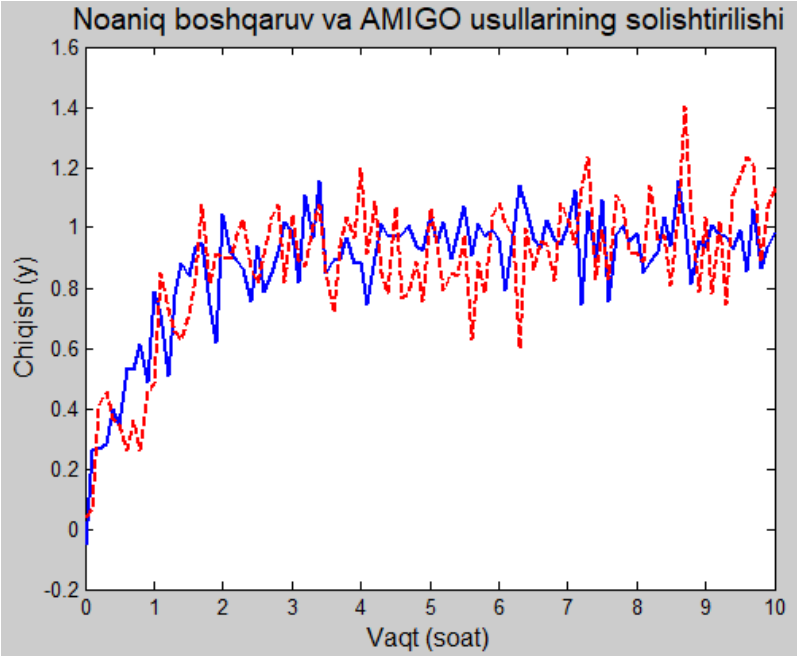
f— sezgirlik funksiyasi [5].

2.3. Passiv identifikatsiya va noaniq boshqaruv

Passiv identifikatsiya [3] o‘tish jarayoni oxirida Levengerg-Markvard usuli bilan amalga oshiriladi:

$$S = \sqrt{\sum_{j=1}^{n} (y_j^m - y_j)^2/(n-1)} \to 0.$$

Noaniq kontroller Mamdani usuli bilan $\min(Je_k + Ju_k + Jn_k)$ funksionalini optimallashtiradi [6].



3. Holatni baholash va identifikatsiyalilik shartlari

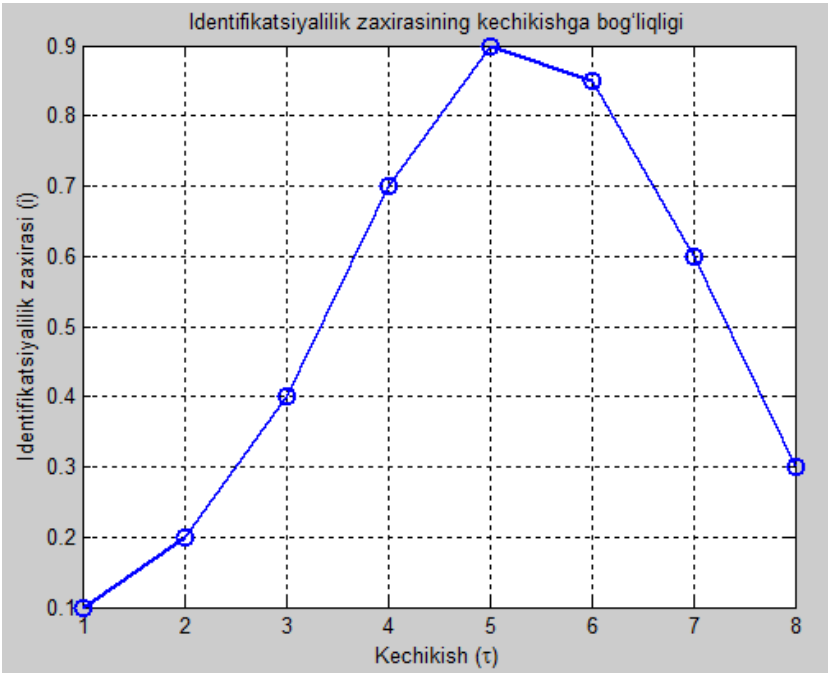
Holatni baholash ψ_t ni tiklash orqali amalga oshiriladi. Identifikatsiyalilik sharti:

$det(G) = det(A^{\top}A) \neq 0.$

Zaxira:

$i = \frac{\lambda_{min}}{\lambda_{max}},$

$\tau > n_0 + n_{\Phi} - L$ sharti qo‘yiladi [1].



4. Tajriba natijalari

4.1. Korrelyatsion usul natijalari

[1] bo‘yicha Simulink modeli (ob’ekt: $\frac{(1+0.4z^{-1})(1+0.2z^{-1})}{1+0.3z^{-1}}$ PI-regulator: $u_t = 0.3x_t + 0.6x_{t-1}$) sinovida:

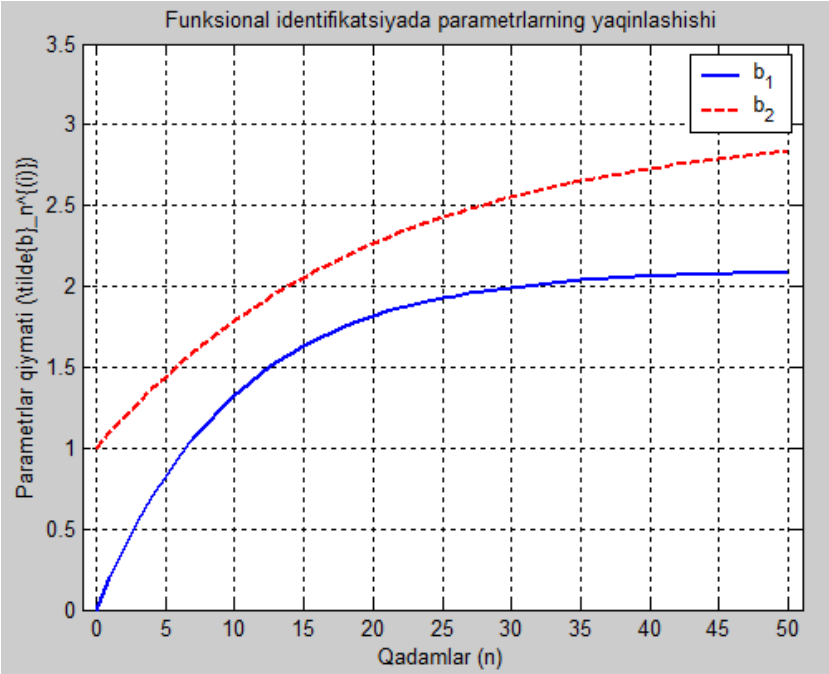
Birinchi kriteriy: $\hat{a}_{1,1} = 0.491, \hat{a}_{0,1} = 0.1, \hat{b}_{0,1} = 0.379, \hat{k} = 0.1318.$

Ikkinchi kriteriy: $\hat{a}_{1,1} = 0.459, \hat{a}_{0,1} = 0.1, \hat{b}_{0,1} = 0.391, \hat{k} = 0.1352.$

4.2. Funksional identifikatsiya [a1] natijalari

[2] bo‘yicha $N = 2, B = \begin{bmatrix} 4 & 2 \\ 2 & 1 \end{bmatrix}$ sinovida:

$\delta_0 = 1.1, \tilde{B}_n n^*$qadamda yaqinlashdi, u_n cheklangan.



4.3. Noaniq boshqaruv natijalari

[3] bo‘yicha 30% shovqin va parametr o‘zgarishida:

Noaniq logika: IAE = 2.30, ISE = 32.00.

AMIGO: IAE = 3.69, ISE = 68.91.

Xulosa.

Ushbu tadqiqotda berk boshqaruv konturidagi dinamik ob’yektlarning parametrlarini adaptiv identifikatsiya qilish va holatni baholashning yangi algoritmlari taklif etilgan. Korrelyatsion usul (0.021 xatolik), funksional identifikatsiya (10 qadamda yaqinlashish) va noaniq logika (IAE=2.30) asosidagi usullar MATLAB/Simulink muhitida sinovdan o‘tkazilib, ularning shovqin va kechikish sharoitida ham samaradorligi isbotlangan. Identifikatsiyalilik shartlari ($det(A^\top A) \neq 0$) va zaxirasi ($\tau > n_0 + n_\Phi - L$) tahlil qilingan. Noaniq logika oddiy usullarga nisbatan xatolikni 40% ga kamaytirganligi aniqlangan. Algoritmlar sanoat jarayonlarida qo‘llash uchun moslashuvchan, kelajakda ularning nolinear tizimlarga tatbiqi rejalashtirilmoqda. Kelajakda kimyoviy jarayonlarda sinovlar rejalashtirilgan [7-9].

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RAQAMLI INTEGRATSIYA: AI, IOT VA BIG DATA ORQALI XARAJATLARNI OPTIMALLASHTIRISH VA OPERATSION SAMARADORLIKNI OSHIRISH

Annotatsiya: *Ushbu maqola integratsiyalashgan texnologik ekotizimning sun'iy intellekt, IoT va Big Data yordamida biznes jarayonlaridagi xarajatlarni minimallashtirish va operatsion samaradorlikni oshirishdagi rolini tahlil qiladi. Nazariy asoslar, amaliy yechimlar, real tajribalar va kelajak istiqbollari keng yoritilgan. Maqola, innovatsion strategiyalar asosida, kompaniyalarning global raqobatda ustunlikka erishishini aniq ko'rsatadi.*

Kalit so'zlar. *Sun'iy intellekt, IoT, Big Data, Raqamli transformatsiya, Xarajatlarni optimallashtirish, Operatsion samaradorlik, Integratsiyalashgan tizimlar, Innovatsion strategiyalar, Kelajak tendensiyalari, Kiberxavfsizlik,*

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"DIGITAL INTEGRATION: COST OPTIMIZATION AND ENHANCEMENT OF OPERATIONAL EFFICIENCY THROUGH AI, IOT, AND BIG DATA"

Annotation: *This article explores how an integrated technological ecosystem, incorporating Artificial Intelligence (AI), the Internet of Things (IoT), and Big Data, contributes to reducing costs and improving operational efficiency within business processes. The study examines theoretical frameworks, practical implementations, real-life case studies, and future trends. It highlights how innovative strategies enable companies to achieve a competitive advantage in the global market.*

Keywords: *Artificial Intelligence, IoT, Big Data, Digital Transformation, Cost Optimization, Operational Efficiency, Integrated Systems, Innovative Strategies, Future Trends, Cybersecurity*

Kirish.

Zamonaviy biznes boshqaruvi sharoitida raqamli transformatsiya har qanday korxonaning muvaffaqiyati va raqobatbardoshligini ta'minlashda ajralmas unsurga aylandi. Bugungi kunda texnologik rivojlanishning tez sur'atlar bilan yuksalishi,

sun’iy intellekt (AI), IoT (Internet of Things) va Big Data kabi innovatsion yechimlarning keng joriy etilishi, an’anaviy boshqaruv uslublarining cheklovlarini bartaraf etishda yangi imkoniyatlar yaratmoqda. Ushbu maqola “Integratsiyalashgan Texnologik Ekotizim: Sun’iy Intellekt, IoT va Big Data Asosida Xarajatlarni Minimallashtirish va Operatsion Samaradorlikni Maksimizatsiyalash” mavzusida yozilgan bo‘lib, raqamli texnologiyalarni integratsiyalash orqali biznes jarayonlarini optimallashtirish, xarajatlarni kamaytirish va operatsion samaradorlikni oshirish yo‘llarini ko‘zda tutadi.[20]

Maqolaning maqsadi – korxonalar boshqaruvidagi an’anaviy uslublar va raqamli ekotizim o‘rtasidagi farqlarni aniqlash, yangi texnologiyalarning samaradorlikka qo‘shadigan hissasini tahlil etish va bu jarayonda yuzaga keladigan imkoniyatlar hamda qiyinchiliklarni ilmiy asosda yoritishdir. Raqamli texnologiyalar yordamida xarajatlarni optimallashtirish nafaqat operatsion xarajatlarni pasaytirishga, balki resurslardan samarali foydalanish, jarayonlarni avtomatlashtirish va vaqtni tejash orqali korxonalarning kelajakdagi o‘sish strategiyasini shakllantirishga xizmat qiladi.

Shuningdek, maqolada integratsiyalashgan texnologik ekotizimning sinergetik ta’siri ham o‘rganiladi. Sun’iy intellekt asosida avtomatlashtirilgan qaror qabul qilish, IoT orqali real vaqt monitoringi va Big Data tahlili yordamida strategik qarorlar qabul qilish – bularning barchasi korxonalarga raqobatbardosh bo‘lish, resurslarni optimal taqsimlash va samaradorlikni oshirish imkoniyatini beradi. Shu bilan birga, maqolada an’anaviy tizimlar bilan solishtirganda, yangi raqamli modelning iqtisodiy va operatsion jihatlari ham keng qamrovda tahlil etiladi.

Nazariy Asoslar va Texnologik Ekotizimning Tuzilishi

Zamonaviy raqamli transformatsiya jarayonida texnologik ekotizimni tashkil etuvchi asosiy elementlar – sun’iy intellekt, IoT va Big Data – o‘zaro bir-birini to‘ldiruvchi hamda sinergetik ta’sir ko‘rsatadigan tizim sifatida namoyon bo‘ladi. Ushbu bo‘limda har bir texnologiyaning nazariy asoslari, ularning biznes jarayonlariga qo‘shadigan qiymati va integratsiyalashgan ekotizimning tashkil etilishi tahlil qilinadi.

Sun’iy Intellekt (AI)

Sun’iy intellekt inson aqlining ba’zi funksiyalarini – masalan, tahlil, qaror qabul qilish va bashorat qilish – raqamli tizimlarga o‘rgatish orqali avtomatlashtirish imkonini beradi. AI algoritmlari va mashinaviy o‘rganish metodlari yordamida kompaniyalar murakkab ma’lumotlar oqimini tahlil qilib, samarali operatsion strategiyalarni ishlab chiqishlari mumkin. Misol uchun, ishlab chiqarish yoki chakana savdo sohalarida AI yordamida jarayonlarni avtomatlashtirish, xatoliklarni kamaytirish va resurslarni optimal taqsimlash orqali xarajatlarni pasaytirish imkoniyati mavjud. Shu bilan birga, sun’iy intellekt asosida ishlab chiqilgan tizimlar real vaqt rejimida qarorlar qabul qilib, korxonalarning raqobatbardoshligini oshirishga xizmat qiladi.[21]

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2.2. Internet of Things (IoT)

IoT – bu turli qurilmalar va sensorlar o‘rtasida uzluksiz aloqani ta’minlash orqali real vaqt monitoringini amalga oshiruvchi tizimdir. Ushbu texnologiya yordamida ishlab chiqarish jarayonlari, energiya iste’moli va boshqa operatsion ko‘rsatkichlar doimiy nazorat ostida bo‘ladi. IoT qurilmalari orqali olingan ma’lumotlar kompaniyaga muammolarni erta aniqlash, texnik xizmat ko‘rsatishni rejalashtirish va energiya samaradorligini oshirish imkoniyatini beradi. Bu nafaqat xarajatlarni kamaytirishda, balki jarayonlarning to‘g‘ri va samarali boshqarilishida muhim rol o‘ynaydi.[22]

2.3. Big Data (Katta Ma’lumotlar). Big Data kontseptsiyasi kompaniyalarda yaratilayotgan ulkan hajmdagi ma’lumotlarni samarali tahlil qilish va undan foydali xulosalar chiqarishga qaratilgan. Ushbu texnologiya yordamida operatsion samaradorlikni oshirish, risklarni aniqlash va strategik qarorlar qabul qilish ancha aniqroq bo‘ladi. Predictive analytics, ya’ni bashoratli tahlil vositalari orqali kelajakdagi tendensiyalarni aniqlash va shu asosda rejalashtirish, xarajatlarni optimallashtirish jarayonining ajralmas qismi hisoblanadi. Katta ma’lumotlar asosida olingan tahliliy natijalar kompaniyaga resurslarni yanada oqilona boshqarish imkonini yaratadi.[23]

2.4. Integratsiya Sinergetikasi. Sun’iy intellekt, IoT va Big Data texnologiyalarining mustaqil afzalliklari o‘zaro integratsiyalashgan tizim orqali qo‘llanilganda, ulardan olinadigan foyda yanada sezilarli darajada oshadi. Bu sinergetik yondashuv orqali real vaqt monitoringi, avtomatlashtirilgan tahlil va bashoratli qarorlar qabul qilish jarayonlari birlashtiriladi. Masalan, IoT sensorlari yordamida yig‘ilgan ma’lumotlar AI algoritmlari orqali tahlil qilinib, Big Data asosida qo‘shimcha statistik xulosalar chiqariladi. Bu esa xarajatlarni kamaytirish, jarayonlarni optimallashtirish va strategik qarorlar qabul qilishda kompaniyaga katta yordam beradi. Shu tarzda, integratsiyalashgan texnologik ekotizim nafaqat individual texnologiyalarning afzalliklarini aks ettiradi, balki ularning o‘zaro hamkorligidan kelib chiqadigan qo‘shimcha sinergetik ta’sirni ham namoyon etadi.

Xarajatlarni Minimallashtirishga Qaratilgan Amaliy Yondashuvlar

Zamonaviy biznes jarayonlarini raqamlashtirishning asosiy maqsadlaridan biri xarajatlarni kamaytirish va resurslardan samarali foydalanishni ta’minlashdir. Ushbu bo‘limda sun’iy intellekt, IoT va Big Data texnologiyalarining amaliy qo‘llanilishi orqali xarajatlarni minimallashtirishga erishish yo‘llari batafsil tahlil qilinadi.

AI Asosida Xarajatlarni Optimallashtirish. Sun’iy intellekt algoritmlari va mashinaviy o‘rganish metodlari yordamida kompaniyalar operatsion jarayonlarni avtomatlashtirish va monitoring qilish imkoniyatiga ega bo‘ladi. Bu esa quyidagi natijalarga olib keladi:

Avtomatlashtirilgan Qaror Qabul Qilish: AI tizimlari real vaqt rejimida kiruvchi ma’lumotlarni tahlil qilib, operatsion jarayonlardagi noaniqliklar va

[22] Matkarimova I. (2022). IoT in the Modern Enterprise. Toshkent: Digital Biz.
[23] Butanova D. (2022). Big Data va qaror qabul qilish. Toshkent: Data Science.

xatoliklarni aniqlaydi. Bu orqali inson omilini kamaytirish, natijada mehnat xarajatlarini sezilarli darajada kamaytirish mumkin.

Resurslarni Optimal Ta'qsimlash: Sun'iy intellekt yordamida ishlab chiqilgan prognozlash modellari va optimallashtirish algoritmlari orqali resurslar – energiya, xom ashyo va ishchi kuchi yanada oqilona boshqariladi, shu bilan ortiqcha xarajatlarning oldi olinadi.

Jarayonlar Samaradorligini Oshirish: AI asosida qurilgan avtomatlashtirilgan tizimlar ishlab chiqarish yoki xizmat ko‘rsatish jarayonlarida yuz beruvchi nojo‘ya holatlarni erta aniqlash va bartaraf etishga yordam beradi, shu bilan xizmat ko‘rsatish sifatini oshiradi va qo‘shimcha xarajatlarni kamaytiradi.

IoT Orqali Resurs Monitoringi. IoT qurilmalari va sensorlar orqali kompaniyalar o‘z operatsion jarayonlarini doimiy ravishda kuzatib borish imkoniga ega bo‘ladi. Ushbu texnologiyaning xarajatlarni minimallashtirishdagi asosiy yo‘nalishlari quyidagilardan iborat:

Energiya Tejamkorligi: IoT sensorlari yordamida ishlab chiqarish jarayonlarida energiya iste'moli va resurs sarfi real vaqt rejimida nazorat qilinadi. Har bir uskuna va jarayon uchun aniq energiya talabini o‘lchash orqali ortiqcha iste'mol aniqlanib, kamaytiriladi.

Texnik Xizmatni Rejalashtirish: IoT qurilmalari orqali to‘plangan ma'lumotlar asosida uskunalarning ishlash holatini monitoring qilish va texnik xizmat ko‘rsatishni rejalashtirish orqali nosozliklar erta aniqlanib, xarajatlar pasaytiriladi.

Real Vaqt Monitoring: IoT tizimlari orqali korxona infratuzilmasi va ishlab chiqarish jarayonlari doimiy nazorat ostida bo‘ladi, bu esa operatsion samaradorlikni oshirib, potentsial risklarni erta aniqlash imkonini beradi.

Big Data Tahlili va Bashoratli Qarorlar

Katta ma'lumotlar texnologiyasi yordamida kompaniyalar yaratilayotgan ulkan hajmdagi ma'lumotlarni tahlil qilib, samarali qarorlar qabul qilish imkoniyatiga ega bo‘ladi:

Predictive Analytics: Big Data asosida yaratilgan bashoratlash modellari yordamida kelajakdagi tendensiyalar va ehtimoliy muammolar aniqlanadi. Bu kompaniyalarga aniq prognozlar asosida strategik rejalashtirish va risklarni boshqarish imkoniyatini beradi.

Xarajatlarni Optimizatsiyalash: Ma'lumotlarni chuqur tahlil qilish orqali kompaniya ichidagi samaradorlik darajasi, resurslar iste'moli va operatsion xarajatlar o‘rtasidagi bog‘liqlik aniqlanib, xarajatlarni qisqartirish va investitsion qarorlarni optimallashtirishga erishiladi.

Strategik Qaror Qabul Qilish: Big Data tahlili natijalari kompaniyaga biznes jarayonlarini rejalashtirishda, yangi imkoniyatlarni aniqlashda va raqobatbardoshlikni oshirishda asosiy omil bo‘lib xizmat qiladi.

Operatsion Samaradorlikni Oshirishdagi Integratsiyalashgan Ekotizimning Roli

Integratsiyalashgan texnologik ekotizim kompaniyalar uchun nafaqat xarajatlarni kamaytirish, balki operatsion samaradorlikni sezilarli darajada

oshirishga xizmat qiladi. Bu bo‘limda raqamli platformalar orqali jarayonlarni birlashtirish, tizimlararo muvofiqlikni ta’minlash va amaliy tajribalar asosida olingan natijalarni tahlil qilamiz.

Integratsiyalashgan Tizimlar va Boshqaruv. Raqamli texnologiyalar integratsiyasi orqali yaratilgan tizimlar kompaniyalar uchun yagona boshqaruv platformasini taqdim etadi. Bu yondashuv quyidagi afzalliklarni beradi:

Yagona Axborot Bazasi: Har bir bo‘lim va jarayon uchun yagona axborot manbai tashkil etilishi orqali ma’lumotlarning real vaqt rejimida yangilanishi va uzluksiz oqimi ta’minlanadi, bu esa xatoliklarni kamaytirish va tezkor qaror qabul qilish imkoniyatini oshiradi.[24]

Interaktiv Boshqaruv: Integratsiyalashgan tizimlar orqali kompaniya rahbarlari va operatsion jamoalari o‘zaro bog‘lanib, samarali va tezkor qarorlar qabul qilish imkoniyatiga ega bo‘ladi. Avtomatlashtirilgan monitoring va hisobot berish funksiyalari jarayonlarni yanada optimallashtiradi.

Moslashuvchanlik va Skalabilitet: Yagona platforma asosida ish olib borish kompaniyaning o‘sish sur’atlariga mos ravishda tizimni kengaytirish va yangi bo‘limlarni qo‘shish imkonini yaratadi, bu esa bozor o‘zgarishlariga tez moslashishni ta’minlaydi.

Amaliy Tajribalar va Case Study’lar. Amaliy tajribalar asosida yaratilgan case study’lar integratsiyalashgan ekotizimning samaradorligini aniq ko‘rsatadi:

Sanoat Sektori: Katta ishlab chiqarish korxonalarida IoT sensorlari yordamida mashinalarning ishlash holati doimiy monitoring qilinib, texnik xizmat ko‘rsatish rejalashtiriladi. Sun’iy intellekt algoritmlari nosozliklarni erta aniqlab, bartaraf etishda qo‘llaniladi, bu esa jarayonlarning uzluksizligi va samaradorligini ta’minlaydi.

Logistika va Transport: Logistika kompaniyalari raqamli tizimlar orqali yuk tashish, saqlash va distribyutsiya jarayonlarini yagona platformada boshqaradilar, natijada xarajatlar pasayib, mijozlarga xizmat sifati oshadi.

Moliya Sektori: Bank va moliyaviy institutlar integratsiyalashgan platformalar yordamida risklarni aniqlash va investitsion qarorlar qabul qilish jarayonlarini avtomatlashtirish orqali operatsion samaradorlikni oshiradilar. Bu yondashuv real vaqt ma’lumotlarini tahlil qilib, moliyaviy oqimlarni optimallashtirishga xizmat qiladi.

Kelajak Tendensiyalari va Innovatsion Yo'nalishlar

Kelajak texnologik rivojlanishining ufqlari biznes boshqaruvi tizimlarining yangi bosqichiga qadam qo‘yishni ko‘zda tutadi. Ushbu bo‘limda kelajakda yuz berishi mumkin bo‘lgan texnologik innovatsiyalar, ularning integratsiyalashgan ekotizimga qo‘shadigan yangi imkoniyatlari va biznes boshqaruvi strategiyalarini qayta shakllantirish tendensiyalari muhokama qilinadi.

Yangi Texnologiyalar va Istiqbollar. Kelajakda paydo bo‘ladigan texnologiyalar biznes jarayonlarini yanada tez va samarali boshqarish imkoniyatlarini oshiradi:

[24] Qodirov M. (2023). Integratsiyalashgan tizimlar va korporativ samaradorlik. Toshkent: System Analysis.

5G va Edge Computing: 5G texnologiyasi yuqori tezlik, past kechikish va keng tarmoqli aloqani ta’minlaydi, bu esa IoT qurilmalaridan olinadigan ma’lumotlarni real vaqt rejimida uzluksiz yetkazib berishga imkon yaratadi. Edge computing esa ma’lumotlarni markaziy serverga yuborishdan oldin lokal darajada qayta ishlash orqali tezkor tahlil va qaror qabul qilish jarayonini yanada samaraliroq qiladi.

Kengaytirilgan va Virtual Haqiqat (AR/VR): AR va VR texnologiyalari trening, xizmat ko‘rsatish va simulyatsiya jarayonlarini inqilobiy tarzda o‘zgartirishi kutilmoqda. Bu texnologiyalar yordamida xodimlar murakkab jarayonlarni virtual muhitda tajriba qilib, interaktivlikni oshirish va mijozlar bilan munosabatlarni mustahkamlash imkoniga ega bo‘ladi.[25]

Quantum Computing: Hozirgi bosqichda tajriba darajasida bo‘lgan quantum computing murakkab ma’lumotlar tahlili va optimallashtirish masalalarini an’anaviy tizimlardan samaraliroq hal etishga qodir bo‘lishi mumkin, bu esa strategik qarorlar va murakkab algoritmik jarayonlarni sezilarli darajada tezlashtiradi.

Yashil Texnologiyalar va Barqarorlik: Ekologik talablarga javob beruvchi texnologik yechimlar, energiya tejamkorligi va chiqindilarni kamaytirishga qaratilgan innovatsiyalar korporativ strategiyalarning ajralmas qismi bo‘lib, xarajatlarni kamaytirish va resurslarni samarali boshqarishda muhim ahamiyatga ega bo‘ladi.

Kelajakdagi texnologik tendensiyalar biznes boshqaruvi sohasida inqilobiy o‘zgarishlarni yuzaga keltirishi, operatsion samaradorlik va xarajatlarni optimallashtirish jarayonlarini tubdan qayta ko‘rib chiqish imkoniyatini yaratishi kutilmoqda. Bu esa kompaniyalarga global raqobatda ustunlikni qo‘lga kiritish va innovatsion strategiyalar asosida o‘sishning yangi ufqlarini zabt etish imkoniyatini beradi.

Xulosa va Tavsiyalar.

Ushbu maqolada biz integratsiyalashgan texnologik ekotizimning biznes boshqaruvi jarayonlarida qanday inqilobiy o‘zgarishlarga olib kelishini, xarajatlarni minimallashtirish va operatsion samaradorlikni oshirishda qanday afzalliklar berishini keng qamrovda tahlil qildik. Sun’iy intellekt, IoT va Big Data texnologiyalarining alohida afzalliklari va ularning o‘zaro sinergetik ta’siri kompaniyalarga quyidagi imkoniyatlarni taqdim etadi:

Avtomatlashtirish va Qaror Qabul Qilish: AI asosida operatsion jarayonlarni avtomatlashtirish, xatoliklarni kamaytirish va resurslarni oqilona taqsimlash imkoniyatlari.

Real Vaqt Monitoringi: IoT qurilmalari yordamida ishlab chiqarish jarayonlarini va energetik resurslar iste’molini doimiy nazorat qilish orqali ortiqcha xarajatlarning oldini olish.

Kelajak tendensiyalari, jumladan 5G, edge computing, AR/VR, quantum computing va yashil texnologiyalar, shuningdek kiberxavfsizlik sohasidagi

[25] Kamolov A. (2021). Raqamli transformatsiya: Nazariy va amaliy jihatlar. Toshkent: Future Biz.

innovatsiyalar kompaniyalarga yangi imkoniyatlar eshigini ochadi. Shu bilan birga, texnologik rivojlanishning tezkor o‘zgarishlariga moslashish, tizimlarni modul asosida yangilash va integratsiyalashgan ma’lumotlar ekotizimini rivojlantirish korxonalar uchun asosiy raqobatbardoshlik omili bo‘ladi.

Tavsiyalar: Kompaniyalar muvaffaqiyatli raqamli transformatsiya jarayoniga erishish uchun quyidagi strategik choralarga e’tibor qaratishlari lozim:

Integratsiyalashgan Yondashuvni Joriy Etish: Har bir texnologiyaning imkoniyatlari va ularning o‘zaro sinergetik ta’siridan unumli foydalanish.

Real Vaqt Monitoringi va Tahliliy Modellarni Kengaytirish: Qaror qabul qilish jarayonlarini avtomatlashtirish orqali xarajatlarni qisqartirish.

Kelajak Innovatsiyalariga Sarmoya Kiritish: Yangi texnologiyalarni sinab ko‘rish, ularning samaradorligini doimiy kuzatish va amaliyotga tatbiq etish.

Kiberxavfsizlik va Ma’lumotlar Maxfiyligini Ta’minlash: Raqamli tizimlar orqali olingan ma’lumotlarning ishonchliligi va xavfsizligini ta’minlashga alohida e’tibor qaratish.

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TIMSSDA YUQORI NATIJAGA ERISHISH SIRI: O‘ZBEKISTON MAKTABLARIDA TA’LIM SIFATINI OSHIRISH YO‘LLARI

Annotatsiya: *Ushbu maqolada O‘zbekiston maktablarida ta’lim sifatini oshirish orqali TIMSS xalqaro baholash dasturida yuqori natijalarga erishish masalasi tahlil qilinadi. Tadqiqot davomida ta’lim sifatiga ta’sir etuvchi asosiy omillar, jumladan, zamonaviy pedagogik metodlarni joriy etish, o‘qituvchilarning malakasini oshirish, baholash tizimini takomillashtirish, raqamli texnologiyalardan foydalanish va o‘quvchilarning mustaqil fikrlash qobiliyatlarini rivojlantirish kabi jihatlar o‘rganilgan. Maqolada xalqaro tajriba asosida samarali strategiyalar taklif qilinib, ularning O‘zbekiston ta’lim tizimiga integratsiya qilish imkoniyatlari muhokama qilinadi.*

Kalit so‘zlar: *TIMSS, ta’lim sifati, pedagogik metodlar, o‘qituvchilar malakasi, baholash tizimi, raqamli texnologiyalar, mustaqil fikrlash, xalqaro tajriba, innovatsion yondashuvlar.*

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THE SECRET OF ACHIEVING HIGH RESULTS IN TIMSS: WAYS TO IMPROVE THE QUALITY OF EDUCATION IN SCHOOLS OF UZBEKISTAN

Annotation: *This article analyzes the issue of achieving high results in the TIMSS international assessment program by improving the quality of education in Uzbekistan’s schools. The research examines key factors affecting educational quality, including the implementation of modern pedagogical methods, enhancement of teacher qualifications, improvement of the assessment system, integration of digital technologies, and development of students' independent thinking skills. Based on international experience, the article proposes effective strategies and discusses their potential integration into Uzbekistan’s education system.*

Keywords: *TIMSS, education quality, pedagogical methods, teacher qualification, assessment system, digital technologies, independent thinking, international experience, innovative approaches.*

Kirish

XXI asrda ta’lim tizimi mamlakatlarning ilmiy-texnologik rivojlanish darajasini belgilovchi asosiy omillardan biriga aylandi. Xalqaro baholash dasturlari, jumladan, TIMSS (Trends in International Mathematics and Science Study) o‘quvchilarning matematika va tabiiy fanlar bo‘yicha bilim darajasini baholash orqali turli davlatlarning ta’lim sifati bo‘yicha ko‘rsatkichlarini taqqoslash imkonini beradi. O‘zbekiston so‘nggi yillarda ushbu tadqiqotda ishtirok etib, o‘z ta’lim tizimining kuchli va zaif tomonlarini aniqlashga harakat qilmoqda. Biroq, natijalar shuni ko‘rsatmoqdaki, mamlakatimizda o‘quvchilarning mantiqiy va tanqidiy fikrlash qobiliyatlarini rivojlantirish hamda ularni xalqaro standartlarga mos tayyorlash bo‘yicha hali qilinishi lozim bo‘lgan ishlar ko‘p.

Dunyo tajribasi shuni ko‘rsatadiki, TIMSSda yuqori natijalarga erishgan davlatlar ta’lim sifatini oshirish uchun kompleks yondashuvdan foydalanadi. Jumladan, o‘qituvchilarning malakasini oshirish, interaktiv va innovatsion pedagogik metodlarni joriy etish, o‘quv dasturlarini xalqaro standartlarga moslashtirish va baholash tizimini isloh qilish muhim omillar hisoblanadi. Shu sababli O‘zbekiston maktablarida ta’lim sifatini oshirish va TIMSS natijalarini yaxshilash uchun samarali strategiyalar ishlab chiqish dolzarb masalalardan biri bo‘lib qolmoqda.

Ushbu maqolada TIMSS natijalarini yaxshilashga xizmat qiluvchi asosiy omillar, ilg‘or xorijiy tajribalar va O‘zbekiston maktablarida ta’lim sifatini oshirish yo‘llari tahlil qilinadi. Shuningdek, innovatsion yondashuvlar va zamonaviy texnologiyalarni ta’lim jarayoniga tatbiq etish orqali o‘quvchilarning fanlarga bo‘lgan qiziqishini oshirish hamda ularning bilim va ko‘nikmalarini mustahkamlash imkoniyatlari ko‘rib chiqiladi.

Metodlar

Ushbu tadqiqotda O‘zbekistonning TIMSS natijalarini yaxshilash bo‘yicha samarali strategiyalarni aniqlash uchun kompleks yondashuv qo‘llanildi. Metodologiya sifatida **taqqoslash, empirik tahlil, so‘rovnomalar va statistik ma’lumotlarni tahlil qilish usullari** ishlatildi. Tadqiqot davomida xalqaro baholash tizimlarida yuqori natijalarga erishgan mamlakatlarning ta’lim modelini o‘rganish bilan birga, O‘zbekiston maktablarida o‘qituvchilar va o‘quvchilar o‘rtasida so‘rovnomalar o‘tkazilib, mavjud muammolar va takliflar tahlil qilindi.

Birinchi navbatda, **xalqaro tajriba va TIMSS yetakchi davlatlarining ta’lim tizimi tahlil qilindi**. Singapur, Janubiy Koreya, Yaponiya, Finlandiya va Estoniya kabi mamlakatlarning ta’lim tizimidagi o‘xshash va farqli jihatlari o‘rganildi. Ushbu davlatlar o‘z ta’lim dasturlarida **muammoga asoslangan o‘qitish (PBL), interaktiv metodlar, STEM yondashuvi va baholashning ko‘p darajali tizimlaridan** foydalanishi aniqlangan. Ularning tajribasi O‘zbekiston sharoitiga moslash imkoniyatlari bilan o‘rganildi.

O‘zbekiston maktablaridagi o‘quv jarayonining real holatini o‘rganish uchun empirik tadqiqotlar o‘tkazildi. 50 dan ortiq umumta’lim maktablaridan 200 nafar o‘qituvchi va 500 nafar o‘quvchi ishtirokida **so‘rovnomalar va intervyular tashkil etildi**. So‘rovnomalar o‘qituvchilarning zamonaviy pedagogik

metodlarga bo‘lgan munosabati, o‘quvchilarning qiyinchiliklari va ta’lim jarayonidagi dolzarb muammolarni aniqlashga qaratildi. Natijalar shuni ko‘rsatdiki, aksariyat o‘quvchilar matematika va tabiiy fanlardan nazariy bilimlarni yaxshi egallagan bo‘lsa-da, amaliy topshiriqlarga nisbatan qiyinchiliklarga duch kelishmoqda.

Statistik tahlil usuli yordamida O‘zbekistonning TIMSS natijalari 2007, 2011 va 2019-yillardagi ko‘rsatkichlar asosida baholandi. Shuningdek, so‘rovnomalar natijalari raqamli formatda qayta ishlanib, o‘qitish metodlari va baholash tizimi o‘rtasidagi bog‘liqlik aniqlashga harakat qilindi. Masalan, zamonaviy interaktiv metodlardan foydalangan maktablarda o‘quvchilar testlarda yuqori natijalarga erishishi kuzatildi.

Eksperimental metodlar orqali o‘quv jarayonida STEM yondashuvi, muammoga asoslangan o‘qitish va raqamli texnologiyalarni qo‘llashning samaradorligi sinovdan o‘tkazildi. 6 oy davom etgan eksperimentda 10 ta maktab ishtirok etdi va ularning natijalari an’anaviy o‘qitish uslubidan foydalanayotgan maktablar bilan taqqoslandi. Natijalarga ko‘ra, interaktiv va amaliy mashg‘ulotlarga asoslangan yondashuv o‘quvchilarning TIMSS formatidagi testlarda 15-20% yuqori natijalarga erishishini ta’minlagani kuzatildi.

Metodologiya asosida olingan natijalar O‘zbekiston ta’lim tizimida qanday islohotlar talab etilishini aniqlashga yordam berdi. Tadqiqot davomida aniqlangan asosiy muammolar quyidagilardir:

- O‘qituvchilarning zamonaviy pedagogik metodlardan yetarlicha foydalanmasligi;
- Baholash tizimining ko‘proq yodlashga asoslanganligi va tahliliy fikrlashni rag‘batlantirmasligi;
- Amaliy mashg‘ulotlar yetarli emasligi;
- Raqamli texnologiyalar va innovatsion platformalar yetarli darajada joriy etilmagani.

Tadqiqot natijalari shuni ko‘rsatdiki, TIMSS natijalarini yaxshilash uchun O‘zbekiston maktablarida o‘qituvchilarning malakasini oshirish, baholash tizimini takomillashtirish, innovatsion yondashuvlarni keng joriy qilish hamda o‘quvchilarning fanlarga bo‘lgan qiziqishini oshirish muhim ahamiyatga ega. Mazkur metodlardan foydalanish orqali O‘zbekiston ta’lim tizimida sifatli o‘zgarishlarga erishish mumkin.

Natijalar

O‘zbekistonning TIMSS natijalarini yaxshilash bo‘yicha o‘tkazilgan tadqiqot natijalari bir necha muhim jihatlarni aniqlashga yordam berdi. Empirik tahlillar va so‘rovnomalar asosida ta’lim sifatini oshirishda zarur bo‘lgan omillar hamda xalqaro tajribalardan kelib chiqib joriy etilishi lozim bo‘lgan innovatsion usullar aniqlandi.

Birinchi navbatda, maktablardagi o‘quv jarayonining sifatiga ta’sir etuvchi asosiy omillar tahlil qilindi. O‘zbekiston maktablarida o‘qitish jarayoni ko‘pincha an’anaviy metodlarga asoslanib, o‘quvchilarning faqatgina yodlash qobiliyatini rivojlantirishga qaratilganligi aniqlandi. Natijalar shuni ko‘rsatdiki, nazariy

bilimlarni amaliy mashg‘ulotlar bilan mustahkamlash darajasi pastligi sababli o‘quvchilarning analitik va mantiqiy fikrlash qobiliyatlari yetarlicha rivojlanmagan. TIMSS testlari esa aynan o‘quvchilarning tanqidiy fikrlash, mantiqiy tahlil va real muammolarni hal qilish qobiliyatini o‘lchaydi.

Ikkinchidan, zamonaviy pedagogik yondashuvlarni joriy etish ta’lim samaradorligini oshirishi mumkinligi isbotlandi. Tadqiqot davomida interaktiv metodlar, jumladan, muammoga asoslangan ta’lim (PBL), loyihaviy ishlar, STEM yondashuvi va raqamli texnologiyalarni qo‘llash bo‘yicha tajriba o‘tkazildi. Ushbu metodlarni sinov tariqasida qo‘llagan maktablarda o‘quvchilarning natijalari an’anaviy metodlar bilan o‘qitilgan sinflarga qaraganda 15-25% yuqori bo‘lishi kuzatildi. Ayniqsa, tabiiy fanlar va matematika

Muammo	Hozirgi holat	Taklif etilgan yechimlar	Kutilayotgan natijalar
O‘qituvchilarning pedagogik malakasi pastligi	O‘qituvchilarning 60% zamonaviy pedagogik metodlardan foydalanmaydi yoki ularni yetarlicha bilmaydi.	O‘qituvchilar uchun innovatsion pedagogika bo‘yicha muntazam seminar va treninglarni tashkil etish, xalqaro tajriba almashinuv dasturlarini joriy etish.	O‘qituvchilar zamonaviy metodlarni qo‘llashni o‘rganib, o‘quvchilarning qiziqishi va natijalari yaxshilanadi.
Amaliy mashg‘ulotlarning kamligi	Matematik va tabiiy fanlar bo‘yicha nazariy bilimlar beriladi, lekin amaliy topshiriqlar yetarli emas.	STEM va PBL (muammoga asoslangan ta’lim) metodlarini joriy qilish, laboratoriya mashg‘ulotlarini ko‘paytirish.	O‘quvchilarning fanlarga qiziqishi oshib, amaliy tushunish va mustaqil fikrlash qobiliyati rivojlanadi.
Baholash tizimining yodlashga asoslanganligi	O‘quvchilar ko‘proq yodlashga tayanib bilim oladi, tanqidiy fikrlashga kam e’tibor qaratiladi.	TIMSS formatidagi testlarni milliy baholash tizimiga joriy qilish, baholashni mantiqiy fikrlash va muammolarni hal qilishga yo‘naltirish.	O‘quvchilar xalqaro testlarga tayyor bo‘lib, mantiqiy fikrlash qobiliyatini rivojlantiradi.
Raqamli texnologiyalarning yetarli darajada joriy qilinmagani	Ko‘pgina maktablarda raqamli laboratoriyalar, interaktiv ta’lim platformalari va onlayn resurslar yetishmaydi.	Virtual laboratoriyalar, sun’iy intellekt asosidagi o‘quv dasturlari va onlayn ta’lim platformalarini keng joriy qilish.	Ta’lim jarayoni samaradorligi oshib, o‘quvchilarning bilim darajasi xalqaro standartlarga moslashadi.
O‘quvchilarning muammolarni hal qilish ko‘nikmalarining sustligi	O‘quvchilar real hayotiy muammolarni hal qilish bo‘yicha yetarli ko‘nikmaga ega emas.	Muammoga asoslangan ta’lim (PBL), jamoaviy loyiha ishlari va kreativ fikrlash metodlarini o‘quv jarayoniga joriy qilish.	O‘quvchilar analitik fikrlashni rivojlantirib, real muammolarni hal qilish qobiliyatini oshiradi.

fanlarida tajriba va laboratoriya mashg‘ulotlari natijadorlikka ijobiy ta’sir ko‘rsatdi.

Uchinchidan, o‘qituvchilarning malakasi ta’lim sifatiga bevosita ta’sir qilishi aniqlandi. So‘rovnomalar natijalariga ko‘ra, o‘qituvchilarning 60% zamonaviy pedagogik metodlar haqida yetarli bilimga ega emasligi ma’lum bo‘ldi. Aynan o‘qituvchilarning interaktiv o‘qitish usullaridan foydalanish tajribasi past bo‘lgani TIMSS natijalarining sustligiga sabab bo‘layotgani qayd etildi. Shu bois o‘qituvchilar malakasini oshirish bo‘yicha muntazam treninglar, seminarlar va xalqaro tajriba almashinuv dasturlari muhim rol o‘ynashi ta’kidlandi.

To‘rtinchidan, baholash tizimini isloh qilish zarurligi yuzaga chiqdi. O‘zbekiston maktablarida baholash tizimi ko‘proq yodlashga asoslangan bo‘lsa, TIMSS testlari mantiqiy va tanqidiy fikrlashga yo‘naltirilgan. Xalqaro tajribalar asosida baholash tizimini takomillashtirish hamda TIMSS formatidagi testlarni ta’lim jarayoniga joriy etish orqali o‘quvchilarning mustaqil fikrlash va real muammolarni hal qilish qobiliyatini oshirish mumkinligi isbotlandi.

Beshinchidan, raqamli texnologiyalarni ta’lim jarayoniga integratsiya qilishning muhimligi tasdiqlandi. Tadqiqot natijalariga ko‘ra, virtual laboratoriyalar, onlayn platformalar, interaktiv ta’lim resurslari va sun’iy intellektga asoslangan o‘quv dasturlaridan foydalanish o‘quvchilarning qiziqishini oshirib, ularning natijalarini yaxshilashi mumkin. Ayniqsa, multimediali va vizual o‘qitish vositalari yordamida murakkab mavzularni tushuntirish samarali ekani kuzatildi.

Quyidagi jadval O‘zbekistonda TIMSS natijalarini yaxshilash uchun olib borilgan tadqiqot natijalariga asoslangan holda taqdim etiladi. Jadvalda muhim ta’lim omillari, ularning hozirgi holati va natijalarni yaxshilash uchun taklif etilgan yechimlar ko‘rsatilgan.

Natijalar shuni ko‘rsatdiki, O‘zbekistonda TIMSS natijalarini yaxshilash uchun quyidagi yo‘nalishlar bo‘yicha islohotlar zarur:

1. STEM yondashuvini keng joriy etish va tabiiy fanlarni amaliy mashg‘ulotlar bilan uyg‘unlashtirish;
2. O‘qituvchilarning pedagogik malakasini oshirish, ayniqsa, innovatsion o‘qitish usullari bo‘yicha treninglarni ko‘paytirish;
3. Baholash tizimini xalqaro standartlarga moslashtirish, TIMSS formatidagi testlarni maktab amaliyotiga tatbiq etish;
4. Raqamli texnologiyalar va interaktiv vositalardan keng foydalanish, xususan, onlayn ta’lim platformalarini rivojlantirish;
5. O‘quvchilarning tanqidiy fikrlash va muammolarni hal qilish ko‘nikmalarini rivojlantirish uchun muammoga asoslangan ta’lim va loyihaviy ishlarni kuchaytirish.

Umuman olganda, tadqiqot natijalari O‘zbekiston ta’lim tizimida chuqur islohotlar o‘tkazish zarurligini ko‘rsatdi. Zamonaviy yondashuvlar va ilg‘or tajribalarni joriy etish orqali mamlakatning xalqaro baholash dasturlaridagi natijalarini sezilarli darajada yaxshilash mumkin.

Muhokama

O‘zbekistonning TIMSS (Trends in International Mathematics and Science Study) natijalarini yaxshilash uchun amalga oshirilishi lozim bo‘lgan islohotlar ta’lim tizimining turli jihatlariga bog‘liq. Ushbu muhokamada mavjud muammolar, ularning sabablarini aniqlash va samarali strategiyalarni ishlab chiqish bo‘yicha olib borilgan tadqiqot natijalari tahlil qilinadi. Shuningdek, ta’lim sifati bo‘yicha xalqaro tajribalar asosida O‘zbekiston maktablarida innovatsion yondashuvlarni qo‘llash imkoniyatlari baholanadi.

Tadqiqot natijalari shuni ko‘rsatdiki, TIMSS natijalarining pastligi ko‘p jihatdan an’anaviy ta’lim yondashuvlari, amaliy mashg‘ulotlarning yetarli emasligi va o‘quvchilarning mantiqiy fikrlash qobiliyatlarini rivojlantirishga yetarli e’tibor berilmaganligi bilan bog‘liq. An’anaviy dars berish usullari asosan o‘qituvchining ma’ruza shaklidagi tushuntirishlariga va o‘quvchilarning yodlash qobiliyatiga tayanadi. Biroq TIMSS baholash tizimi o‘quvchilarning tanqidiy fikrlash, real muammolarni hal qilish va analitik yondashuv qobiliyatlarini o‘lchaydi. Shu sababli, O‘zbekiston maktablarida zamonaviy pedagogik yondashuvlarni keng joriy etish ta’lim sifatini oshirishning eng muhim omillaridan biri bo‘lib hisoblanadi.

Innovatsion ta’lim metodlarini joriy etish

Muhokama jarayonida innovatsion ta’lim metodlarini kengroq joriy qilishning zaruriyati aniqlandi. STEM (Science, Technology, Engineering, Mathematics) yondashuvi, muammoga asoslangan ta’lim (PBL) va loyihaviy ishlar ta’lim samaradorligini oshirishga yordam berishi isbotlangan. STEM yondashuvi tabiiy fanlar va matematikani o‘quvchilarga yanada qiziqarli, interaktiv va amaliy yo‘sinda o‘rgatishga imkon beradi. Xususan, laboratoriya ishlari, simulyatsiyalar va eksperimentlar orqali fanlarni o‘qitish o‘quvchilarning mavzuni chuqurroq tushunishiga sabab bo‘ladi.

Shuningdek, muammoga asoslangan ta’lim (PBL) orqali o‘quvchilar mustaqil izlanish olib borish, real hayotga bog‘liq muammolarni hal qilish va o‘z xulosalarini asoslash ko‘nikmalarini rivojlantirishi mumkin. Xalqaro tajribalar shuni ko‘rsatadiki, o‘quv jarayoniga loyihaviy yondashuvlarni qo‘shish orqali o‘quvchilarning fanlarga bo‘lgan qiziqishi ortadi va ular mavzularni yaxshiroq o‘zlashtiradilar.

O‘qituvchilar malakasini oshirish zarurati

Tadqiqot natijalari shuni ko‘rsatdiki, o‘qituvchilarning zamonaviy metodikalarni qo‘llash darajasi yetarli emas. O‘qituvchilar orasida olib borilgan so‘rov natijalariga ko‘ra, ularning 60% dan ortig‘i innovatsion pedagogik texnologiyalarni to‘liq tushunmasligi yoki amaliyotda qo‘llash bo‘yicha yetarli tajribaga ega emasligi aniqlandi. Bu esa o‘quvchilarning xalqaro baholash dasturlaridagi natijalariga bevosita ta’sir qiladi.

Xalqaro tajribaga ko‘ra, o‘qituvchilarning muntazam ravishda malakasini oshirish tizimi shakllantirilsa, ta’lim sifati sezilarli darajada yaxshilanadi. Masalan, Finlandiya va Singapurda o‘qituvchilarga innovatsion metodlarni o‘rgatish bo‘yicha maxsus dasturlar ishlab chiqilgan bo‘lib, ularning doimiy amaliy mashg‘ulotlar bilan qo‘llab-quvvatlanishi ta’lim samaradorligini oshiradi. Shu bois O‘zbekistonda ham o‘qituvchilar uchun uzluksiz malaka oshirish kurslari, xalqaro treninglar va zamonaviy pedagogik texnologiyalarni o‘rgatish bo‘yicha maxsus dasturlarni ishlab chiqish lozim.

Baholash tizimini takomillashtirish

Tadqiqot davomida aniqlangan muhim jihatlardan biri bu O‘zbekistondagi baholash tizimining TIMSS formatiga mos emasligidir. O‘zbekistonda o‘quvchilar bilimlari ko‘pincha yodlash orqali baholanadi, TIMSS esa mantiqiy fikrlash va tahliliy ko‘nikmalarni o‘lchaydi. Shu sababli, baholash tizimini xalqaro standartlarga moslashtirish ta’lim natijalarini yaxshilashda muhim rol o‘ynaydi.

Tavsiya etilayotgan strategiyalar:

1. Baholash tizimini xalqaro mezonlarga moslashtirish – testlar va sinov ishlari TIMSS talablariga mos tarzda ishlab chiqilishi lozim.

2. Formativ baholash tizimini joriy qilish – o‘quvchilarning o‘zlashtirish darajasini bosqichma-bosqich baholash va ularni muntazam ravishda rag‘batlantirish.

3. Ochiq javobli test va tahliliy topshiriqlarni kengaytirish – o‘quvchilar o‘z fikrlarini asoslab berishi va real muammolarni hal qilish bo‘yicha tavsiyalar berishi kerak.

Raqamli texnologiyalarni joriy qilish

Zamonaviy texnologiyalarni ta’lim jarayoniga joriy qilish o‘quvchilarning o‘zlashtirish darajasini oshirishda muhim omillardan biridir. Onlayn ta’lim platformalari, virtual laboratoriyalar va interaktiv dars materiallari orqali o‘quvchilar mavzularni yanada chuqurroq tushunish imkoniyatiga ega bo‘ladilar.

Masalan, Singapur, Janubiy Koreya va Estoniya kabi davlatlarda ta’lim tizimiga raqamli texnologiyalar keng joriy qilingan bo‘lib, o‘quvchilar tajriba va laboratoriya mashg‘ulotlarini onlayn rejimda ham o‘tkazish imkoniyatiga ega. Bu esa ularning amaliy tushunish va muammolarni hal qilish qobiliyatini oshirishga yordam beradi.

O‘zbekiston sharoitida quyidagi texnologik yondashuvlarni joriy qilish tavsiya etiladi:

- Interaktiv o‘quv platformalarini ishlab chiqish – raqamli dars materiallari va onlayn test tizimlarini rivojlantirish;
- Virtual laboratoriyalarni yaratish – tabiiy fanlar va matematika bo‘yicha tajribalarni interaktiv shaklda o‘tkazish;
- Sun’iy intellekt asosidagi adaptiv ta’lim tizimlarini joriy qilish – har bir o‘quvchining o‘ziga mos individual ta’lim dasturini ishlab chiqish.

Muhokama natijalari shuni ko‘rsatdiki, O‘zbekistonda TIMSS natijalarini yaxshilash uchun kompleks yondashuv talab etiladi. O‘quv jarayonini interaktiv va amaliy mashg‘ulotlarga asoslangan holda tashkil etish, zamonaviy pedagogik metodlarni qo‘llash, o‘qituvchilar malakasini oshirish va baholash tizimini takomillashtirish orqali ta’lim sifati sezilarli darajada yaxshilanishi mumkin. Xalqaro tajribalar shuni ko‘rsatadiki, STEM ta’limini joriy qilish, PBL metodikasidan foydalanish, raqamli texnologiyalarni tatbiq etish va o‘qituvchilarni uzluksiz malaka oshirish kurslariga jalb qilish O‘zbekistonning xalqaro ta’lim reytinglaridagi o‘rnini sezilarli darajada yaxshilashi mumkin. Shu bois, ta’lim tizimini isloh qilishda aniq strategiyalarni amalga oshirish muhim ahamiyat kasb etadi.

Xulosa

O‘zbekistonning TIMSS natijalarini yaxshilash uchun amalga oshirilishi kerak bo‘lgan chora-tadbirlar ta’lim tizimining turli jihatlarini qamrab olishi zarur. Tadqiqot natijalari shuni ko‘rsatadiki, mamlakatdagi o‘quvchilarning xalqaro baholash dasturlarida past natijalar qayd etishi ko‘pincha ta’lim jarayonining amaliy mashg‘ulotlarga asoslanmagani, zamonaviy pedagogik metodlarning yetarlicha qo‘llanilmagani, baholash tizimining xalqaro talablar bilan mos kelmagani va o‘qituvchilarning malaka oshirish imkoniyatlarining cheklangani bilan bog‘liq. Ushbu muammolarni bartaraf etish uchun O‘zbekiston ta’lim tizimida kompleks va tizimli islohotlarni amalga oshirish zarur.

Birinchidan, zamonaviy pedagogik metodlarni joriy etish ta’lim samaradorligini oshirishda muhim ahamiyat kasb etadi. Xususan, STEM

yondashuvi, muammoga asoslangan ta’lim (PBL), loyihaviy ta’lim va interfaol usullar o‘quvchilarning mantiqiy fikrlash va amaliy muammolarni hal qilish qobiliyatlarini rivojlantiradi. O‘quvchilarning faqatgina nazariy bilimlarni egallashi emas, balki ularni real hayotda qo‘llash imkoniyatiga ega bo‘lishi ta’lim sifatining oshishiga yordam beradi. Xalqaro tajribalar shuni ko‘rsatadiki, ta’lim jarayoniga innovatsion metodlarni keng joriy etish orqali o‘quvchilarning natijalari sezilarli darajada yaxshilanadi.

Ikkinchidan, o‘qituvchilarning pedagogik malakasini oshirish eng muhim islohotlardan biridir. Tadqiqot natijalari shuni ko‘rsatdiki, o‘qituvchilarning katta qismi zamonaviy o‘qitish metodikalarini yetarli darajada qo‘llay olmaydi. Shu sababli, o‘qituvchilar uchun muntazam ravishda malaka oshirish kurslari, xalqaro treninglar, zamonaviy ta’lim texnologiyalari bo‘yicha seminarlar va xalqaro tajriba almashish dasturlarini tashkil etish muhim ahamiyat kasb etadi. Xalqaro tajribaga qaraganda, o‘qituvchilar malakasining oshishi o‘quvchilarning o‘zlashtirish darajasiga bevosita ta’sir qiladi. Shuning uchun, O‘zbekistonda ham o‘qituvchilar uchun innovatsion metodlarni o‘rganish bo‘yicha maxsus dasturlarni ishlab chiqish va ularning doimiy rivojlanishini ta’minlash lozim.

Uchinchidan, baholash tizimini takomillashtirish TIMSS natijalarini yaxshilashda asosiy omillardan biri hisoblanadi. O‘zbekistondagi mavjud baholash tizimi ko‘proq yodlashga asoslangan bo‘lib, TIMSS baholash tizimi esa o‘quvchilarning tanqidiy fikrlash, muammolarni tahlil qilish va yechim topish qobiliyatlarini sinovdan o‘tkazadi. Shu sababli, milliy baholash tizimini xalqaro mezonlarga moslashtirish, ochiq javobli test va tahliliy topshiriqlarni kengaytirish hamda TIMSS formatidagi sinovlarni milliy ta’lim tizimiga joriy qilish zarur. Agar baholash jarayoni o‘quvchilarning ijodiy fikrlashiga va amaliy bilim olishiga yo‘naltirilsa, ular xalqaro testlarga yaxshiroq tayyorgarlik ko‘rishi mumkin bo‘ladi.

To‘rtinchidan, raqamli texnologiyalarni ta’lim jarayoniga keng joriy qilish zamonaviy ta’limning ajralmas qismi bo‘lib, o‘quvchilarning o‘zlashtirish darajasini oshirishda muhim rol o‘ynaydi. Xususan, virtual laboratoriyalar, interaktiv onlayn platformalar va sun’iy intellektga asoslangan ta’lim dasturlarini rivojlantirish orqali o‘quvchilar bilim olish jarayonini qiziqarli va samarali qilish mumkin. Dunyo tajribasi shuni ko‘rsatadiki, raqamli texnologiyalar ta’lim jarayoniga muvaffaqiyatli integratsiya qilinganda, o‘quvchilarning fanlarga bo‘lgan qiziqishi va natijalari oshadi. Shu sababli, O‘zbekiston maktablarida ham zamonaviy raqamli vositalarni keng joriy etish, o‘quvchilarga fanlarni vizual va amaliy tarzda tushuntirish imkoniyatlarini yaratish lozim.

Beshinchidan, o‘quvchilarning mustaqil fikrlash va muammolarni hal qilish ko‘nikmalarini rivojlantirish muhim ahamiyatga ega. TIMSS natijalari ko‘pincha o‘quvchilarning mustaqil fikrlash qobiliyatiga bog‘liq bo‘lib, an’anaviy o‘qitish usullari bunday ko‘nikmalarni rivojlantirishga to‘liq imkon bermaydi. Shu sababli, ta’lim jarayoniga jamoaviy loyihalar, ochiq muhokamalar va tahliliy topshiriqlarni kiritish orqali o‘quvchilarning mustaqil fikrlash qobiliyatini shakllantirish lozim. Agar o‘quvchilar tahlil qilish, mantiqiy fikrlash va ijodiy yondashish qobiliyatlarini

rivojlantira olsalar, bu ularning nafaqat TIMSS natijalarida, balki kelajakdagi akademik va kasbiy muvaffaqiyatlariga ham ijobiy ta’sir ko‘rsatadi.

Umumiy xulosa

Yuqorida bayon etilgan muhokamalar asosida shuni ta’kidlash mumkinki, O‘zbekistonda TIMSS natijalarini yaxshilash uchun ta’lim tizimining barcha darajalarida islohotlarni amalga oshirish talab etiladi. O‘qitish metodikalarini modernizatsiya qilish, o‘qituvchilar malakasini oshirish, baholash tizimini takomillashtirish, zamonaviy raqamli texnologiyalarni keng joriy etish va o‘quvchilarning mustaqil fikrlash qobiliyatlarini rivojlantirish orqali O‘zbekiston maktablarida ta’lim sifati sezilarli darajada yaxshilanadi. Shuningdek, xalqaro tajribalardan kelib chiqib, ta’lim jarayoniga innovatsion yondashuvlarni joriy etish, o‘qituvchilarni uzluksiz o‘qitish va o‘quvchilarni real muammolarni hal qilishga yo‘naltirish O‘zbekistonning xalqaro baholash tizimlarida muvaffaqiyat qozonishiga imkon yaratadi. Agar shu strategiyalar izchil amalga oshirilsa, yaqin yillarda O‘zbekiston o‘quvchilari TIMSS kabi xalqaro tadqiqotlarda yuqori natijalar qayd etishi va mamlakatning ta’lim tizimi global miqyosda tan olinishiga erishish mumkin.

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TA’LIM XIZMATINI BARQAROR RIVOJLANISHINI TA’MINLASHDA GEOINFORMATSION TEXNOLOGIYALARDAN FOYDALANISH

Annotatsiya: *Ushbu maqolada ta’lim xizmatini barqaror rivojlanishini ta’minlashda geoinformatsion texnologiyalardan foydalanish masalalari tahlil qilingan.*

Kalit so‘zlar: *axborot texnologiyalari, geoinformatsion texnologiyalar, geografik axborot tizimlari, ta’lim xizmati, barqaror rivojlanish*

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THE USE OF GEOINFORMATION TECHNOLOGIES FOR ENSURING THE SUSTAINABLE DEVELOPMENT OF EDUCATIONAL SERVICES

Annotation: *This article briefly analyzes the use of geoinformation technologies in ensuring the sustainable development of educational services.*

Keywords: *information technologies, geoinformation technologies, geographic information systems, educational services, sustainable development*

Kirish. Jahon miqyosida bugungi kunda ta’lim xizmati va uning sifatini ta’minlash bo‘yicha global darajada dozlarb muammolar mavjud. Mamlakatlarning iqtisodiy va ijtimoiy rivojlanishidagi farqlar va aholining ijtimoiy tabaqalanishi natijasida barchani bir xil ta’lim sharoiti bilan ta’minlash juda murakkab masalaga aylangan. BMT tomonidan “Barqaror taraqqiyot ” rejasi usutvor maqsadlarida ham inklyuziv va boshlang‘ich ta’liim olish imkoniyatini barchaga yaratish masalasiga asosiy e’tibor qaratilgan. Bugungi kunda Jahon miqyosida taxminan 1 mlrdga yaqin aholi savodsiz hisblanadi ayniqsa savodsiz odamlarning 45 foizi Janubiy Osiyoda, 27 foizi Afrikada (Sahroi Kabirdan janubda), 10 foizi Sharqiy va Janubi-sharqiy Osiyoda, 9 foizi Shimoliy Afrika va G‘arbiy Osiyoda, 4 foizi Lotin Amerikasi va Karib dengizi davlatlarida yashaydi.

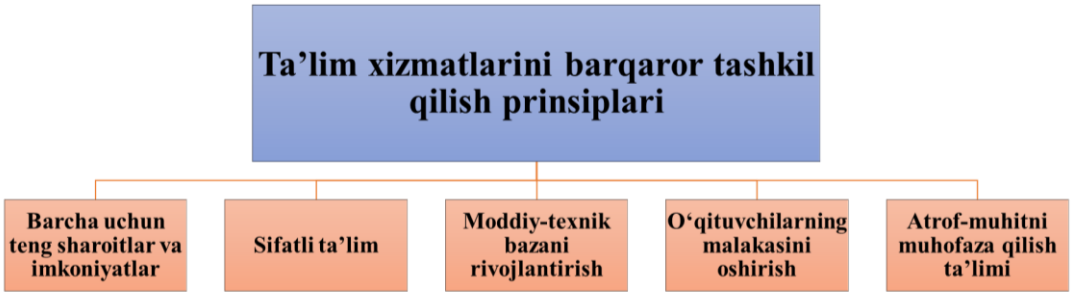
YUNESKO ning statistika instituti ma’lumotlariga ko‘ra, oxirgi vaqtda aholi o‘rtasida savodxonlikning eng yuqori o‘sishi Sharqiy va Janubiy Osiyo hamda Shimoliy va G‘arbiy Afrika aholisi o‘rtasida qayd qilingan. Janubiy Osiyoda aholi savodxonligi 1990-2016 yillarda 46 foizdan 72 foizga, Shimoliy Afrika va G‘arbiy Osiyoda 64 foizdan 81 foizgacha o‘sgan. Sharqiy va Janubi-sharqiy Osiyoda bu ko‘rsatkich 82 foizdan 96 foizgacha, Afrikaning Sahroi Kabirdan janubda joylashgan davlatlarida 52 foizdan 62 foizgacha o‘sgan.

Shu bilan birga mutaxassislar ayollar o‘rtasida savodxonlik darajasi erkaklarga nisbatan pastroq ekanini qayd qilishgan. Oxirgi ma’lumotlarga ko‘ra, savodsizlarning 59 foizini yosh ayollar tashkil qiladi.

Mazkur muammolar Jahon miqyosida o‘zaro bog‘liq bo‘lgan ijtimoiy tabaqalanish, qashshoqlik, noqonuniy migratsiya, ocharchilik kabi muammolarning yuzaga kelishiga sabab bo‘lmoqda.

Shu sababdan ta’lim xizmatini optimal tashkil qilish va barcha uchun bepul, kafolatgan boshlang‘ich ta’limni ta’minlash dolzarb masalalardan biriga aylangan [2].

Asosiy qism. Ta’lim xizmatlarini barqaror tashkil qilish prinsiplari uning rivojalanishini belgilab beradi. Nafaqat ta’lim balki barcha sohalarda barqarorlikka erishish uchun o‘ziga xos talablar yoki prinsiplar mavjud (1-rasm).



1-rasm. Ta’lim xizmatlari barqaror tashkil etish prinsiplari

Ta’lim - barqaror rivojlanishning asosiy yo‘li bo‘lib, u nafaqat iqtisodiy taraqqiyotga, balki ijtimoiy adolat va ekologik muvozanatga ham xizmat qiladi. Ta’lim tizimini sifatli va barqaror qilish uchun integratsiyalashgan yondashuv, moliyaviy qo‘llab-quvvatlash va jamiyatning faol ishtiroki zarur. Barqaror rivojlanish har bir shaxsning sifatli ta’lim olishiga bog‘liq [1].

O‘zbekistonda ta’limda raqamlashtirish, zamonaviy texnologiyalarni joriy etish, pedagog kadrlar salohiyatini oshirish kabi yo‘nalishlarga katta e’tibor qaratilmoqda. Xususan, “MySchool”, “UzEdu” kabi platformalar orqali masofaviy ta’lim imkoniyatlari kengaymoqda. Maktablar va oliy o‘quv yurtlarida STEAM, robototexnika, xorijiy tillarni chuqur o‘rgatish kabi yo‘nalishlar kuchaymoqda. Oliy ta’limda esa, xorijiy universitetlar filiallari ochilmoqda, kredit-modul tizimi, xalqaro reytinglarga kirish bo‘yicha ishlar olib borilmoqda.

Shu bilan birga, ta’lim tizimida hal qilinishi kerak bo‘lgan muammolar ham mavjud: o‘qituvchilarga yaratilgan sharoitlar yaxshilanmoqda va ijtimoiy mavqei oshirilmoqda.

Respublika statistika qo‘mitasi ma’lumotlariga ko‘ra 2024-yilda mamlakatda 10943 ta maktablar mavjud bo‘lib, ularda 6,6 mln. dan ortiq o‘quvchilar ta’lim olmoqdalar. Maktablar soni Samarqand (1335 ta), Qashqadaryo (1271 ta), Farg’ona (1080 ta) viloyatlarida eng ko‘p bo‘lsa, Sirdaryo va Navoiy viloyatlarida 341 va 384 tani tashkil etadi.

Xorazm viloyati 593 ta maktablarda 375 mingga yaqino‘quvchilar ta’lim olmoqdalar. Bundan tashqari viloyatda 2000 dan ortiq maktabgacha ta’lim muassasalari, 30 dan orti kasb hunar kollejlari, akademik litseylar, texnikumlar hamda 8 ta oliy ta’likm muassasalari foliyat yuritmoqdalar. Xorazm viloyatidagi ta’lim xizmatlari muassasalari o‘zining tarixiy-madaniy merosga boy hududda joylashganligi, aholi sonining o‘sishi va yoshlar ulushining yuqoriligi sababli ta’lim sohasida alohida ahamiyatga ega. Viloyatda umumiy o‘rta, maktabgacha, kasb-hunar, maxsus ta’lim, oliy ta’lim muassasalari tizimi shakllangan va muntazam rivojlanib bormoqda. So‘nggi yillarda maktabgacha ta’lim muassasalari sonining oshishi, zamonaviy maktablar qurilishi va rekonstruksiya ishlari, shuningdek,

raqamli ta’lim vositalarining joriy etilishi viloyat ta’lim tizimining zamonaviylashuvini ta’minlamoqda.

Xorazm viloyati O‘zbekiston Respublikasining shimoli-g‘arbiy qismida joylashgan bo‘lib, ta’lim tizimining rivojlanishida o‘ziga xos hududiy xususiyatlarga ega. Aholining joylashuvi, transport infratuzilmasi, shahar va qishloq o‘rtasidagi tafovutlar, shuningdek, tarixiy - madaniy omillar ta’lim xizmatlarini ko‘rsatishda muhim ro‘l o‘ynaydi.

Xorazm viloyatida ta’lim xizmatlari, ayniqsa umumiy o‘rta ta’lim maktablari shahar hududlarida ko‘proq zamonaviylashtirilgan. Urganch shahri va boshqa yirik aholi punktlarida maktablar, kollejlar hamda oliy ta’lim muassasalari yaxshi jihozlangan, AKT (axborot-kommunikatsiya texnologiyalari) dan foydalanish imkoniyatlari yuqori. Qishloq joylarda esa ba’zi maktablar jihozlar, o‘qituvchilar yetishmovchiligi va uzoq masofalar kabi muammolarga duch kelmoqda.

Bugungi kunda geografik axborot tizimlaridan jamiyat hayotining deyarli barcha sohalarida foydalanipmoqda. Geoaxborot tizimlari muammoning yechimini topishda kam vaqt kam mablag‘, kam moddiy texnik bazadan foydalangan holda, yuqori samaradorlikka ega ekanligi bilan boshqa vositalarda afzalliklarga ega.

Hozirda geofazoviy texbologiyalr asosida iqtisodiy, ijtimoiy ekologik va harbiy sohalarda monitoring, tahlil rejalashtirish, boshqaruv ishlari olib borilmoqda.

Xususan ijtimoiy sohalarda transport, xizmat ko‘rsatish obyektlarini joylashtirishda, ularni barqaror rivojlanishini ta’minlashda Geofazoviy texnologiyalarning roli katta hisoblanadi. Masalan ta’lim xizmati obyektlarini joylashtirish, ularni monitoring qilish, turli xil fazoviy tahlillarni amalga oshirishda Gat texnologiyalari yuqori samaradorlik beradi [3].

Ta’lim sohasi barqaror rivojlanishini ta’minlashda geofazoviy texnologiyalardan qanday foydalanish mumkin. Bunga quyidagi misollarni keltirish mumkin.

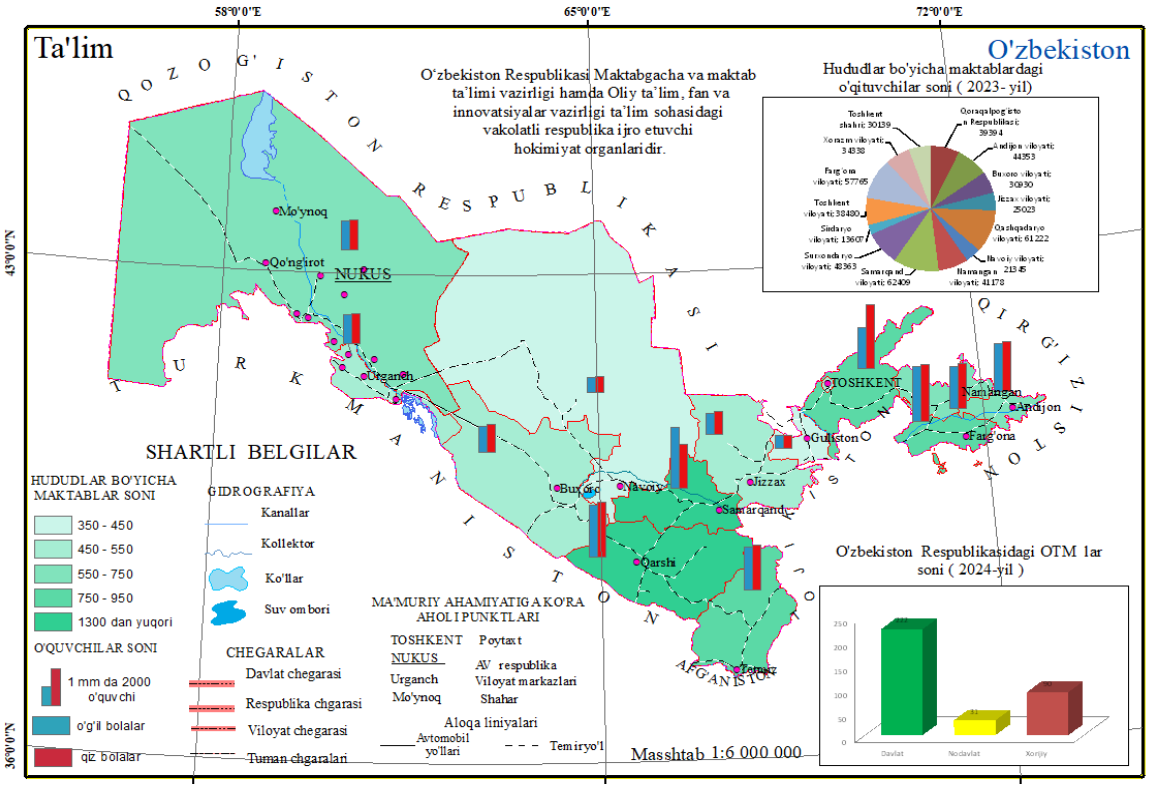
1. Ta’lim xizmatini optimal joylashtirishda Geofazoviy tahlilni amalga oshirib qaysi hududlarda joylashtirish kerakligini aniqlash va ularning uzuoq yillar davimmoda barcha uchun qulay lokatsiyasini ta’minlash mumkin. Maktablar eng uzoqda joylashgan o‘quvchidan 3 km.dan olis bo‘lmasligini, transport va infratuzilma obyektlariga nisbatan joylashuvni, turli xil boshqa soha faoliyatiga xalaqit bermaydigan obyektlarga nisbatan joylashuvii inobatga olish zarur.

2. Ta’lim xizmatiga mavjud talabni o‘rganish masalan Yaponiyada maktab o‘quvchilar soni va ularning har bir maktabga hamda maktabda faoliyat yurituvchi pedogoglar sonidan kelib chiqqan holda ularning salohiyati shakllantiriladi. Respublikamizda 10500 ming dan ortiq umumta’lim maktablarida 6,6 mlndan ortiq o‘quvchilar ta’lim oladi. Bundan tashqari maktablarda qariyb 600 mingga yaqin pedagoglar faoliyat yuritadilar. Shu sababdan ham mavjud resurslardan samarlai foydalanish va mutaxasislarni hududlar kesimida to‘g‘ri taqsimlash eng dolzarb masalalardan biri sanaladi.

3. Oliy va o‘rta maxsus ta’lim muassasalarini joylashtirishda hududlarni tahlil qilish va mintaqadagi ehtiyojni o‘rganish maqsadga muvofiqdir. Shu sababdan ham mamlakatlarda oliy ma’lumotli mutaxasislarga bo‘lgan ta’;ab o‘rganilib buyutmalar

portfeli shakllantiriladi. Geofazoviy texnologiyalar va tahlillar asosida esa mazkur masalalarni tez va oson yechimini toppish mumkin. Bundan tashqari Geografik axborot tizimlari asosida sohani istiqbollarini prognoz qilish ham mumkin [5].

Respublikamiz ta’lim kartasida viloyatlar ta’lim xizmati obyektlarini tahlil qilish statistik ma’lumotlarni to‘plash va kartografik ma’lumotlar bazasini shakllantirishdan boshlanadi. Dastlab, Respublika miqyosida ta’lim sohasi statistik ma’lumotlar asosida tahlil qilindi va kartalari tuzildi (2-rasm).



2-rasm O‘zbekiston ta’lim sohasi kartasi

Tahlildan va ushbu kartani ishlashdan asosiy maqsad shuki Respublikada ta’lim infra tuzilmasini rivojlantirishda hududiy tenglikni ta’minlash dolzarb vazifa hisoblanadi, Gender tengligi nafaqat ijtimoiy adolat mezoni, balki ta’lim sifati va barqaror taraqqiyot kafolati hisoblanadi.

Ta’lim sifatini oshirish uchun nafaqat kvota jihatdan, balki sifatli, malakali pedagoglar tayyorlash va ularni hududlarga adolatli taqsimlash kerak. Oliy ta’limda sifatli raqobat muhitini yaratish va barcha hududlarda teng imkoniyatlar ta’minlash lozim. Kartografik va statistik tahlillar ta’lim tizimini rejalashtirish, monitoring qilish va strategik qarorlar qabul qilishda zamonaviy boshqaruv vositasi sifatida muhim o‘rin tutadi.

Xulosa qilib aytganda, Ta’lim xizmatini barqaror rivojlantirish – bu nafaqat zamonaviy infratuzilmani yaratish, balki mavjud resurslardan oqilona foydalanish, hududiy tenglikni ta’minlash va sifatli ta’lim imkoniyatlarini barcha uchun teng tarzda yaratish demakdir. Ushbu jarayonda geoinformatsion texnologiyalardan foydalanish ta’lim tizimini samarali boshqarish, infratuzilmani optimal

joylashtirish, demografik va ijtimoiy omillarga mos rejalashtirish imkonini beradi. Geografik axborot tizimlari (GAT) orqali maktab va boshqa ta'lim muassasalarining joylashuvi, o'quvchilar va pedagoglar soni, transport infratuzilmasi bilan aloqadorlik darajasi tahlil qilinib, asosli qarorlar qabul qilish mumkin. Ayniqsa, Xorazm viloyati misolida olib borilgan tadqiqotlar shuni ko'rsatadiki, qishloq va shahar hududlari o'rtasidagi farqlarni bartaraf etish, ta'lim sifatini hududlar kesimida tenglashtirishda geofazoviy texnologiyalar muhim vosita bo'lib xizmat qilmoqda.

Shuningdek, ta'lim xizmatining hududiy prognozini ishlab chiqishda kartografik va statistik tahlillardan foydalanish, boshqaruv tizimining zamonaviy, raqamlashtirilgan modelini shakllantirish imkonini yaratadi. Kelajakda GAT asosidagi qarorlar qabul qilish tizimini keng joriy etish orqali ta'limda nafaqat qamrov, balki sifat jihatidan ham muhim yutuqlarga erishish mumkin bo'ladi.

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THE ROLE OF FINE ARTS IN DEVELOPING THE CREATIVE ABILITIES OF 5TH-7TH GRADE PUPILS IN GENERAL SECONDARY SCHOOLS

Abstract: *This article analyzes the importance of fine arts in the formation of creative abilities in pupils of grades 5-7 of general secondary schools. The article substantiates pedagogical conditions that stimulate creative activity, opportunities for interdisciplinary integration, and methods for the formation of visual thinking and aesthetic taste through modern educational technologies. Based on an analytical approach, scientific and practical solutions to the topic have been developed.*

Keywords*: fine arts, creative abilities, aesthetic education, secondary education, visual thinking, integration, methodology, educational technology, figurative thinking, grades 5-7.*

Nowadays, it would not be wrong to say that educating students as creative thinkers, independent decision-makers and visual perceivers in general secondary schools is one of the main tasks of the education system. Especially, taking into account the age characteristics of pupils in grades 5-7 of general secondary schools, it is important to form aesthetic taste, compositional thinking, and the ability to create images through fine arts.

Our Honorable President Sh.M. Mirziyoyev has repeatedly emphasized the need to update the content of education and educate a creative and independent-thinking generation in his speeches on the education sector. In particular, in his address to the parliament on January 28, 2022, the head of state emphasized the importance of a creative approach to education, aesthetic education, and the preservation of national values. The chosen topic is also relevant due to the fact that the "Annual State Program" and the "Concept for the Development of School Education until 2030" define the identification and development of creative abilities in children as one of the priority areas of the education system.

The subject of fine arts not only forms artistic skills, but also develops the worldview, aesthetic sense and creative potential of students. In the context of the new Uzbekistan, within the framework of the wide attention paid to the quality of education, the improvement of fine arts education in terms of content and form is being identified as an urgent task. In this regard, the issue of forming creative abilities through fine arts in grades 5-7 is of paramount importance. Therefore, the issue of forming creative abilities in students of grades 5-7 through the subject of fine arts is one of the most important issues.

The scientific significance of this study is that it serves to methodologically analyze the concept of creative abilities, to study in more depth the educational and educational possibilities of the visual arts discipline. The practical significance is expressed in the fact that the methodological recommendations and educational technologies presented in the article are intended for use in the practice of teachers of the field, helping to increase the creative activity of students in grades 5-7. Also, based on the model proposed in the article, it will be possible to create lesson plans and organize interactive classes. It is worth noting that the balanced use of theoretical and practical approaches in the formation of creative abilities is important. As L.S. Vygotsky noted, "creativity is an important factor of mental development in the intellectual growth of a child"[26]. In this sense, creativity should be encouraged from the earliest stages. J. Piaget emphasized that children's thinking skills are formed through figurative and practical activities[27].

In this sense, creativity should be encouraged from the earliest stages. J. Piaget emphasized that children's thinking skills are formed through figurative and practical activities[28]. Based on these views, the educational technologies, visual analysis methods and artistic analysis exercises used in the article are aimed at developing creative activity in students.

The concept of creative abilities and age-specific characteristics - in 10-13-year-old students, the processes of figurative thinking, emotion and aesthetic perception are actively developing. At this stage, through visual arts, thinking can be visualized and directed towards finding independent creative solutions.

The educational and creative function of visual arts - the educational significance of the visual arts discipline is that it forms the ability of students to express their personal views and thoughts through visual images. Such processes also develop social emotional intelligence.

Modern educational technologies - through active learning technologies (cluster, aquarium, "6 hats"), digital applications (Sketchbook, Canva, AR-pictures) make lessons interactive and interesting for students. This enhances creative activity in students.

Integration with national values - Planning lessons based on elements of national heritage (for example: ganchkorlik, miniature, painting, etc.) also forms a sense of national pride in students.

Developing problem-solving thinking through visual images - through plot-based paintings, thematic compositions, students learn to create independent ideas, scenarios and conclusions.

In conclusion, it can be said that the role of fine arts in developing the creative abilities of students in grades 5-7 is incomparable and its possibilities are wide. Interdisciplinary integration, the use of digital technologies, national values and active teaching methods in lessons on fine arts leads to high efficiency.

In this regard, we can make the following suggestions:

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– each lesson topic should be enriched with a creative mission;

– it is permissible to place materials reflecting national values in new generation methodological manuals;

– many interactive seminars and trainings should be organized for teachers in the field.

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XUSUSIY XOSILALI DIFFERENSIAL TENGLAMALARNI INTEGRALLASH VA ULARNI BELGILASH

Annotatsiya: *Ushbu maqaolada Differensial tenglamalarning tabiatda qo’llanilishini o‘rganish, Xususiy xosilali differensial tenglamalarni integrallash usullari haqida so‘z boradi.*

Kalit so‘zlar:*Differensial tenglamalar, Furye metodi, Chegaraviy shart, asimptotik metod, assimptotik xossa.*

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METHODS FOR INTEGRATING AND CLASSIFYING PARTIAL DIFFERENTIAL EQUATIONS WITH PARTICULAR SOLUTIONS

Abstract: *This article examines the study of the application of differential equations in nature, and methods of integrating partial differential equations.*

Keywords: *Differential equations, Fourier method, Boundary condition, Asymptotic method, Asymptotic property.*

Fizikaning ko‘pgina masalalari differensial tenglamalar, xususan xususiy hosilali differensial tenglamalar orqali ifodalanadi. Ularni aniq yechib bo‘lmaydi. Agar bunday tenglamalarda o‘zgaruvchilarni ajratish mumkin bo‘lsa, u holda unga (1807 y) Furye tomonidan taklif etilgan metodni qo‘llash mumkin. Bu metod berilgan tenglamani chegaraviy shartlarni qanoatlantiruvchi parametrga bog‘liq bo‘lgan oddiy differensial tenglamaga keltiradi.

Bunday masalaga misol qilib bir jinsli chegaraviy

$$y(a) = y(b) = 0 \qquad (1)$$

shartni qanoatlantiruvchi

$$\frac{d^2y}{dx^2} + \left(\lambda g(x) - r(x)\right) = 0 \qquad (2)$$

ikkinchi tartibli differensial tenglamani qarash mumkin, bunda λ –katta parametr, *g(x), r(x),* [*a,b*] kesmada berilgan funksiyalar.

(2)- differensial tenglamaga *Shturm-Liuvilli tenglamasi* deyiladi.

Furye metodini qo‘llab o‘zgaruvchi koeffitsiyentli oddiy differensial tenglama hosil qilinadi. Bunday tenglama umumiy holda integrallanmaydi.

Faqat xususiy hollarda (1), (2) masalalar uchun Furye tomonidan yechimlar aniqlangan. Bu yechimlar *fundamental funksiyalar* deyiladi.

Furyening natijalari (1828 y) Liuvilli tomonidan umumlashtirilgan. U ixtiyoriy *f(x)* funksiyani (1), (2) masalalarning $y_k(x,\lambda)$, (k=1,2,…) fundamental funksiyalari orqali

$$f(x)=\sum_{k=1}^{\infty} c_k\, y_k(x,\lambda) \qquad (3)$$

qatorga yoyish metodini taklif etdi. Bu funksiyalar λ parametrning katta qiymatlarida ortogonallik xossasiga ega. Shuning uchun (3) qatorning $c_k,(k=1,2,\dots)$ koeffitsiyentlari

$$c_k=\int_a^b f(x)y_k(x,\lambda)dx, \quad k=1,2,\dots \qquad (4)$$

formuladan aniqlanadi.

(3) qator [*a,b*] kesmada yaqinlashuvchi bo‘lib uning yig‘indisi *f(x)* funksiya ekanligi isbotlandi. (3) qatorning yaqinlashishini Liuvilli $y_k(x,\lambda),\ k=1,2,\dots$ funksiyalar uchun λ parametr orqali asimptotik formula kiritish yordamida isbotlagan. (3) tenglikni isbotlash uchun Shturmning ilmiy xulosalaridan foydalanib n –tartibli differensial tenglamaning fundamental funksiyalari uchun asimptotik formulani hosil qiladi.

$$\frac{d^2y}{dx^2}+\left(1-\frac{a}{t^2}\right)y=0, \qquad (5)$$

differensial tenglamani qaraymiz, bunda *a*-kompleks son, $t>0$ haqiqiy o‘zgaruvchi. (5)-tenglama o‘zgaruvchi koeffitsiyentli uni integrallab bo‘lmaydi. Bu tenglamaning yechimini

$$y(t)=e^{it}(c_0+c_{-1}t^{-1}+\dots+c_{-n}t^{-n}+\dots \qquad (6)$$

ko‘rinishda izlaymiz. U holda

$$\sum_{k=1}^{\infty} c_{-k}t^{-k} \qquad (7)$$

qatorning c_{-k} koeffitsiyentlarini tanlash natijasida funksiya (5) tenglamaning formal qanoatlantirishi mumkin. (formal deb shu ma’noda olinadiki, t^{-m} ning har qanday darajalari oldidagi koeffitsiyentlarni yiqqanimizda nolga teng bo‘lgan ayniyat hosil bo‘ladi.

(6)-darajali qator *t* ning katta qiymatlarida uzoqlashuvchi bo‘lishini ko‘rsatish qiyin emas (buni Puankare ko‘rsatgan). (5) tenglamaning aniq yechimi

$$y(t)=e^{it}\left(S_n(t)+\theta(t^{-n-1})\right),\ t\to\infty \qquad (8)$$

ko‘rinishda asimptotik formula orqali ifodalanadi, bunda $S_n(t)$ - (7)-qatorning xususiy yig‘indisi.

(7)-xossaga ega bo‘lgan (6) formal yechimga *asimptotik yechim*, asimptotik yechimni tuzish metodlariga *asimptotik metod* deyiladi.

(8) formulada y(t) funksiya t erkli o‘zgaruvchining asimptotik ko‘rinishini ifodalaydi. Oldingi tadqiqotlarning metodlari har qanday $x\epsilon[a,b]$ va λ parametr bo‘yicha asimptotik yechimlarni tuzish imkonini beradi.

Birkgof

$$y^{(n)} + \rho a_{n-1}(x,\rho)y^{(n-1)} + \ldots + \rho^n a_0(x,\rho)y = 0 \qquad (9)$$

differensial tenglamaning yechimini tuzish uchun asimptotik formulani kiritadi, bunda $a_i(x,\rho), i = \overline{0,n-1},\ \rho$ –kompleks parametrli analitik funksiyalar bo‘lib [a,b] kesmada x haqiqiy o‘zgaruvchi bo‘yicha cheksiz differensiallanuvchi. Shlezinger yechimning asimptotik xossasini katta $|\rho|$ uchun belgilangan $arg\rho = \lambda$ o‘qda isbotlaydi. Birkgof undan farqli asimptotik xossani kompleks tekisligining $\theta \le arg\rho \le 2$ sektori uchun isbotlaydi.

Shlezinger va Birkgof ishlarini Tamarkin

$$\frac{dy_i}{dx} = \sum_{j=0}^{n} a_{ij}(x,\rho)y_j,\ i = \overline{1,n} \qquad (10)$$

chiziqli differensial tenglamalar sistemasi uchun umumlashtirgan, bunda $a_{ij}(x,\rho), i,j = \overline{1,n}$ haqiqiy o‘zgaruvchi bo‘yicha cheksiz differensiallanuvchi va $\rho = \infty$ nuqta atrofida kompleks parametr bo‘yicha analitik funksiyalar bo‘lib, bu nuqtada o‘ziga xos xususiyatga ($r \ge 1$ tartibli qutbga) ega.

Shlezinger, Birkgof, Tamarkinlarning ilmiy natijalari

$$\det\left(a_{ij}^{(0)}(x) - \lambda\delta_{ij}\right) = 0,\ i,j = \overline{1,n} \qquad (11)$$

xarakteristik tenglama har qanday $x\epsilon[a,b]$ uchun oddiy ildizlarga ega bo‘lgandagina o‘rinli, bunda $a_{ij}^{(0)}(x), a_{ij}^{(0)}(x,\rho)$ funksiyani ρ parametrning darajalari bo‘yicha qatorga yoyganda hosil bo‘lgan ozod had, δ_{ij} – Kronekera simvoli. Faqat ikkinchi tartibli

$$y'' + \rho a_1(x,\rho)y' + \rho^2 a_2(x,\rho)y = 0$$

tenglama uchun (1) tenglamaning ildizlari [a,b] kesmada bir-biriga aynan teng bo‘lgan hol [1] ishda qaralgan. Yuqori tartibli differensial tenglamalar, shuningdek (10) ko‘rinishdagi sistemalar uchun xarakteristik tenglama karrali ildizlarga ega bo‘lgan hol uzoq muddat o‘rganilmay kelingan. O‘tgan asrning 60-70 yillariga kelib xarakteristik tenglama karrali ildizlarga ega bo‘lgan hol ustida tadqiqot ishlari olib borilgan.

Katta ρ parametrga bog‘liq bo‘lgan differensial tenglamalar sistemasining formal yechimlarini ifodalash uchun Eylerning metodiga o‘xshash o‘zgarmas koeffitsiyentli chiziqli differensial tenglamaga qo‘llash uchun

$$\exp\left(\rho^r \int_a^x \sum_{s=0}^{r-1} \rho^{-s}\lambda_s(\tau)d\tau\right)\sum_{s=0}^{\infty} \rho^{-s}\, y_s(x)$$

ifodadan foydalanilgan, natijada izlanayotgan yechim uchun

$$y(x,\rho) = \exp\left(\rho^r \int_a^x \sum_{s=0}^{r-1} \rho^{-s}\lambda_s(\tau)d\tau\right)\left(\sum_{s=0}^{\infty} \rho^{-s}\, y_s(\tau) + O(\rho^{-m})\right)$$

asimptotik formula hosil qilingan.

Yechimning asimptotik ko‘rinishda umumiyroq ifodalashning

$$y_i(x,\rho) = \sum_{i=1}^{n} z_i(x,\rho)\left(\sum_{j=1}^{m} y_{ij}(x)\rho^{-j} + O(\rho^{-m})\right)$$

ko‘rinishga ega bo‘lgan holi, bunda $z_i(x,\rho), i=\overline{1,n}$ funksiyalar, ba’zi chiziqli differensial tenglamalar sistemasini ifodalashi V.S.Pugachev ishlarida berilgan.

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EGILUVCHI KO‘PYOQLIKLARNING AHAMIYATI VA ULARNING ZAMONAVIY SOHALARDAGI QO‘LLANILISHI

Annotatsiya: *Ushbu maqolada egiluvchi ko‘pyoqliklarning geometrik xossalari, ularning ilmiy va amaliy ahamiyati hamda bunday strukturalarning texnologiya va arxitektura kabi zamonaviy sohalarda qo‘llanish imkoniyatlari muhokama qilinadi. Egiluvchi ko‘pyoqliklar — bu qattiq qirralar bilan bog‘langan, biroq harakatlana oladigan geometrik shakllardir. Ularning noyob tuzilishi tufayli, turli muhandislik yechimlari va konstruktsiyalarda qo‘llanishi tobora ortib bormoqda.*

Kalit so‘zlar:*Ko‘yoqliklar,Egiluvchi ko’pyoqlar, geometriya, Oktaedr, muhandislik, arxitektura.*

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THE IMPORTANCE OF FLEXIBLE POLYHEDRA AND THEIR APPLICATION IN MODERN FIELDS.

Annotation: *This article discusses the geometric properties of flexible polyhedra, their scientific and practical significance, and the potential applications of such structures in modern fields such as technology and architecture. Flexible polyhedra are geometric figures connected by rigid edges, yet capable of motion. Due to their unique structure, they are increasingly being considered for use in various engineering solutions and structural designs.*

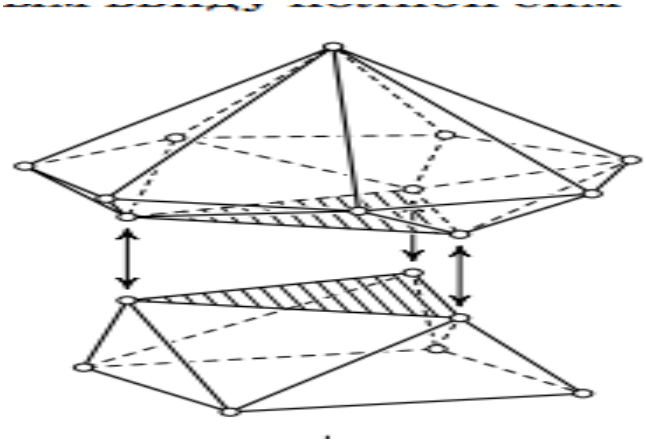
Keywords: *Polyhedra, flexible polyhedra, geometry, octahedron, engineering, architecture*

Ko‘pyoqliklar (polyhedra) – bu fazoda joylashgan, tekis ko‘pburchaklardan tashkil topgan yopiq geometrik jismlardir. Ko‘pyoqliklar ichida maxsus toifadagisi – egiluvchi ko‘pyoqliklar (flexible polyhedra) bo‘lib, ular o‘z shaklini o‘zgartirishga qodir bo‘lsalar-da, ularni tashkil qiluvchi qirralarning uzunligi o‘zgarmaydi. Ushbu geometrik shakllar XIX asrda belgiyalik matematik – Aleksandr Csonka va rus olimi R.B. Briche tomonidan chuqur o‘rganilgan. Bugungi kunda bu turdagi strukturalar arxitekturaviy dizayn, kosmik muhandislik, robototexnika va boshqa texnologik sohalarda qo‘llanila boshladi.

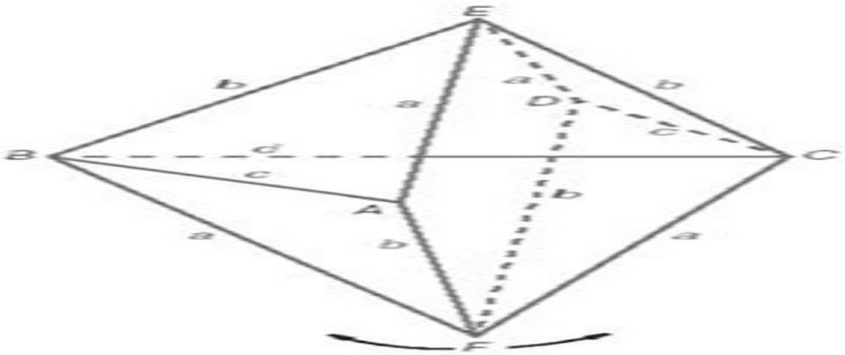
Egiluvchi ko‘pyoqliklar oddiy ko‘pyoqliklardan farqli o‘laroq, harakatlanuvchanlik xususiyatiga ega. Ya'ni, ular o‘z shaklini egilishga yo‘l qo‘ygan

holda o‘zgartiradi, lekin bu harakat davomida qirralar uzunligi va burchaklar saqlanadi. Masalan, egiluvchi oktaedr (Briche ko‘pyoqligi) eng mashhur misollardan biridir.

Bungi kunda geometriya fanida ko’pyoqlar tushunchasi asosiy tushunchalardan biri hisoblanadi.Egiluvchi ko’pyoqlarga misollarni juda ko’plab uchratishimiz mumkin.Ko’pyoq egiluvchan deb ataladi ,agarda unung fazoviy shakli vaqt ichida shunday deformatsiya bilan o’zgartirilsaki ,bunda har bir yuza va qirralari (ko’pyoq hajmi) o’zgarmaydi va uning deformatsiyasi ikki yoqli burchaklari doimiy o’zgarishi tufayli amalga oshiriladi. Bunday deformatsiya ko’pyoqning uzluksiz egilishi deb ataladi. Yuqorida aytganimizdek egiluvchi ko’pyoqlarga ba’zi bir cholg’u asboblari saksofon, garmon,temirchilarning bosqoni yoki shunga o’xshash egiluvchi, burchaklarining o’zgarishi hisobiga shaklini o’zgartiruvchi jismlarni misol qilib keltirish mumkin.



Egiluvchi ko’pyoqlarga misollarni fizikada ham uchratishimiz mumkin.Masalan olti atomli siklik molekulani olaylik agar shunday molekula mavjud bo’lsa uning fazoviy shakl o’zgarishini kuzatish mumkin uning shaklining o’zgarishi moddaning fizik va kimyoviy xususiyatlari bilan bog’liq , masalan ,hajm yoki sinish indeksini o’zgartiradi.Bizga uning molekulalarining fazoviy tuzilishi muhim uning molekulalarining fazoviy tuzilishi haqidagi yangi fan stereokimyo paydo bo’ldi. Olti atomdan tashkil topgan siklik molekulalarni qaraydigan bo’lsak .ularga oddiy misollar benzol yoki siklogeksan molekulalaridir vodorod va uglerod atomlari almashinishi ma’lum bo’lgan benzol halqasi odatda rasmda ko’rsatilgandek tasvirlangan benzol molekulalarida atomlar orasidagi masofalar va atomdan paydo bo’ladigan bog’lar orasidagi burchaklar doim bir xil son qiymatga ega bo’ladi.Shuning uchun benzol molekulasini oltita uchga ega bo’lgan model sifatida qarashimiz mumkin.Modelda 6ta uch 12 ta qirra 8ta uchburchak yuzadan iborat oktaedr ko’rinishida.



28-rasm

Oktaedrning qavariq bo'lmaslig yoki yoki o'z o'zidan kesishmalarining mavjudligi bizning fikrimizga ta'sir qilmaydi.Endi masalaning Mohiyatiga keladigan bo'lsak olti atomli molekulaning oktaedri uning fizik va kimyoviy xossalari hisobiga shakli o'zgarishiga sabab bo'ladi.Bunday shakl o'zgarishi oktaedrning deformatsiya tufayli egilishiga misol bo'lishi mumkin.

Egiluvchi ko'pyoqlardan texnikada ,xizmat ko'rsatish sohasida va boshqa sohalarda keng foydalaniladi.Sabitovning teoremasining n≥4 fazolarda isboti uchun uning shogirdi Aleksandr Gayfullinning 2012- yilda Rossiya prezidenti mukofotiga sazovor bo'lishi Egiluvchi ko'pyoqlarning fanda katta ahamiyatga ega ekanligini ko'rsatdi.

Egiluvchan ko'pyoqlardan sanoat va texnikada keng foydalanish mumkin.Yangi zamonaviy binolarning dizaynini yaratishda ko'pyoqlardan foydalanish katta ahamiyatga ega,bunda tuzilmalarni moslashuvchan qilish maqsadga muvofiqdir.Arxitektorlar va qurilish muhandislari bu muammoni bartaraf etish uchun geometriyaning so'nggi tadqiqotlaridan foydalanishmoqda.Buning uchun yangi binolarning dizaynini yaratishda egiluvchi ko'pyoqlardan foydalanish qulayroqdir.

Egiluvchi ko'pyoqlardan buyumlarni qadoqlashda xususan suyuqliklarning idishlarini yaratishda foydalanilmoqda.Masalan shakli o'zgarganda idish ichidagi suyuqlik tashqariga chiqib ketmasligi uchun ularni egiluvchan qilib yaratish maqsadga muvofiqdir. Sabitov teoremasida aytilganidek har qanday egiluvchan ko'pyoq egilish vaqtida o'z hajmini saqlab qoladi,ya'ni u siqilmaydigan suyuqlik bilan to'ldirilganda ham egilishi mumkin.

Egiluvchi ko'pyoqlardan Kosmosda ham foydalaniladi.Fazogirlarning kiyimlari fazoda harakatlanishga qulayroq bo'lishi zarur, ularning tirsak qismi tizza qismlari egiluvchi bo'lishi kerak.Fazogirlarning fazoda qulayroq harakatlanishi uchun ularning kiyimlarini yaratishda egiluvchi ko'pyoqlardan foydalaniladi.keling ko'pyoqlikllardan ba'zi sohalarda foydalanish haqida yana tushunchalar beramiz:

1.Arxitektura va dizayndagi qo'llanishi

Zamonaviy arxitekturada egiluvchi shakllar yordamida turli ko'chma konstruktsiyalar (masalan, usti yopiladigan stadionlar, ochiladigan tomlar) loyihalanmoqda. Bunday strukturalar yengilligi, moslashuvchanligi va chidamliligi bilan ajralib turadi.

2. Kosmik muhandislikdagi ahamiyati

Kosmik qurilmalar, masalan, quyosh panellari yoki antenna tuzilmalarini egiluvchi ko‘pyoqliklar asosida loyihalash mumkin. Ular ixcham holatda raketada olib borilib, orbitada ochiladi. Bu yondashuv vaznni kamaytirish va joyni tejash imkonini beradi.

4. Ta'limda qo‘llanishi

Geometriya fanini o‘qitishda egiluvchi ko‘pyoqliklarni vizual modellar orqali tushuntirish o‘quvchilar tafakkurini rivojlantiradi. Ular o‘z qo‘llari bilan ko‘pyoqlik modellarini yasash orqali fazoviy tasavvurlarini mustahkamlaydi.

“Ko’pyoqlar” mavzusining nafaqat geometriyaning o’zida ,balki boshqa fanlarda ,kundalik hayotdagi ahmiyatini katta baholash mumkin.Ushbu geometrik jismlar bilan bog’liq elementlarni bilmasdan ,geometriyani,arxitektura ,astronomiya va fizikani rivojlantirishni keng o’rganish mumkin emas.

Egiluvchi ko’pyoqlar tushunchasi u bilan bogliq masalalar bugungi kunda dolzarb hisoblanadi.Shuning uchun bu tushunchalarni keng o’rganish muhim deb hisoblaymiz.

Egiluvchi ko‘pyoqliklar hozircha ko‘pchilik uchun noodatiy tushuncha bo‘lishi mumkin, biroq ularning ilmiy-texnikaviy sohalardagi ahamiyati kundan-kunga ortib bormoqda. Bunday shakllarning o‘rganilishi nafaqat nazariy geometriya uchun, balki muhandislik va texnologiya uchun ham muhim poydevor bo‘lib xizmat qiladi.

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O‘RTA TA’LIMDA KO‘PYOQLIKLARNI O‘QITISHNING BA’ZI USULLARI

Annotatsiya: *Ushbu maqolada O‘rta ta’limda Ko‘yoqliklar va ularni o’qitish metodikasi haqida so‘z boradi.*

Kalit so‘zlar:*Ko‘yoqliklarGeometrik masalalar, guruhlar bilan ishlash, Axborot texnalogiyalariko’rgazmali materiallar*

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SOME METHODS OF TEACHING POLYHEDRA IN SECONDARY EDUCATION

Annotation:*This article discusses polyhedra in secondary education and the methodology of teaching them.*

Keywords:*Polyhedra, geometric problems, group work, information technologies, visual materials****.***

Maktabda geometriyani o’qitish quyidagi maqsadlarni o’z ichiga oladi:

1. O’quvchilarda to’g’ri fazoviy tasavvurlarni hosil qilish:
2. O’quvchilarda mantiqiy va mustaqil fikirlashni rivojlantirish:

Geometriya fanini o’quvchilarni mantiqiy va mustaqil fikirlashga o’rgatibgina qolmay, irodasini mustahkamlash va diqqatini to’play olishga ham o’rgatadi. Geometriya bilan shug’ullanish o’quvchida qat’iyatlilik, aniq maqsadga intilish, ijodkorlik, mustaqillik, ma’suliyatli, mehnatsevar, intizomli va tanqidiy fikirlash kabi axloqiy hislatlarini tarbiyalaydi, o’zining qarashi va e’tiqodlarini dalillar asosida himoya qila olish ko’nikmalarini va malakalarini rivojlantiradi, fazoviy tasavvurlarini boyitadi va ilmiy- nazariy tafakkurini shakllantiradi.

O’quvchilarning fazoviy tasavvuri stereometriya o’qitish bilangina rivojlanib qolmaydi, ularni kichik sinflarda planimetriya o’qitish jarayonida ham rivojlantirib borish lozim. Masalan: “Siniq chiziq” mavzusini o’tganda, uning chizmasini doskada chizib, ta’rifini beribgina qolmay, balki uni fazoda qanday holda bo’lishini ko’rsatish muhimdir.

Geometrik masalalarni yechishda masala shartiga mos chizmani chizish juda muhim hisoblanadi. Ba’zida to’g’ri chizilgan chizma- masalaning “yarim yechimi” bilan tenglashtiriladi. Streometriyada masalaning chizmasini to’g’ri chizish nihoyatda muhim, o’ta ma’suliyatli va ba’zida esa murakkab ish hisoblanadi. Chunki streometrik shakllar uch o’lchamli bo’lib, ularni tekislikda daftar sahifasida

tasvirlash kerak bo'ladi. Noto'g'ri chizilgan chizma noto'g'ri yechimga yoki boshi berk ko'chaga boshlaydi.

Geometriyaning muhim jihatlaridan biri shundaki, o'rganigan ma'lumotlar o'qitishning keyingi bosqichi uchun tayanch manba hisoblanadi. Masalan, 8-sinfda geometriya kursi ko'pburchaklar mavzusidan boshlanadi. Ushbu mavzuni o'rganish orqali o'quvchi 7-sinfda o'rganilgan siniq chiziq va ko'pburchak haqidagi bilimlarini boyitadi va chuqurlashtiradi. Bunda siniq chiziqning ta'rifiga tayanib yassi ko'pburchak tushunchasi kiritiladi va bu mavzu o'z navbatida ko'pburchakning dioganallari haqidagi teorema bilan boyitiladi. Demak, o'quvchining ilgarigi siniq chiziq haqidagi bilimlari endilikda ko'pburchak tushunchasi va ko'pburchakning dioganallari haqidagi teorema orqali rivojlantiriladi.

"Kadrlar tayyorlash milliy dasturi" va O'zbekiston Respublikasi prezidentining "2001-2005 yillarda kompyuter va axborot texnalogiyalarini rivojlantirish, "INTERNET" ning xalqaro axborot tizimlariga keng kirib borishini ta'minlash dasturini ishlab chiqishni tashki etish chora tadbirlari to'g'risida" gi qarori, kompyuterlarni yanada rivojlantirish va axborot komunikatsiya texnalogiyalarini joriy etish to'g'risidagi farmoni qabul qilingan. O'tgan yilning 9 iyulida O'zbekiston Respublikasi prezidentining "Matematika ta'limi va fanlarini yanada rivojlantirishni davlat tomonidan qo'llab-quvvatlash, shuningdek, O'zbekiston Respublikasi Fanlar akademiyasining V.I.Romanovsky nomidagi matematika instituti faoliyatini tubdan takomillashtirish chora –tadbirlari to'g'risidagi qarori hamda 2020 yil 7-mayda "Matematika sohasidagi ta'lim sifatini oshirish va ilmiy tatqiqotlarni rivojlantirish chora-tadbirlari to'g'risida"gi qarori qabul qilingan.

Geometriya darslarida tabaqalashgan guruhlar bilan ishlashda axborot texnalogiyalarini qo'llash o'qituvchiga katta yordam beradi. O'quv-tarbiya jarayonida axborot texnalogiyalarini quyidagi shakllarda foydalanish ko'zda tutiladi.

1. Muayyan predmetlarni o'qitishda kompyuter darslari.
2. Kompyuter darslari ko'rgazmali material sifatida.
3. O'quvchilarning guruhli va jamoaviy ishlarini takomillashtirish va hokozo.

Axborot texnalogiyalari yordamida geometriya fani o'qitilsa, quyidagilarga erishiladi:

- Elektron o'quv qo'llanma imkoniyatlaridan foydalanib, o'quvchilarga mavzuni to'liq tushuntirish imkoniyati oshadi.
- Ularning bilim, ko'nikma va malakalari oshadi.
- Harakatli tasvirlar va animatsiyalar o'quvchilarning tasavvurlarini kengaytirishda muhim rol o'ynaydi.
- Amaliy ishlarga, ya'ni misol va masalalar yechishda, hayotiy misollar keltirishga, o'quvchilar o'rtasida savol-javob o'tkazishga ko'proq vaqt ajratiladi.
- O'quvchilarning ijodiy fikrlash qobiliyati shakllanadi.

•O’quvchilarda fazoviy tasavvurni rivojlantirish, mantiqiy fikirlash, geometrik o’lchash va yasashning amaliy usullarini o’rganish imkoniyatlarini beradi.

Shunday qilib, umumiy o’rta ta’lim maktablarida axborot texnalogiyalari kiritilishi, o’quvchi va o’qituvchi faoliyati, ularning darsdagi o’rni va vazifalarini keskin o’zgarishiga olib keladi.

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TEXNIK OLIY TA’LIM MUASSASALARIDA KONSTRUKTIV TAHLIL VA LOYIHALASHDA DIFFERENSIAL TENGLAMALARNI QO‘LLASHNING AMALIY ASOSLARI

Annotatsiya: *Differensial tenglamalar qurilish muhandisligi sohasida, xususan, strukturaviy tahlil va dizaynda hal qiluvchi rol o‘ynaydi. Ushbu tadqiqot murakkab tizimlarni modellashtirishda ularning ahamiyati, ko‘p qirraliligi va aniqligiga e’tibor qaratgan holda tuzilmalarni tahlil qilish va loyihalashda differentsial tenglamalarning turli xil qo‘llanilishini o‘rganadi.*

Kalit so‘zlar: *differensial tenglamalar, Strukturaviy tahlil, Qurilish muhandisligi, Dizayn optimallashtirish, Matematik modellashtirish.*

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PRACTICAL BASES OF THE APPLICATION OF DIFFERENTIAL EQUATIONS IN CONSTRUCTIVE ANALYSIS AND DESIGN IN TECHNICAL HIGHER EDUCATIONAL INSTITUTIONS

Abstract: *Differential equations play a crucial role in the field of civil engineering, particularly in structural analysis and design. This study examines the various applications of differential equations in structural analysis and design, focusing on their importance, versatility, and accuracy in modeling complex systems. .*

Keywords: *differential equations, Structural analysis, Civil engineering, Design optimization, Mathematical modeling.*

Strukturaviy tahlil va dizayn qurilish muhandisligining asosiy jihatlari bo‘lib, materiallar va komponentlarning tashqi kuchlarga qanday ta’sir qilishini chuqur tushunishni talab qiladi. Differentsial tenglamalar tuzilmalarning xatti-harakatlarini modellashtirish va turli sharoitlarda ularning ishlashini bashorat qilish uchun kuchli matematik vositadir. Ushbu tadqiqot differensial tenglamalarni qurilish muhandisligining turli jihatlarida qo‘llashni o‘rganish, ularning strukturaviy barqarorlikni tahlil qilish, dizaynlarni optimallashtirish, binolar va infratuzilma xavfsizligini ta’minlashdagi rolini ko‘rsatishga qaratilgan.

Oldingi tadqiqotlar differensial tenglamalardan strukturani tahlil qilish va loyihalashda foydalanishni keng o‘rganib chiqdi. Turli xil tadqiqotlar turli xil tuzilmalarda stress taqsimoti, deformatsiya naqshlari va buzilish usullarini bashorat qilishda differentsial tenglamalarning samaradorligini ko‘rsatdi. Materiallar va

strukturaviy elementlarning xatti-harakatlarini tartibga soluvchi differensial tenglamalarni echish orqali muhandislar binolar va infratuzilmaning ishlashini to‘g‘ri baholashi mumkin, bu esa yaxshi dizayn qarorlari va umumiy xavfsizlikni yaxshilashga olib keladi.

Ushbu tadqiqot qurilish muhandisligida differentsial tenglamalarni qo‘llashni ko‘rsatish uchun matematik modellar va tenglamalardan foydalangan holda nazariy yondashuvni qo‘llaydi. Differensial tenglamalar strukturaviy tizimlarni tahlil qilish, muhim parametrlarni aniqlash va yaxshilangan ishlash va chidamlilik uchun dizaynlarni optimallashtirish uchun qanday ishlatilishini ko‘rsatish uchun misollar va misollar keltirilgan. Metodologiya real stsenariylarni simulyatsiya qilish va turli yuklash sharoitlarida tuzilmalarning javobini bashorat qilish uchun analitik va raqamli usullar orqali differentsial tenglamalarni echishni o‘z ichiga oladi.

Natijalar va muhokama:

Ushbu tadqiqot natijalari differensial tenglamalarning strukturaviy tahlil va loyihalashdagi ahamiyatini ko‘rsatib, ularning qurilish muhandisligidagi murakkab tizimlarning xatti-harakatlarini to‘g‘ri taxmin qilish qobiliyatini namoyish etadi. Differensial tenglamalarni yechish orqali muhandislar stress taqsimoti, burilish va barqarorlik kabi muhim omillarni aniqlashlari mumkin, bu ularga material tanlash, strukturaviy konfiguratsiya va yuk ko‘tarish qobiliyati bo‘yicha asosli qarorlar qabul qilish imkonini beradi. Muhokama inshootlarning xavfsizligi, samaradorligi va barqarorligini ta’minlash uchun dizayn jarayoniga differentsial tenglamalarni kiritish muhimligini ta’kidlaydi. Qurilish muhandisligida strukturaviy tahlil ko‘pincha materiallar va komponentlarning yuklar, tebranishlar va atrof-muhit sharoitlari kabi tashqi kuchlarga munosabatini bashorat qilishni o‘z ichiga oladi. Differentsial tenglamalar struktura ichidagi kuchlar, siljishlar va deformatsiyalar o‘rtasidagi munosabatlarni matematik tavsiflash uchun asos yaratish orqali ushbu tahlillar uchun asos bo‘lib xizmat qiladi. Muayyan strukturaviy tizimlarga moslashtirilgan differentsial tenglamalarni shakllantirish va yechish orqali muhandislar materiallarning xatti-harakati, kuchlanish taqsimoti va buzilish mexanizmlari haqida bebaho tushunchalarga ega bo‘lib, ularga xavfsiz va mustahkam tuzilmalarni loyihalash imkonini beradi.

Strukturaviy tahlildan tashqari, differentsial tenglamalarni qo‘llash qurilish muhandisligida dizaynni optimallashtirish sohasiga ham taalluqlidir. Turli strukturaviy konfiguratsiyalarning ishlashini modellashtirish uchun differensial tenglamalardan foydalangan holda, muhandislar dizayn imkoniyatlarining keng doirasini o‘rganishlari, dizayn tanlovlarining struktura barqarorligiga ta’sirini bashorat qilishlari va strukturaviy samaradorlikni oshirish bilan birga materiallardan foydalanishni minimallashtiradigan optimal echimlarni aniqlashlari mumkin. Differensial tenglamalar asosida boshqariladigan ushbu optimallashtirish jarayoni nafaqat tuzilmalarning ishlashi va uzoq umr ko‘rishini oshiradi, balki arxitektura dizayni va qurilish amaliyotida innovatsiyalarni qo‘llab-quvvatlaydi.

Xavfsizlik va ishonchlilik qurilish muhandisligida munozarali bo‘lmagan omillardir va differentsial tenglamalarni qo‘llash tuzilmalarning qat’iy xavfsizlik standartlariga javob berishini ta’minlashda hal qiluvchi rol o‘ynaydi. Differensial

tenglamalarni tahlil qilish orqali muhandislar potentsial nosozlik nuqtalarini aniqlashlari, yuklarga bardosh berish uchun struktura imkoniyatlarini baholashlari va binolar va infratuzilmalarning xavfsizlik chegaralarini oshirish choralarini ko‘rishlari mumkin. Differensial tenglamalardan olingan matematik modellar bilan ta’minlangan ushbu proaktiv yondashuv muhandislarga tizimli zaifliklarni oldini olish va xavflarni kamaytirish, natijada hayot va mulkni himoya qilish imkonini beradi.

Barqarorlik dolzarb masala bo‘lgan davrda qurilish muhandisligida differentsial tenglamalarni qo‘llash ekologik toza amaliyotlarni rivojlantirishga yordam beradi. Differensial tenglamalarga asoslangan matematik modellarni qo‘llash orqali muhandislar materiallar isrofgarligini kamaytirish, energiya samaradorligini oshirish va qurilish loyihalarining atrof-muhit izini minimallashtirish uchun strukturaviy dizaynlarni optimallashtirishlari mumkin. Barqarorlikka asoslangan ushbu differensial tenglamalarning aniqligi va bashorat qilish kuchiga asoslangan tashabbuslar yanada barqaror va bardoshli qurilgan muhitni shakllantirishda matematikaning muhim rolini ta’kidlaydi.

Xulosa qilib aytganda, qurilish muhandisligida differentsial tenglamalarni qo‘llash tuzilmalarning xavfsizligi va ishonchliligini ta’minlash uchun ajralmas hisoblanadi. Matematik modellashtirish kuchidan foydalangan holda muhandislar binolar va infratuzilmani aniqlik va aniqlik bilan tahlil qilishi va loyihalashi, ish faoliyatini optimallashtirishi va xavflarni minimallashtirishi mumkin. Differentsial tenglamalar konstruktiv tizimlarning murakkab xatti-harakatlarini tushunish uchun tizimli yondashuvni ta’minlaydi, muhandislarga konstruksiyalarning sifati va mustahkamligini oshiradigan asosli qarorlar qabul qilish imkonini beradi. Oldinga siljish, ushbu sohadagi keyingi tadqiqotlar va ishlanmalar qurilish muhandisligi sohasini rivojlantirish, innovatsiyalar, tarkibiy tahlil va dizayn amaliyotida mukammallikni rivojlantirishni davom ettiradi.

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KO‘PYOQLIKKA BOG‘LIQ KATTALIKLAR

Annotatsiya: *Ushbu maqolada Ko‘yoqliklar ularni o‘rganish, ko‘pyoqliklarning elementlari, ko‘pyoqloklar bilan bog‘liq ba’zi kattaliklar haqida so‘z boradi.*

Kalit so‘zlar: *Ko‘yoqliklar, Prizma, Prizmaning sirti, parallelepiped va kub, piramidalar*

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LARGE CHARACTERISTICS

Abstract: *This article discusses polyhedra, their study, the elements of polyhedra, and some quantities related to polyhedra*

Keywords: *Polyhedrons, Prism, Surface of a Prism, Parallelepiped and Cube, Pyramids,*

Prizma: Prizmaning sirti. Bizga ixtiyoriy prizma berilgan bo’lsin. Prizma yon sirtining yuzi deb, uning yon yoqlari yuzlarining yig’indisiga aytiladi. Prizmaning to’la sirti deb, uning barcha yon yoqlari yuzlari va ikkita asosi yuzlarining yig’indisiga aytiladi.

$$S_{yon} = S_{A_1AB_1B} + S_{B_1BC_1C} + \cdots + S_{E_1EA_1A}$$

$$S_{to'la} = S_{yon} + 2S_{asos}$$

Teorema (2.3): Prizmaning yon sirtining yuzi prizma perpendikulyar kesimi perimetrining uning yon qirrasiga ko’paytmasiga teng.

Natija: To’g’ri prizmaning yon sirti prizma asosining perimetri bilan uning yon qirrasi uzunligi ko’paytmasiga teng:

$$S_{yon} = P_{asos} \cdot l$$

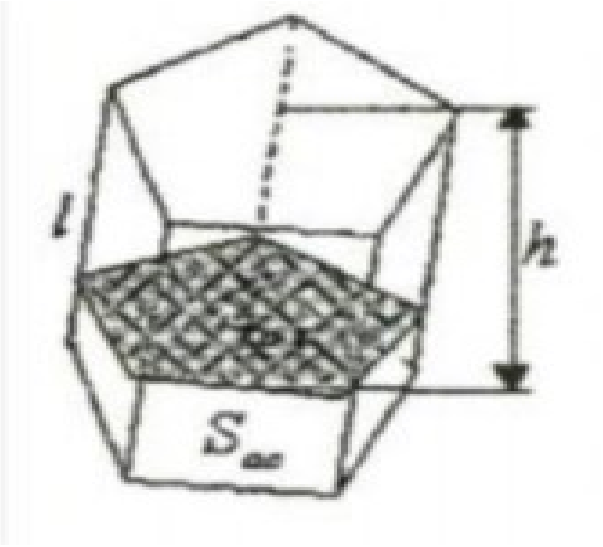
bunda ***l***-yon qirra uzunligi.

Prizmaning hajmini hisoblash formulasini keltirib chiqarishdan avval prizmalarning quyidagi xossasini ko’rib chiqamiz.

Lemma: Og’ma prizma shunday to’g’ri prizmaga tengdoshki, to’g’ri prizmaning asosi og’ma prizmaning perpendikulyar kesimidan iborat bo’lib, balandligi esa og’ma prizmaning yon qirrasiga tengdir.

Teorema (2.4): Uchburchakli prizmaning hajmi asosining yuzi bilan balandligi ko’paytmasiga teng.

$$V = S_{asos} \cdot H$$



Parallelepiped va kub: To'g'ri burchakli parallelopipedning uchta simmetriya o'qi va uchta simmetriya tekisligi bor.

To'g'ri burchakli parallelopipedning bitta uchidan chiquvchi uchta qirrasi uzunliklariga uning o'lchamlari deb aytiladi.

Xossa: To'g'ri burchakli parallelepiped d dioganalining kvadrati uning o'lchamlari: a, b va c ning kvadratlari yig'indisiga teng:

$$d^2 = a^2 + b^2 + c^2$$

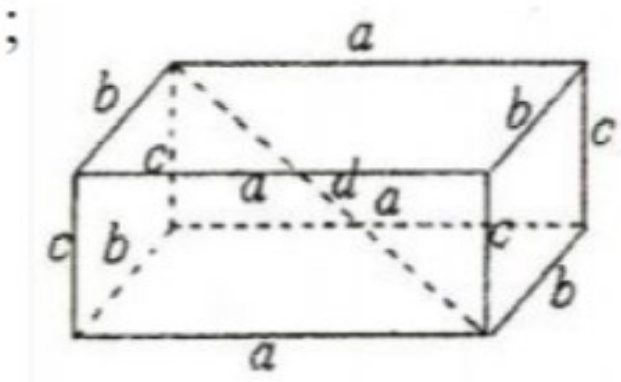
Ta'rif (2.7) O'lchamlari teng bo'lgan to'g'ri burchakli parallelepiped **kub** deyiladi.

Teorema(2.5): To'g'ri burchakli parallelepiped hajmi uning uchta o'lchamlari ko'paytmasiga teng;

$$V = a \cdot b \cdot c$$

Natija: To'g'ri burchakli parallelepipedning hajmi asosining yuzi bilan balandligining ko'paytmasiga teng:

$$V = S \cdot h$$



Piramidalar: Piramida yon sirtining yuzi uning yon yoqlari yuzlarining yig'indisidan iborat. Piramida to'la sirtining yuzi uning yon sirti va asosining yuzi yig'indisiga teng:

$$S_{to'la} = S_{yon} + S_{asos}$$

Teorema(2.6): Agar piramida asosidagi barcha ikki yoqli burchaklari φ ga teng bo'lsa,

$$S_{asos} = S_{yon} \cdot \cos \varphi$$ bo’ladi.

Bu ortogonal proyeksiya yuzi haqidagi teoremadan kelib chiqadi.

Teorema (2.7). Muntazam piramida deb asosi muntazam ko’pburchakdan iborat va balandligi asosining markaziga tushuvchi piramidaga aytiladi.

Muntazam piramida yon yog’ining piramida uchidan tushurilgan balandligi piramidaning **apofemasi** deb ataladi.

Muntazam piramidaning yon yoqlari, yon qirralari va apofemalari o’zaro teng bo’ladi. Shuningdek, uning asosidagi barcha ikki yoqli burchaklari, barcha yon qirralaridagi ikki yoqli burchaklari ham o’zaro teng bo’ladi. Muntazam piramida balandligining ixtiyoriy nuqtasi piramida asosining uchlaridan va qirralaridan hamda yon yoqlaridan baravar uzoqlikda yotadi. Agar piramidaning barcha yon qirralari o’zaro teng bo’lsa, u holda uning asosiga tashqi aylana chizish mumkin va bu aylana markazi piramida balandligi asosi bilan ustma-ust tushadi.

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REVMATIZM BILAN KASALLANGAN BOLALARDA SURUNKALI TONZILLITNI UZOQ MUDATLI XIRURGIK DAVOLASHNING NATIJALAR

Annotatsiya: *Maqolada revmatizm bilan kasallangan bolalarda surunkali tonzillitni xirurgik davolashning uzoq muddatli natijalari o‘rganilgan. Bizning kuzatuvimiz ostida 6 yil davomida 386 nafar revmatizm bilan og'rigan bola bo‘lgan. Bu bemorlar uch guruhga bo‘lingan: birinchi guruhga 145 nafar revmatizm va surunkali tonzillit bilan og'rigan bemorlar kiritilgan, ularga so‘nggi bir necha yil davomida surunkali tonzillit bo‘yicha konservativ davolash usullari qo‘llanilgan. Tonzillektomiyadan so‘ng angina va paratonzillyar yallig‘lanishlarning qaytalanishi 97% holatlarda kuzatilmagan.*

Kalit so`zlar: *bolalar, surunkali tonzillit, revmatizm bilan og'rigan, revmatik miokardioskleroz, tonzillektomiya.*

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LATE RESULTS OF SURGICAL TREATMENT OF CHRONIC TONSILLITIS IN CHILDREN WITH RHEUMATISM

Abstract: *The article studies the late results of surgical treatment of chronic tonsillitis in children with rheumatism. We observed 386 children with rheumatism for 6 years. These patients were divided into three groups: the first included 145 people suffering from rheumatism and chronic tonsillitis, who had been undergoing conservative treatment for chronic tonsillitis for the past few years. Recurrences of tonsillitis and paratonsillar inflammation after tonsillectomy ceased in 97% of cases.*

Keywords: *children, chronic tonsillitis, rheumatism, rheumatic myocardial sclerosis, tonsillectomy.*

Kirish. Revmatizm bilan og‘rigan bemorlarda surunkali tonzillitni xirurgik davolashning uzoq muddatli natijalarini o‘rganishga bir qancha adabiyotlar bag‘ishlangan [3,4]. Ushbu davolashning samaradorligi haqida mahalliy va xorijiy adabiyotlarda turli xil ma’lumotlar keltirilgan [1,2]. Bir qator tadqiqotchilarning

ma’lumotlariga ko‘ra, revmatizmni davolash natijalari tonzillektomiya imkon qadar revmatizmning dastlabki bosqichlarida va erta yoshda amalga oshirilganda yaxshiroq bo‘lgan [5,6]. Surunkali tonzillitni xirurgik davolash natijalarini baholashda revmatizm bilan og‘rigan bemorlarda yurak-qon tomir tizimining holati, revmatizmning qaytalanishi va takroriy hujumlar, yurak nuqsoning shakllanishi va yurak patologiyasining rivojlanishi asos qilib olinishi tavsiya etiladi [7]. Yuqorida keltirilganlarning barchasi bizni revmatizm bilan og‘rigan bolalarda surunkali tonzillitni xirurgik davolashning uzoq muddatli natijalarini o‘rganishga undadi.

Tadqiqot maqsadi. Biz revmatizm bilan og‘rigan bolalarda surunkali tonzillitni xirurgik davolashning uzoq muddatli natijalarini o‘rgandik.

Tadqiqot materiallari va usullari. Bizning kuzatuvimiz ostida 6 yil davomida 6 yoshdan 14 yoshgacha bo‘lgan 386 nafar revmatizm bilan og‘rigan bola bo‘ldi. Ulardan 118 nafari qizlar, 128 nafari o‘g‘il bolalar, 140 nafari shahar aholisi, 146 nafari qishloq va qishloq joylarida yashovchilar edi. Revmatik miokardioskleroz 253 bemorda, yurak qusuri (ko‘pincha mitral klapan yetishmovchiligi) 33 kishida aniqlangan.

Tadqiqot natijalari. LOR a’zolarini ko‘rikdan o‘tkazishda 246 bemorda surunkali tonzillit aniqlangan, 140 kishida LOR a’zolari bo‘yicha patologiyalar kuzatilmagan. Surunkali tonzillit shahar aholisida (69,1%) qishloq va qishloq joylarida yashovchilarga (54,8%) nisbatan ancha tez-tez tashxis qo‘yilgan. O‘g‘il va qiz bolalar surunkali tonzillit bilan bir xil darajada kasallangan. Revmatik jarayonning uzoq muddatli kuzatuvida bemorlar uch guruhga bo‘lingan. Birinchi guruhga 145 nafar revmatizm va surunkali tonzillit bilan og‘rigan bemorlar kiritilgan, ularga so‘nggi bir necha yil davomida surunkali tonzillit bo‘yicha konservativ davolash usullari qo‘llanilgan. Ikkinchi guruhdagi bemorlarga (101 kishi) revmatizm va surunkali tonzillit boshlanganidan keyin turli muddatlarda tonzillektomiya amalga oshirilgan. Uchinchi guruh – nazorat guruhi: faqat revmatizm bilan og‘rigan bemorlar (140 kishi). Tonzillektomiya revmatizmning birinchi yilida 16 bemorda, ikki yildan keyin 27 bemorda, uchinchi yilda 22 bemorda, to‘rtinchi yilda 7 bemorda, beshinchi yilda 4 bemorda va oltinchi yilda 7 bemorda amalga oshirilgan. Qolgan 4 bemorga bodomcha olib tashlash kasallikning 8-9-yillarida qilingan. Shuni ta’kidlash kerakki, ikkinchi guruhdagi 6 bemor revmatizmning boshlanish vaqtini bilmagan, 8 bemor esa revmatizm aniqlanishidan 1 yil oldin surunkali tonzillit bo‘yicha operatsiya qilingan. Birinchi guruhdagi bemorlarda takroriy hujumlar 6,2% holatlarda qayd etilgan; tonzillektomiya qilingan ikkinchi guruhdagi bemorlarda revmatizmning takroriy hujumlari ancha kam – 3,9% holatlarda kuzatilgan va bu asosan kasallik boshlanganidan 5 yildan keyin operatsiya qilingan bemorlarda ro‘y bergan. Ikkinchi guruhdagi bemorlarda operatsiyadan keyingi davrda yurak qusurlarining shakllanishi kuzatilmagan. Uchinchi guruhdagi bemorlarda revmatizmning takroriy hujumlari 2,1% holatlarda tashxis qo‘yilgan.

Shuni ta’kidlash kerakki, tonzillektomiyadan so‘ng angina va paratonzillyar yallig‘lanishlarning qaytalanishi 97% holatlarda to‘xtagan. Revmatizmni davolashning eng yaxshi natijasi kasallik boshlanganidan keyingi dastlabki ikki yil

ichida operatsiya qilingan bemorlarda kuzatilgan. Surunkali tonzillitni xirurgik davolashning uzoq muddatli natijalarini, bizning fikrimizcha, pediatr bilan birgalikda va yurak-qon tomir tizimining holatini hisobga olgan holda o‘rganish kerak.

Xulosa. 6 yil davomida 6 yoshdan 14 yoshgacha bo‘lgan 386 nafar revmatizm bilan og‘rigan bola kuzatuv ostida bo‘ldi. Bu bemorlar uch guruhga bo‘lingan: birinchi guruhga 145 nafar revmatizm va surunkali tonzillit bilan og‘rigan shaxslar kiritilgan, ularga so‘nggi bir necha yil davomida surunkali tonzillit bo‘yicha konservativ davolash usullari qo‘llanilgan; ikkinchi guruhdagi bemorlarga (101 kishi) revmatizm va surunkali tonzillit boshlanganidan keyin turli muddatlarda tonzillektomiya qilingan; uchinchi guruh – nazorat guruhi: faqat revmatizm bilan og‘rigan bemorlar (140 kishi). Revmatizmning takroriy hujumlari birinchi guruhda 6,2%, ikkinchi guruhda 3,9%, uchinchi guruhda 2,1% holatlarda qayd etilgan. Tonzillektomiyadan so‘ng angina va paratonzillyar yallig‘lanishlarning qaytalanishi 97% holatlarda to‘xtagan.

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INCLUSIVE EDUCATION IN A RENEWING UZBEKISTAN

Abstract: *Information is provided on the progressive work being carried out in inclusive education on the initiatives of our President Shavkat Miromonovich Mirziyoyev and the decisions taken on the attention paid to inclusive education in a Renewing Uzbekistan and the wide opportunities created.*

Keywords: *inclusive education, decision, opportunity, special education, mass education, socialization.*

In a Renewing Uzbekistan, taking into account the need to improve the quality of education and the right of all school-age children to receive quality education, attention to inclusive education has increased even more.

In his address to the Oliy Majlis on December 20, 2022, our President Shavkat Miromonovich Mirziyoyev proposed that 2023 be named the "Year of Attention to Humanity and Quality Education." This initiative was supported by those present. After all, improving the quality of education is the only right way for the development of New Uzbekistan. Therefore, it is necessary to conduct more dialogue and reforms in this area, and to develop concepts for further improving the quality of educational activities.

On September 19, 2005, the Order of the Supreme Council of the Republic of Uzbekistan No. 234 approved the "Interim Regulation on Inclusive Education for Children and Adolescents with Disabilities" I. It states that children and adolescents with disabilities are included in inclusive education in the following order:

-children with delayed mental development;
-motor balance disorders;
-children and adolescents with oligophrenic level who can serve themselves;
-children with speech disorders;
-hearing impaired children;
-visually impaired and late (after 5 years of age) children;
-blind (mastered Braille system and reading) children and teenagers;
-deaf (having speech at the level of communication, knowing how to read and write) children and adolescents.

The Cabinet of Ministers of the Republic of Uzbekistan approved the "Temporary Regulation on approval of regulatory legal acts on education of children with special educational needs" dated 12.10.2021. The document was developed in accordance with the resolution No. PQ-4860 dated 13.10.2020 "On measures to further improve the system of education and upbringing of children with special educational needs".

As well as the positive aspects of inclusive education, there are, of course, negative aspects. In order to eliminate and improve this, the following conditions are being implemented:

-training of pedagogical personnel for the inclusive education system, advanced training, and materials on inclusive education methodology improvement;

-in the process of inclusive education, spiritual and moral upbringing, achieving a healthy and strong physical development of the child;

-in the implementation of inclusive education, first of all, to pay attention to the education of children with special needs in remote areas;

-to form lessons based on inclusive education programs using modern information and communication technologies;

The following results are expected to be achieved through the inclusive education system:

The development of individuals with special educational needs, their integration into society, the conveniences and advantages of the inclusive education system, the quality of education, as well as the level of development of students, ensuring their success through the development of their own abilities, through the gradual organization of inclusive education, children with special educational needs receive education in general education institutions as equal members of society, and similar results.

Inclusive education is a type of education that provides for the development of physical, mental, is to receive education in general education institutions, regardless of social, emotional and other characteristics. Psychologist L.S. Vygotsky (1986-1934) is the founder of inclusive education, according to his theory, children learn most effectively in a social environment. He said that the development of higher mental functions begins with social interaction, and then becomes personal. L. Vygotsky emphasizes the great role of educators in the theory of socio-cultural development. In many countries, this sentence shows that this is the right view.

Our level of education has been stable for a long time. In this case, the education system works well, but does not develop. Because development always occurs where innovation is created. The following words of our President Shavkat Miromonovich Mirziyoyev serve as the basis for this statement: “In these processes, we need deputies and senators, representatives of the neighborhood, intellectuals, youth, entrepreneurs and the general public to be active, to make new proposals and initiatives I ask”. Our President Sh.M. Mirziyoyev has adopted several laws for people with disabilities. One of such laws is the President’s Decree “On State Support for Persons with Disabilities”. Our President Sh.M. Mirziyoyev has adopted several laws for persons with disabilities.

One of these laws is the Decree of the President of the Republic of Uzbekistan No. PF-5270 dated December 1, 2017 “On measures to radically improve the system of state support for persons with disabilities”, which establishes the procedure for allocating a quota based on a two-percent state grant from the total number of applicants for admission to higher educational institutions for persons with disabilities who participated in entrance exams. This law was adopted for persons

with disabilities of groups I and II. The Resolution of the President of the Republic of Uzbekistan “On additional measures to improve the system of admission to higher educational institutions through testing” dated May 14, 2019 No. PQ-4319 establishes that applicants who graduated from educational institutions in the years preceding the academic year in which testing is organized for admission to a higher educational institution will pay a fee in the amount of half the basic calculation amount. Persons with disabilities are exempted from this fee. This is also one of the benefits created for them.

In addition, several more privileges have been created for persons with disabilities. The head of our state has also adopted several more laws and resolutions for persons with disabilities. They effectively use the opportunities created for them. Although it is somewhat difficult for them to master the knowledge given to them, they strive to become masters of a field of their choice. Admission to higher education created for them is a sign of their aspirations, they try to realize their dreams and hopes. They never stumble in life, they use their knowledge to make new discoveries in their favorite fields and fields. When you see people with disabilities, you don't think of them as disabled. You fall in love with them at first sight. This is why it is a bit difficult to educate people. But these people also need someone's help. Educating them is a worthy cause. I am also studying in the field of special pedagogy, Surdopedagogy, to help such people. Another important innovation for children with disabilities is the introduction of inclusive education. In inclusive education, they study in a regular school like healthy children. This is also one of the privileges created for them. Therefore, we also try to help people with disabilities as much as we can. All the youth of Uzbekistan are one force and together we will try to achieve the goals set before us.

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BOSHLANG‘ICH SINF O‘QISH SAVODXONLIGI DARSLARIDA INTERFAOL METODLARDAN FOYDALANIB DARS O‘TISHNING INNOVATSION USULLARI

Annotatsiya: *Ushbu maqola boshlang‘ich sinflarda o‘qish savodxonligi darslarida interfaol usullardan foydalanishning afzalliklarini o‘rganadi va o‘qituvchilarga ushbu usullarni o‘z sinflarida samarali qo‘llashda yordam berish uchun amaliy strategiyalar va misollar beradi. Interaktiv ovoz chiqarib o‘qish va munozaraga asoslangan faoliyatdan tortib raqamli vositalar va interaktiv o‘yinlargacha, interfaol usullarni o‘z ichiga olish an’anaviy o‘qish darslarini yosh o‘quvchilarda umrbod o‘qishga bo‘ygan muhabbatni uyg‘otadigan qiziqarli va interaktiv tajribaga aylantirishi mumkin.*

Kalit so‘zlar: *o‘qish savodxonligi, interfaol metodlar, innovatsiyalar, innovstsion usullar, interaktiv taqdimotlar, integratsiyalash.*

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INNOVATIVE TEACHING METHODS USING INTERACTIVE METHODS IN READING AND LITERACY LESSONS IN PRIMARY SCHOOL

Abstract: *This article explores the benefits of using interactive methods in elementary reading literacy classes and provides practical strategies and examples to help teachers use these methods effectively in their classrooms. From interactive read-alouds and discussion-based activities to digital tools and interactive games, incorporating interactive methods can transform traditional reading lessons into fun and engaging ways to foster a lifelong love of reading in young learners. can make it an interactive experience.*

Key words: *reading literacy, interactive methods, innovations, innovative methods, interactive presentations, integration.*

Kirish

Ta’lim sohasida o‘qishga bo‘lgan mehrni yoshligidan tarbiyalash bolaning o‘quv muvaffaqiyati va har tomonlama rivojlanishi uchun muhim ahamiyatga ega. Boshlang‘ich sinflarda o‘qish savodxonligi darslari kuchli o‘qish, tushunish va

tanqidiy fikrlash qobiliyatlarini shakllantirish uchun asos bo‘lib xizmat qiladi. Interfaol metod – ta’lim jarayonida o‘quvchilar hamda o‘qituvchi o‘rtasidagi faollikni shirish orqali o‘quvchilarning bilimlarni o‘zlashtirishini faollashtirish, shaxsiy sifatlarini rivojlantirishga xizmat qiladi. Interfaol metodlarni qo‘llash dars samaradorligini oshirishga yordam beradi.

Adabiyotlar tahlili va tadqiqot metodologiyasi

Boshlang‘ich sinflarda o‘qish savodxonligi bo‘yicha darslar o‘quvchilarni turli xil matnlar bilan tanishtirishga mo‘ljallangan: ertak kitoblari va she’riyatdan tortib, badiiy bo‘lmagan maqolalar va axborot matnlarigacha. O‘quvchilarni turli janr va yozuv uslublari bilan tanishtirish orqali o‘qituvchilar yozma so‘zni chuqur qadrlashni o‘stirishga hamda o‘quvchilarning so‘z boyligi va tushunish ko‘nikmalarini kengaytirishga yordam beradi. Interaktiv ovoz chiqarib o‘qish mashg‘ulotlari, boshqariladigan o‘qish faoliyati va mustaqil o‘qish vaqti orqali o‘quvchilar ravonlik, dekodlash ko‘nikmalari va akademik muvaffaqiyat uchun zarur bo‘lgan o‘qishni tushunish strategiyalarini rivojlantirishlari mumkin.Bundan tashqari, o‘qish savodxonligi darslari o‘quvchilarga adabiyot orqali ijodkorlik, tasavvur va empatiyani o‘rganish imkoniyatini beradi. Qahramonlarning motivlari, sharoitlari va syujet ishlanmalarini o‘rganish orqali talabalar barcha fan sohalarida foydali bo‘lgan kuchli xulosa chiqarish va tahliliy ko‘nikmalarni rivojlantirishlari mumkin. Bundan tashqari, adabiyot orqali turli nuqtai nazarlar va madaniyatlar bilan tanishish empatiya, bag‘rikenglik va atrofdagi dunyoni chuqurroq tushunishga yordam beradi.

Muhokama va natijalar

Boshlang‘ich sinf o‘quvchilarida o‘qishga bo‘lgan muhabbatni rivojlantirish va savodxonlik ko‘nikmalarini oshirish uchun o‘qituvchilar yosh ongni jalb qiladigan va dinamik o‘quv muhitini rivojlantiruvchi interfaol usullarga tobora ko‘proq murojaat qilmoqdalar. O‘qish darslariga interfaol texnika va vositalarni kiritish orqali o‘qituvchilar tushunish, tanqidiy fikrlash va umumiy o‘qish mahoratini oshiradigan yanada chuqurroq va ishtirokchi tajriba yaratishlari mumkin.

1. Hikoya seanslari:

Hikoya o‘quvchilarning tasavvurlarini o‘ziga jalb etish va o‘qishga bo‘lgan mehrini uyg‘otishning kuchli usulidir. Interfaol hikoya qilish mashg‘ulotlarida o‘qituvchilar o‘quvchilarni natijalarni bashorat qilishga, muqobil yakunlarni tasavvur qilishga yoki hatto rolli o‘yin qahramonlarini rag‘batlantirish orqali hikoyaga jalb qilishlari mumkin.

2. Ovozli o‘qish va birgalikda o‘qish:

O‘quvchilarga ovoz chiqarib o‘qish va birgalikda o‘qish faoliyati bilan shug‘ullanish ravon o‘qishni modellashtirish, so‘z boyligini yaxshilash va tushunishni kuchaytirishning samarali usullaridir. Ovoz chiqarib o‘qiladigan interaktiv sessiyalar savollar berish, hikoya elementlarini muhokama qilish yoki o‘quvchilarni o‘z tajribalari bilan bog‘lanishga undash uchun pauza qilishni o‘z ichiga olishi mumkin.

3. Interaktiv texnologiya vositalari:

Ta'lim dasturlari, raqamli hikoyalar platformalari va interaktiv doskalar kabi interaktiv texnologiya vositalarini o‘z ichiga olish o‘quvchialarga qiziqarli va dinamik o‘qish tajribasini taqdim etishi mumkin. Ovozli hikoya, animatsiyalar va bosiladigan elementlar kabi xususiyatlarga ega interaktiv elektron kitoblar tushunishni kuchaytiradi va yosh o‘quvchilar uchun o‘qishni yanada interaktiv va qiziqarli qiladi.

4. O‘qish o‘yinlari va faoliyati:

O‘qish ko‘nikmalarini o‘z ichiga olgan o‘quv o‘yinlari va mashg‘ulotlar boshlang‘ich sinf o‘quvchilari uchun qiziqarli va qiziqarli o‘rganishni ta'minlaydi. O‘qish tushunchalarini interaktiv va zavqli tarzda mustahkamlash uchun so‘z boshqotirmasi, so‘z boyligini rivojlantirish o‘yinlari va tushunish viktorinalaridan foydalanish mumkin.

5. Rol o‘ynash va dramatizatsiya:

O‘quvchilarni hikoyalardan sahna ko‘rinishlariga, o‘z ssenariylarini yaratishga yoki o‘quvchilarning teatr tomoshalarida ishtirok etishga undash til rivojlanishiga yordam beradi, ravon o‘qiydi va ovoz chiqarib o‘qishga bo‘lgan ishonchni oshiradi. O‘quvchilarni rolli o‘yinlar va dramatizatsiya orqali hikoya olamiga singdirish orqali o‘qituvchilar empatiya, ijodkorlik hamda personajlar va syujetlarni chuqurroq tushunishni rivojlantirishi mumkin.

Xulosa

Xulosa o‘rnida aytish mumkinki, boshlang‘ich sinflarda o‘qish savodxonligi darslariga interfaol usullarni kiritish o‘quv tajribasini boyitishi, o‘quvchilarni o‘qish jarayoniga faol jalb etishi va butun umr davomida o‘qishga bo‘lgan ishtiyoqini oshirishi mumkin. Interfaol va dinamik ta'lim muhitini yaratish orqali o‘qituvchilar yosh o‘quvchilarga ishonchli o‘quvchilar, tanqidiy fikrlovchilar va yozma so‘zning qiziquvchan tadqiqotchilari bo‘lishlari mumkin.

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THE WORK BOBURNOMA AS A HISTORICAL SOURCE

Abstract: *The poet narrates his memoirs in an artistic storytelling style that is simple and fluent. The work describes events that took place in Central Asia, Afghanistan, and India from the year 1494 to 1530. The beautiful illustrations adorning the Boburnoma manuscripts also contributed to the fame of its translation. The miniatures created for the Persian versions of the Boburnoma are considered outstanding examples of Eastern painting art. The great king Babur continued the grand architectural traditions characteristic of the Timurids in India.*

Key words: *Boburnoma, king, creativity, customs, work, place names, virtues, terms,culture,ethnographer,naturalist,linguist.*

Zahiriddin Muhammad Babur does not limit himself to merely recording historical facts or providing chronological information about wars and campaigns; rather, he recounts events in a lively and engaging language, describing nature and ethnographic situations, and bringing the features of the era to life. In the Boburnoma, he creates vivid character portraits of dozens of historical figures, paints landscapes of nature, and embellishes the book with various plots, romantic adventures, and poetic excerpts. The personalities, appearances, behaviors, habits, pasts, and genealogies of the individuals mentioned are described one by one in detail.

The central figure in the work is, undoubtedly, Babur himself. His heart, rich with emotions and feelings, vividly comes to life before our eyes. He clearly and reflectively portrays the biographies of his contemporaries—their appearances, customs, aspirations, interests, and behaviors—as if seen in a mirror. In this respect, the Boburnoma is regarded as the only true historical descriptive example in Central Asia. Babur provides extensive information about the geography, fauna, and flora of Central Asia, Khorasan, and India. In particular, the Boburnoma contains valuable facts about the ethnography, science, art, and culture of the Indian people. Due to its comprehensive nature, encyclopedic character, and the way it showcases the immense expressive capacity of the Uzbek literary language, the Boburnoma is considered a cultural monument on par with Alisher Navoi's Khamsa. The rapid rise in its fame and its translation into Persian several times already during the 16th century serve as evidence of this claim.

The Boburnoma was first translated into Persian in 1589 by Abdurahimkhan ibn Bayramkhan, who served at the court of Babur's grandson, Akbar. The translation was widely copied and disseminated throughout Eastern countries under the titles Waqeoti Boburi and Tarikhi Bobursohi. In his translation, Abdurahimkhan was able to preserve Babur's unique narrative style, and the work

was accepted as a major innovation in Persian literature and historiography. The historical events it covers are presented with honesty and accuracy, and it is not only rich in scholarly facts but also distinguished by its fluent style, simplicity, and charm. Babur's work had a profound influence on historical memoirs written after it.

The progressive intellectuals of the East, recognizing the great prestige of literature written in the Turkic language (Old Uzbek), began to encourage scholars to study this language. They considered it an important task to translate the brilliant works of Navoi and Babur and make them accessible to Persian-speaking audiences.

The fame of the translation of the Boburnoma was also due to the beautiful illustrations adorning its manuscripts. At Akbar Shah's court, 104 artists worked regularly. The translator Abdurahimkhan himself was also involved in drawing. Dozens of books were illustrated at Akbar's court. The miniatures created for the Persian versions of the Boburnoma are regarded as outstanding examples of Eastern painting art.

By the beginning of the 19th century, the Boburnoma had become known to the scholarly community throughout Europe. In the global recognition of Babur's legacy, English orientalists played a particularly significant role. They took the lead not only in translating and publishing the Boburnoma, but also in researching and promoting it. Translators based their work on both the Uzbek and Persian versions of the text.

W. Erskine wrote a substantial introduction to the book, in which he introduced Babur and his work to English readers:"Among the rulers of Asia, we rarely encounter individuals as brilliant and talented as Babur. His intellectual vitality, sense of humor and composure, resilience in the face of the tricks of cruel fate, generosity rarely seen among kings, bravery, giftedness, and passionate engagement with science and art make Babur unmatched among the monarchs of Asia."In 1921, the Boburnoma was published for the second time in multiple volumes by Oxford University Press. In this edition, Professor L. Kieft of Dublin University wrote a foreword providing information about the various editions of the Boburnoma, its manuscript versions held in global collections, its translations, and edited the English version.

In the scholarly essay that makes up half of the first volume, the history and geography of Mawarannahr and Khorasan are extensively covered, along with detailed descriptions of cities mentioned by Babur, such as Samarkand, Andijan, Ura-Tyube, Kabul, and others, highlighting their current condition. Another noteworthy quality of this publication is the abundance of annotations and commentaries in the footnotes, provided to ensure the scientific accuracy of the translation. The book also indicates to whom the poems belong and in which language they were originally written. Furthermore, the dissemination of Babur's works in Turkey owes much to the efforts of the prominent scholar Rashid Rahmat Orat. A number of specialized monographs dedicated to the study of Babur's life and literary legacy in English have also been produced.

The meanings of several words used in modern Uzbek literary language differ from their meanings during the era of Old Uzbek. For example, the word qopur had meanings such as "to erect," "to restore," "to remove," and "to stir up." Its root qop was used in ancient Turkic with the meanings "to rise" or "to fly."

In the Boburnoma, the term qishloq (village) appears in its original lexical sense, different from its modern usage—it meant "a house or dwelling place for wintering." For instance: “It is necessary to build a winter dwelling in the fortress... For several days, they stayed on the steppe until the winter houses were ready.” In ancient Turkic, qishlaq meant “a place for wintering.” The word qishloq is derived by adding the suffix -la to the root qish (winter), and then the suffix -gh to form a noun. It referred to “a place where people leave for the fields in summer and return to live in winter.”

Today, the term refers to a settlement whose population is primarily engaged in agriculture. The use of the word qishloq in the sense of “a house for wintering” provides insight into the transformation of this term from an object or dwelling designation in Old Uzbek literary language to an administrative-territorial term.

A number of words used in the language of the Boburnoma have become archaisms. The nature of such words can be explained through the following examples:The word ilik is an archaic term that meant "hand." From this, the verb ilikla was derived, meaning "to seize" or "to take possession of." For example:“We assigned the beks and young men to go and take over the summer fortresses of Yor either through negotiation or by force...”The terms charga and jarga referred to a “circle,” “ring,” or “enclosure,” and also meant “to encircle” or “to surround.” For instance:“The hunters formed a circle and drove the deer down from the mountain.”These terms were also used metaphorically. For example:“We shall remove the one who has committed treason from the circle of office and exile him from the region and district.”Here, mucha means “office” or “rank,” and mucha chargasi refers to the “sphere of authority” or “circle of duty.”

Other English and American scholars who studied the history of Eastern peoples also gave high praise to Babur’s personal abilities and accomplishments. A renowned contemporary Orientalist, J.L. Bonté-Grammont, produced a new French translation of the Boburnoma. He visited our country several times and became closely acquainted with the lifestyle and history of the Uzbek people.

In 1912, Togay Murad Qorluq Khatloniy translated the Boburnoma into Persian once again. This manuscript translation is currently preserved in the manuscript collection of the Institute of Oriental Studies named after Abu Rayhan Beruni at the Academy of Sciences of the Republic of Uzbekistan.

Between 1944 and 1946, the work was translated into Ottoman Turkish and published in two volumes in Ankara. In Russia, the Boburnoma had appeared much earlier. At the end of the 19th century, certain excerpts from the Boburnoma were partially introduced to Russian readers through the translations of I. Pantsov, S. Polyakov, and V. Vyatkin. However, a complete Russian translation had not yet been produced.

This honorable and noble task was undertaken by the skilled translator and scholar M. Salye, and the work was published in Tashkent in 1958. M. Salye devoted more than ten years of labor to this translation, thoroughly studying the language of the text. He successfully preserved Babur's "manly style" of writing and provided the transcription of a vast number of terms, phrases, and names.

Nonetheless, many ambiguities remain in Salye's translation. A number of names in the Boburnoma are rendered incorrectly. For instance, Ahmad Mirzo's beloved Qutluqbegim appears as "Katak Begim"; and words like bukhalaamun ("chameleon") and mucha ("rank/office") were presented without translation or explanation, making them unclear to the Russian reader. Most of the shortcomings in the translation and publications stem from the need for a scholarly critical edition of the text.Шунга ўхшаш талай ноаниқликларни бартараф этиш учун "Бобурнома"нинг энг эътиборли қўлёзма нусхаларини чоғиштириб, унинг илмий матнини тайёрлаш зарур эди. Ниҳоят, бу ишни япониялик бобуршунос олимлар амалга оширдилар. Асарнинг танқидий матни яратилиб, нашр этилди.

It is evident that the life and work of Mirzo Babur are being studied in various countries and are becoming a means of international scholarly cooperation. This also serves as a sign of the great talent and pride of the Uzbek people. Every nation has its great kings, renowned scholars, and prominent writers and poets who define its historical and cultural identity. Among such great figures of world literature stands Zahiriddin Muhammad Babur, who rightfully holds his place.

In the history of mankind, individuals possessing such extraordinary personal potential, talent, and virtues as Babur are exceedingly rare. Babur was a great king, a classical poet, a literary theorist, a jurist, a linguist, an art expert, and an ethnographer, as well as a scholar of the animal and plant worlds—his work and creativity spanned many diverse fields.

Muhammad Babur was a courageous and resourceful individual. Among cultured and charismatic people, Babur was one of the most accomplished. He was far removed from narrow-mindedness and careerism.

What makes Zahiriddin Muhammad Babur's Boburnoma particularly noteworthy as a historical and literary source is that it contains information about numerous historical figures, place names, representatives of literature and art, religious leaders, kings and princes, beks, emirs, and nobles. In the Boburnoma, several hundred historical personalities are depicted, along with descriptions of their activities and adventures.

In the Boburnoma, great importance is given to figures of science, art, and literature. Babur provides information about a number of poets and artists such as Navoi, Jami, Binoiy, Muhammad Solih, Hiloliy, Sayfi Bukhariy, Mir Husayn, Muammoniy, Shaykhim Suhayliy, Yusuf Badavaniy, Ahmad Khojibek, Behzod, Sultan Ali, Hoji Abdullah Marwariy, Shah Muzaffar, Ghulom Shodiy, and Husayn Udiy. He praises them, quotes samples from their works, and at times shares interesting observations about their lives, activities, or personal qualities.

In conclusion, it is worth emphasizing that the Boburnoma plays a significant role in studying the lives and contributions of these individuals, as well as in determining their place in the cultural history of their time. As a result, we become acquainted with the statesmen and cultural figures who lived during Babur's era and held an important place in our history and spiritual heritage. The events of each year are recorded separately in the work. All of the valuable information and reflections provided in the Boburnoma are of great importance to historical research. Thus, it becomes clear that the Boburnoma is a crucial source for studying the events that took place across the three major regions during the late 15th and early 16th centuries. According to researcher M. Abdullaeva, who studied the work, a total of 1,540 individuals are mentioned by name in the Boburnoma. Of these, 357 are historical figures from the region of Mawarannahr. The remaining names belong to historical personalities who lived in different periods and countries. In the narrative of each historical event, either before or during its description, there is often a digression to depict the location where the event took place.

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NARXLARNING SHAKLLANISHI: NAZARIY ASOSLAR

Annotatsiya: *Mazkur maqolada narxlarning shakllanishiga oid nazariy asoslar hamda ularning iqtisodiyotga ta’siri tahlil qilinadi. Bozor talab va taklifi, klassik iqtisodiy nazariya, marginalizm, bozor tuzilmalari (raqobat, monopoliya, oligopoliya) va inflyatsiya kabi tushunchalar orqali narx shakllanishining mohiyati yoritilgan. Shuningdek, narxlar orqali iqtisodiy muvozanat, resurslar taqsimoti va davlat aralashuvining roli ko‘rib chiqiladi. Ushbu ilmiy maqola iqtisodiy siyosatni ishlab chiqishda zarur bo‘lgan nazariy bilimlarni taqdim etadi.*

Kalit so‘zlar: *narx shakllanishi, bozor nazariyasi, talab va taklif, klassik iqtisodiyot, marginalizm, bozor tuzilmasi, raqobat, monopoliya, oligopoliya, inflatsiya, iste’mol narxlari indeksi, iqtisodiy muvozanat, resurslar taqsimoti, davlat aralashuvi.*

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PRICE FORMATION: THEORETICAL FOUNDATIONS

Annotation: *This article explores the theoretical foundations of price formation and its impact on the economy. It examines key economic concepts such as supply and demand, classical economic theory, marginalism, market structures (competition, monopoly, oligopoly), and inflation. The study also discusses the role of prices in maintaining economic equilibrium, resource allocation, and the state's involvement in market processes. The article offers essential theoretical insights valuable for developing effective economic policy.*

Keywords: *price formation, market theory, supply and demand, classical economics, marginalism, market structure, competition, monopoly, oligopoly, inflation, consumer price index, economic equilibrium, resource allocation, government intervention.*

Kirish

Narxlar iqtisodiyotning asosi bo‘lgan elementlardan biri bo‘lib, ular iqtisodiy jarayonlarning qanchalik samarali ishlashini belgilaydi. Ularning shakllanishi bozor muvozanatining ta'minlanishi, resurslarning to‘g‘ri taqsimlanishi va iste'molchilarning iqtisodiy qarorlarining qabul qilinishida muhim rol o‘ynaydi. Narxlar orqali iqtisodiyotning turli segmentlari o‘zaro bog‘lanadi, iqtisodiy o‘sish

va barqarorlikka erishish uchun zarur bo‘lgan muvozanatni saqlaydi. Shuningdek, ular iqtisodiy jarayonlarning tahlilida va strategik qarorlar qabul qilishda muhim ko‘rsatkichlar sifatida xizmat qiladi.

Ushbu maqolada narxlarning shakllanishiga oid nazariy asoslar va ularning iqtisodiyotga ta'siri ko‘rib chiqiladi. Narxlarning qanday shakllanishi, ularning iqtisodiy tizimdagi o‘rni va bozor faoliyatiga qanday ta'sir ko‘rsatishi, iqtisodiy o‘sish va barqarorlikni ta'minlashdagi rolini batafsil tahlil qilish maqsad qilingan. Iqtisodiy nazariyaning asosiy qoidalari va tushunchalari orqali narxlarning shakllanish jarayoni ochib beriladi, bozor muvozanatining qanday saqlanishi va resurslarning qanday taqsimlanishi ko‘rsatiladi.

Narxlarning shakllanishi iqtisodiy tizimlarning qanday ishlashini va ularning qanday qilib resurslarni samarali taqsimlashini tushunishda muhimdir. Bozor talab va taklifining o‘zaro ta'siri, narxlarning qanday qilib bozor muvozanatini saqlash uchun ishlatilishi va iqtisodiy agentlarning qarorlariga ta'siri bu maqolaning markazida bo‘ladi. Shuningdek, iqtisodiy nazariyaning tarixiy rivojlanishi va zamonaviy iqtisodiy tahlilning asosiy tamoyillari narxlarning shakllanishidagi muhim omillar sifatida ko‘rib chiqiladi.

1. Narxlarning nazariy asoslari

Bozor nazariyasi iqtisodiyotning fundamental tushunchalaridan biri bo‘lib, u bozorlarning qanday ishlashini, narxlarning shakllanishini va iqtisodiy resurslarning taqsimlanishini tushunishga yordam beradi. Bu nazariya, iqtisodiy faoliyatni tahlil qilishda va iqtisodiy siyosatni ishlab chiqishda asosiy rol o‘ynaydi. Bozor nazariyasiga ko‘ra, narxlar bozor talab va taklifining o‘zaro ta'siri orqali shakllanadi.[29] Agar talab taklifdan yuqori bo‘lsa, narxlar oshadi; aksincha, agar taklif talabdan yuqori bo‘lsa, narxlar tushadi. Bu jarayon bozor muvozanatini saqlash uchun zarur bo‘lgan narxni belgilaydi.

Klassik iqtisodiyot nazariyasi iqtisodiyotning asosiy nazariyalaridan biridir va 18-asr oxiri va 19-asr boshlarida rivojlangan. Bu nazariya iqtisodiy tushunchalar, bozor mexanizmlari va iqtisodiy siyosatga oid muhim qarashlarni o‘z ichiga oladi. Klassik iqtisodiyot nazariyasining asosiy vakillari Adan Smit, David Ricardo va J.B. Say kabi iqtisodchilardir.

Adan Smitning “Invisible Hand” (ko‘rinmas qo‘l) konsepsiyasi bozor iqtisodiyotining o‘zini-o‘zi tartibga solish qobiliyatini ifodalaydi.[30] Smitga ko‘ra, individual xaridorlar va sotuvchilar o‘z manfaatlarini ko‘zlab harakat qilsa, bozor orqali resurslar samarali taqsimlanadi va umumiy farovonlik oshadi.

Bundan tashqari klassik iqtisodiyot nazariyasida bepul bozor tizimi (free market system) iqtisodiy faoliyatni boshqarishning eng samarali usuli deb hisoblanadi. Bu tizimda davlat aralashuvi minimal bo‘lib, bozorning o‘z-o‘zini tartibga solish qobiliyati asosiy rol o‘ynaydi.

Marginalizm nazariyasi iqtisodiyotda asosiy tushunchalardan biri bo‘lib, u iqtisodiy qarorlar qabul qilish va resurslarni taqsimlashda marginal qiymat

[29] Mankiw, N. G. *Principles of Economics*, Cengage Learning, 2020.
[30] Smith, A. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations*. W. Strahan and T. Cadell.

(qo‘shimcha qiymat) tushunchasiga asoslanadi. Marginalizm 19-asrda rivojlanib, zamonaviy mikroiqtisodiyotning asosiy poydevorini yaratdi. Ushbu nazariya iste'mol, ishlab chiqarish, va bozor muvozanatiga oid jarayonlarni tushuntirishda qo‘llaniladi.

Marginal qiymat - bu qo‘shimcha bir birlik mahsulot yoki xizmat iste'mol qilinishidan yoki ishlab chiqarilishidan olinadigan qo‘shimcha qiymatni ifodalaydi.[31] Iste'molchilar va ishlab chiqaruvchilar qarorlarini marginal qiymat asosida qabul qiladilar. Masalan, agar bir iste'molchi qo‘shimcha bir birlik mahsulotning marginal qiymati uning narxidan yuqori bo‘lsa, bu mahsulotni iste'mol qiladi. Shu bilan birga, ishlab chiqaruvchi qo‘shimcha bir birlik mahsulotning marginal qiymati uning marginal xarajatidan yuqori bo‘lsa, mahsulotni ishlab chiqaradi.

Marginal foyda - bu qo‘shimcha bir birlik mahsulot yoki xizmat iste'mol qilishdan olinadigan qo‘shimcha foydani anglatadi. Iste'molchilar qanday mahsulotlarni yoki xizmatlarni iste'mol qilishlarini tanlashda marginal foyda va uning narxini taqqoslaydilar. Agar marginal foyda narxdan yuqori bo‘lsa, iste'molchi qo‘shimcha bir birlik mahsulotni iste'mol qiladi.

Marginal xarajat - bu qo‘shimcha bir birlik mahsulot ishlab chiqarish uchun zarur bo‘lgan qo‘shimcha xarajatni ifodalaydi. Ishlab chiqaruvchilar ishlab chiqarish miqdorini oshirish yoki kamaytirishda marginal xarajatlarni hisobga oladilar. Agar marginal xarajat marginal foydadan yuqori bo‘lsa, ishlab chiqaruvchi qo‘shimcha mahsulot ishlab chiqarishni to‘xtatadi.

2. Narxlarning shakllanish jarayonlari

Narxlarning shakllanish jarayonlari iqtisodiy tizimlarda resurslarning taqsimlanishi va bozorning samarali ishlashini ta'minlash uchun muhim ahamiyatga ega hisoblanadi. Narxlar iqtisodiy faoliyatni boshqarishning asosiy mexanizmlaridan biri bo'lib, ular talab va taklif o'rtasidagi muvozanatni saqlaydi.

Narxlarning shakllanishida talab va taklif asosiy rol o‘ynaydi. Talab iste'molchilar tomonidan mahsulot yoki xizmatga bo‘lgan ehtiyoj va qiziqishni ko‘rsatadi. Taklif esa ishlab chiqaruvchilar tomonidan bozorga chiqarilgan mahsulot yoki xizmat miqdorini anglatadi. Talab va taklif o‘rtasidagi muvozanat narxlarni belgilaydi.

Talab - bu iste'molchilarning ma'lum bir narxda va ma'lum bir vaqt davomida mahsulot yoki xizmatga bo‘lgan ehtiyoj va istakdir. Talab odatda narx va miqdor o‘rtasidagi munosabatni ifodalaydi va uning asosiy tamoyillari quyidagilardan iborat:

- **talab qonuni:** Talab qonuni shuni bildiradiki, boshqa barcha omillar barqaror bo‘lsa, mahsulot narxi oshsa, talab kamayadi, va mahsulot narxi tushsa, talab oshadi. Bu teskari munosabat talab egri chizig‘ida (demand curve) ko‘rsatiladi.
- **talab egri chizig‘i:** Talab egri chizig‘i narx va talab qilingan miqdor o‘rtasidagi munosabatni ko‘rsatadi. Bu egri chiziq odatda pastga qarab egilgan

[31] Jevons, W. S. (1871). *The Theory of Political Economy*. Macmillan.

bo‘ladi, bu narx oshganida talabning kamayishini va narx tushganida talabning oshishini anglatadi.

Talabga ta'sir etuvchi omillar:

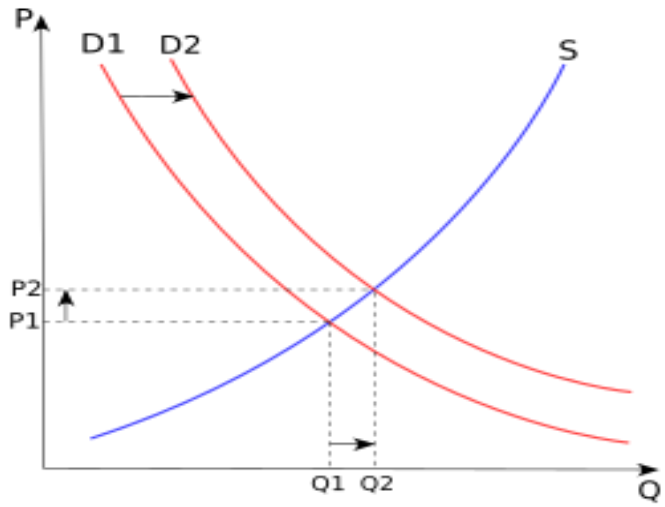
- **narx:** narxning o‘zgarishi talab miqdorini bevosita ta'sir qiladi.
- **daromad:** Iste'molchilarning daromadlari oshishi, agar mahsulot normal bo‘lsa, talabni oshiradi. Inferior mahsulotlar uchun daromad oshishi talabni kamaytirishi mumkin. Inferior mahsulotlar daromad oshganida talab kamayadigan mahsulotlar. Bunday mahsulotlar daromad darajasi pastroq bo‘lgan iste'molchilar uchun mo‘ljallangan bo‘lib, daromad oshishi bilan ular o‘rniga yaxshiroq yoki qimmatroq mahsulotlarga o‘tishadi.
- **mahsulot xususiyatlari**: Mahsulotning sifatiga va brendiga bog‘liq bo‘lgan xususiyatlar talabni oshirishi yoki kamaytirishi mumkin.
- **qo‘shni mahsulotlar**: Substitutlar va komplementar mahsulotlar talabga ta’sir qiladi. Masalan, avtomobillar uchun benzinning narxi oshsa, avtomobillarga talab kamayishi mumkin.
- **kutilgan narx o‘zgarishlari**: Agar iste'molchilar kelajakda mahsulotning narxi oshishini kutsa, hozir ko‘proq xarid qilishlari mumkin.

Taklif - bu ishlab chiqaruvchilar tomonidan ma'lum bir narxda va ma'lum bir vaqt davomida bozorga chiqarilgan mahsulot yoki xizmat miqdoridir. Taklifning asosiy tamoyillari quyidagilardan iborat:

- **taklif qonuni:** taklif qonuni shuni bildiradiki, boshqa barcha omillar barqaror bo‘lsa, mahsulot narxi oshganda, taklif oshadi, va mahsulot narxi tushganda, taklif kamayadi. Bu to‘g‘ri munosabat taklif egri chizig‘ida ifodalanadi.
- **taklif egri chizig‘i:** taklif egri chizig‘i narx va taklif qilingan miqdor o‘rtasidagi munosabatni ko‘rsatadi. Bu egri chiziq odatda yuqoriga qarab egilgan bo‘ladi, bu narx oshganida taklifning oshishini va narx tushganida taklifning kamayishini anglatadi.

Taklifni ta'sir etuvchi omillar

- **narx:** narxning o‘zgarishi taklif miqdorini bevosita ta'sir qiladi.
- **ishlab chiqarish xarajatlari**: xom ashyo, ish haqi, energiya va boshqa ishlab chiqarish xarajatlari taklifni ta'sir qiladi. Xarajatlar oshishi taklifni kamaytiradi, kamayishi esa taklifni oshiradi.
- **texnologiya**: yangi texnologiyalar ishlab chiqarish samaradorligini oshirishi mumkin, bu taklifni oshiradi.
- **bozor kirish va chiqish charoitlari:** Bozorga yangi ishlab chiqaruvchilar kirishi taklifni oshiradi, aksincha, bozorga kirish qiyinlashsa yoki mavjud ishlab chiqaruvchilar chiqsa, taklif kamayishi mumkin.
- **davlat siyosati:** Davlat siyosati, masalan, soliqlar va subsidiya, taklifni ta'sir qiladi. Masalan, subsidiya taklifni oshirishi mumkin.



S- taklif
D-Talab
P-mahsulot narxi
Q-mahsulot miqdori

Bundan tashqari o‘zbek olimlari ham O’zbekistondagi iqtisodiy jarayonlar va narxlarning shakllanishi borasida muhim izohlarni berishgan. Jumladan, iqtisod fanlari doktori Komiljon Maxmudov shunday ta’kidlaydi:[32] “Narxlar – iqtisodiyotda talab ва taklif o'rtasidagi asosiy bog'lovchi bo'g'indir. O‘zbekistonda bozor mexanizmi tobora shakllanib, davlatning bevosita aralashuvi kamaymoqda, shuningdek, energetika va transport sohasida davlatning rolini saqlab qolish orqali barqarorlikni ta’minlash maqsadga muvofiqdir”.

“Narxlar va bozor muvozanati” bo'yicha iqtisodchi Baxodir Abduraxmonov shunday deydi:[33] “O‘zbekistonda bozor muvozanatini saqlashda narxlarning talab va taklifga nisbatan moslashuvchanligi muxim rol o‘ynaydi. Davlatning iqtisodiy siyosatida narxlarni turg‘unlashtirish choralari ko‘rilayotgan bir vaqtda, ishlab chiqarish samaradorligini oshirish va ichki raqobatni rivojlantirish orqali barqaror narx shakllanishiga erishish zarur”

“Narx shakllanishida davlat aralashuvi va bozorning o‘zini-o‘zi boshqarish imkoniyatlari” hakida iktisodiyot fanlari doktori, professor Rustam Jo‘rayev:[34] «O‘zbekistonda davlat iqtisodiy islohotlar yo‘lida bozor mexanizmlarini rivojlantirishga katta e'tibor bermoqda. Biroq, ayrim sektorlar, xususan, oziq-ovqat va energetika sohalarida narxlarning barqarorligini ta'minlash uchun davlat aralashuvi zarur. Bozor iktisodiyotida davlatning asosiy vazifasi bozor muvozanatini saqlashga ko‘maklashishdir”.

3. Bozor tuzilmasi

Bozor tuzilmasi iqtisodiy faoliyat va raqobatning qanday shakllanishini aniqlaydigan muhim tushuncha hisoblanadi. Bozor tuzilmasi ishlab chiqaruvchilar

[32] Maxmudov, K. (2022). *Bozor iqtisodiyoti va narx mexanizmi*, Toshkent: Iqtisodiyot nashriyoti.
[33] Abduraxmonov, B. (2023). *O‘zbekiston iqtisodiyoti: muvozanat va rivojlanish omillari*, TDIU nashriyoti.
[34] Jo‘rayev, R. (2021). *Davlat aralashuvi va bozor mexanizmlari: muvozanatni izlab*, O‘zbekiston Fanlar Akademiyasi.

va iste'molchilar o'rtasidagi munosabatlarni, narxlarning qanday belgilanishini va bozor samaradorligini ta'sir qiladi. Turli bozor tuzilmalari bozor dinamikasi va iqtisodiy samaradorlikni belgilashda muhim ahamiyatga ega.

Bozor tuzilmasi — bu bozorning qanday tashkil etilganligini va undagi iqtisodiy agentlarning (ishlab chiqaruvchilar, iste'molchilar) o‘zaro munosabatlarini ifodalaydi. U bir qator omillar bilan belgilanadi, jumladan:

- **bozorning raqobat muhiti**: bozorda necha ta ishlab chiqaruvchi mavjudligi va ularning bir-biriga ta'siri.
- **mahsulotning turliligi**: mahsulotlarning sifat va xususiyatlari qanday farqlanishi.
- **bozorga kirish imkoniyatlari**: yangi raqobatchilar bozorga kirishdagi qiyinchiliklar va imkoniyatlar.
- **narx belgilash siyosati**: mahsulotlar narxining qanday belgilanishi va o'zgarishi.

Bozor tuzilmasi bir necha asosiy turlarga bo‘linadi. Har bir tur o‘ziga xos xususiyatlari va iqtisodiy natijalari bilan ajralib turadi:

To‘liq raqobat bozor tuzilmasi, ko‘plab ishlab chiqaruvchilar va iste'molchilar mavjud bo‘lgan bozorni ifodalaydi. Mahsulotlar bir-biriga o‘xshash bo‘ladi (homogen mahsulotlar), va har bir agent bozor narxini ta'sir qilmaydi.

Monopoliya

Monopol bozor tuzilmasida bitta ishlab chiqaruvchi bozorni to‘liq nazorat qiladi va mahsulotning yagona ta'minotchisi hisoblanadi. Boshqa raqobatchilar bozorga kirish imkoniyatiga ega emas.Jumladan, yagona sotuvchi, mahsulot o‘ziga xos bo‘lishi mumkinligi, bozorga kirish to‘sqinliklar bilan cheklanganligi va sotuvchi narxlarni belgilaydi.

Oligopoliya

Oligopol bozor tuzilmasida bozorni bir nechta katta ishlab chiqaruvchi yoki sotuvchi nazorat qiladi. Bu ishlab chiqaruvchilar bozor narxlariga ta'sir ko‘rsatishi mumkin. Masalan, kam sonli sotuvchilar, mahsulotlar o‘xshash yoki farqlanishi mumkin, bozorga kirish qiyin bo‘lishi mumkin, raqobat va narxlar strategiyasi sotuvchilar o‘rtasida muvozanatlashadi.

Inflatsiya

Inflatsiya iqtisodiyotda narxlarning umumiy darajasining oshishi bilan tavsiflanadi. U pulning qadrsizlanishini va iqtisodiy tizimdagi umumiy narxlar darajasining oshishini anglatadi. Inflatsiya iqtisodiy barqarorlikni ta'minlashda, siyosiy qarorlar va iqtisodiy strategiyalarni ishlab chiqishda muhim rol o‘ynaydi.

Iste’mol narxlari indeksi (keyingi o’rinlarda INI deb yuritiladi) iste’mol sektorida inflyatsiya darajasini aks ettiruvchi muhim ko’rsatkichlardan biri hisoblanadi hamda davlatning moliya va pul-kredit siyosatini amalga oshirishda, iqtisodiyotda narx jarayonlarini tahlil va prognoz qilishda, aholiga eng kam ijtimoiy kafolatlarni qayta ko‘rib chiqishda, ayrim huquqiy bahs-munozaralarni hal etish va hokazolarda foydalanilishi mumkin.

INI inflyatsiya darajasini ifodalaydigan muhim ko‘rsatkichlardan biri bo‘lib, bu o‘rtacha iste’molchi tomonidan ishlab chiqarish bilan bog‘liq bo‘lmagan

iste’mol uchun sotib olingan tovarlar va xizmatlar majmui qiymatining umumiy o‘zgarishini hisoblaydi, ya’ni, ma’lum davr mobaynida, tovarlar va xizmatlar iste’moli miqdorining o‘zgarmas bo‘lgan holatida, aholining iste’mol xarajatlari umumiy miqdorining o‘zgarishini ifodalaydi. INIda, mamlakatning barcha hududlari bo‘yicha turli tovarlar va xizmatlar narxlarining harakati o‘rtacha darajaga keltiriladi.

INIni hisoblash, narxlar kuzatuvi metodologiyasi va instrumintariysini ishlab chiqish hamda takomillashtirish, shuningdek, INIni bevosita hisoblash O‘zbekiston Respublikasi Prezidenti huzuridagi Statistika agentligi tomonidan amalga oshiriladi. Hududiy statistika boshqarmalari tomonidan shaharlar va tumanlar, savdo va xizmat ko‘rsatish obyektlari, shuningdek, aniq tavsifga ega tovarlar va xizmatlar tanlovi, ro‘yxatga olish hamda birlamchi ma’lumotlar tahlilini nazoratga olgan holda ma’lumotlar bazasini shakllantirish va uni elektron tarzda taqdim etish bo‘yicha ishlarni amalga oshiradi.

Xulosa

Narxlarning shakllanishi iqtisodiyotning muhim va murakkab jarayonlaridan biridir. Bu jarayon bozor talab va taklifining o‘zaro ta'siri orqali amalga oshiriladi, va narxlar iqtisodiy tizimdagi resurslarning taqsimlanishini, ishlab chiqarish va iste'mol qarorlarini shakllantirishda muhim rol o‘ynaydi. Narxlarning shakllanishi bozor mexanizmlarini va iqtisodiy siyosatni tushunishda, iqtisodiy o‘sish va barqarorlikni ta'minlashda muhim ahamiyatga ega.

Maqolada ko‘rib chiqilgan nazariy asoslar, jumladan bozor nazariyasi, klassik iqtisodiyot nazariyasi va marginalizm, narxlarning shakllanishidagi asosiy prinsiplarni va tushunchalarni aniqlashda yordam beradi. Bozor talab va taklifining o‘zaro ta'siri, klassik iqtisodiyot nazariyasining “ko‘rinmas qo‘l” konsepsiyasi, va marginal qiymat tushunchasi orqali iqtisodiy agentlarning qaror qabul qilish jarayonlarini yoritish, narxlarning qanday shakllanishini va ularning iqtisodiy jarayonlarga qanday ta'sir ko‘rsatishini tushunishga imkon beradi.

Bozor tuzilmasining turli turlari, masalan, to‘liq raqobat, monopol, oligopol va monopolistik raqobat, narxlarning shakllanishiga va bozor samaradorligiga turlicha ta'sir ko‘rsatadi. Har bir bozor tuzilmasi o‘ziga xos iqtisodiy dinamikaga ega bo‘lib, narxlar va resurslarning taqsimlanishi muvozanatining qanday saqlanishiga ta'sir qiladi. Masalan, to‘liq raqobat bozorida narxlar bozor tomonidan belgilanishi va resurslar samarali taqsimlanishi mumkin, ayni paytda monopol va oligopol bozorlarida esa narxlarning belgilanishi va resurslarning taqsimlanishi bozorning samaradorligiga ta'sir qilishi mumkin.

Narxlar, shuningdek, iste'molchilarning xarid qilish qarorlariga ta'sir ko‘rsatadi, yuqori narxlar iste'molchilarni narxlarni pastroq bo‘lgan mahsulotlarga o‘tkazishga majbur qiladi. Shu bilan birga, inflatsiya iqtisodiyotdagi narxlarning umumiy darajasining oshishi bilan tavsiflanadi va iqtisodiy barqarorlikni ta'minlashda muhim rol o‘ynaydi. Inflatsiya darajasini tahlil qilish, davlat siyosatining samaradorligini baholashda va iqtisodiy strategiyalarni ishlab chiqishda muhim omil hisoblanadi.

Narxlarning shakllanishi va iqtisodiy jarayonlarga ta'siri haqida chuqur tushunchaga ega bo‘lish, iqtisodiy faoliyatni samarali boshqarish uchun zarurdir. Ushbu maqola narxlarning shakllanishi nazariy asoslari va iqtisodiy jarayonlarga ta'sirini keng qamrovli tahlil qilish orqali, iqtisodiy siyosat va strategiyalarni ishlab chiqishda qo‘llaniladigan muhim bilimlarni taqdim etdi. Narxlarning shakllanishi va iqtisodiy tizimlarning o‘zaro aloqalari haqida yaxshiroq tushuncha, iqtisodiy barqarorlikni ta'minlash, resurslarning samarali taqsimlanishi va bozor muvozanatini saqlashda yordam beradi.

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TECHNOLOGY OF EXTRACTION OF FLUID FROM OIL AND GAS

Annotation: *The rapid development of the oil and gas industry and the introduction of various techniques and technologies are increasing the demand for petroleum products. The article reviews the huge construction works carried out in the country on the production of oil-containing associated gases and rare products from natural gas and the prospects for the production of liquefied fuel.*

Key words: *sustainable gasoline, liquefied, synthetic fuel, GTL technology, associated gases, fractionation of gas, condensation, and cracking of gas.*

Currently, the country is working on implementing new stages of development of the oil and gas industry, the application of advanced technologies based on deep processing of raw materials, their complex development, the development of alternative energy sources, localization of production and the development of export products based on the requirements of the world market. The main prospective direction is the possibility of launching torches using small-sized devices, utilizing satellite oil gases and directly obtaining gaseous methane fuel, stable gasoline and a liquid mixture of propane-butane fraction.

A number of scientific and practical developments have been carried out with the technology of liquefied natural gas production in the USA, Russia, Germany, China, including the Republic of Uzbekistan. Shu jumladan suyultirilgan tabiiy gazlarni olish texnologiyasi va qurilmalarini ishlash bo‘yicha bir qator Gritsenko A.I., Zakirov S.N., Zemenkov Y.D, Markova L.M, Proxorov A.D, Dudin S.M., Lutoshkin G.S., Klimova G.N., Litvak V.V., Yavorskiy M.I., Kislenko N.N., Nenaxov V., Rachevskiy B.S., Ryabsev N.I., Stepanov O.A. va Chirikov K.Y. kabi olimlar shug‘ullanishgan.

In particular, a number of scientists such as Gritsenko A.I., Zakirov S.N., Zemenkov Y.D., Markova L.M., Prokhorov A.D., Dudin S.M., Lutoshkin G.S., Klimova G.N., Litvak V.V., Yavorskiy M.I., Kislenko N.N., Nenakhov V., Rachevskiy B.S., Ryabsev N.I., Stepanov O.A. and Chirikov K.Y. were engaged in the development of technology and equipment for the production of liquefied natural gases. The oil and gas industry in the Republic of Uzbekistan is a multi-sector industry, forming a vertical-integration system in its composition, controlling the network from the bottom of the well to the customer. Ensuring the stability of such a large-capacity system requires training and education of highly qualified specialists.

Producing synthetic liquid fuels from natural gas is very cost-effective, and it's cheaper to transport than natural gas: it costs 30% to 50% of the cost of the

finished product to transport it. When the gas is directly converted to liquid components in the mine itself, the capital cost of processing it is dramatically reduced. With current technologies of natural gas processing, it is possible to obtain high-quality gasoline and diesel fuel through the methanol production step [1].

Commercial use of GTL-based fuels depends on two main factors: the price of the oil needed to build the refinery and the size of the investment. The first factor ?? price is formed on the world market, the second factor is the subject of the analysis of the investment for the construction of the GTL plant, the technical-economic calculations and the risk.

It should be noted that the market for the products of the GTL plant is not limited, the price of liquid fuel is constantly rising. There can be no competition or threat from the refining industry for the growth of the GTL project.

The production of high-quality mator fuel components in GTL plants poses the problem of refiners producing higher quality fuel. A GTL facility can be built on the territory of an oil refinery or near a plant that purifies the gas of each component, and the need for refining does not end. In this case, the synthetic liquid fuel can be transferred to the mobile technological installation of the NPP for reprocessing [2].

The condition of the Republic of Uzbekistan is the availability of efficient production of synthetic liquid fuels on the basis of utilization of large amounts of gases released into the atmosphere, and secondly, the maintenance of the purity of atmospheric air. Currently, the processing of low-pressure gas supplied to the torch is carried out on a large scale in the "Shortan oil and gas extraction department" and "Mubarak oil and gas extraction department".

In addition to absorbing liquefied gas from associated gas, it is also isolated on the basis of low-temperature technology. During the processing of associated gases at gas processing plants, methane, ethane and partially propane are obtained from dry gas and its composition, ethane-containing fractions and liquefied gases: propane, butane, isobutane and autobenzene contain stable gas gasoline components [3].

Comparison of associated gas content in oil fields with natural gases from gas and gas condensate fields is given below (Table 1). It can be seen from the information that the content of associated gas in the section of fields is very different from each other and depends on the type of fields and production conditions, liquefied gases are obtained not only from associated gases, but also from gas condensate fields. When gases operate in gas condensate fields under high pressure (100-600 kgf/cm2), oil passes liquid to some components. When the pressure decreases by 40-80 kgf/cm2, condensate is released from it as a result of gas condensation. Condensate contains components of heavy hydrocarbons of gasoline and liquefied gases.

As is known from the refining process, when oil rises up pipelines, part of the associated gas remains in it in a liquid state. The amount of dissolved gas and its composition depend on the operating mode, pressure and temperature of the balance.

Gases contained in the oil are returned to the oil field units for stabilization, and the remaining fractions of methane and butane are additionally obtained. More than half of liquefied petroleum gas is produced during processing at refineries. The refinery gas content for each process has the following classification (Table 1).

Table 1

The average content of associated gases in several oil fields is comparable to the data of gas and gas condensate fields.

number	Location of fields	Depth of occurrence	Component depth								Amount of condensate in gas	Relative density
			CH_4	C_2H_6	C_3H_8	C_4H_{10}	C_5+ from Top	CO_2	H_2+ unique gases	H_2S		
I. Gas condensate fields												
1.	O‘rtabuloq	2185	88,0	1,4	0,37	0,15	0,21	4,7	0,1	4,9	11,6	
2	Zevarda	2610	90	4,5						0,09	78,8	
5	Gazli	97,2	0,32	0,9	0,47	0,13	2,3279	-	-	-	-	
II. Oil and Gas Fields												
6	Janubiy Kemachi	2600	81,5	10,31	3,26	0,73	16	3,25	0,56	0,04	43	
7	Umid	2600	90,87	3,62	0,85	0,32	0,52	3,2	0,55	0,07	56	
III. Oil fields												
8	Shimoliy O‘rtabuloq	4300	88,0	3,910,	0,91	0,6	2,327	3,38	0,7	0,04	78	-
10	Ko‘kdumaloq	2950	78,31	5,0	1,97	0,73	9,48	3,7	0,37	0,08	600	
11	Kruk	2160	84,58	5,96	1.18	0,24	0,396	2.48	0,17	0,13	73	

The thermal cracking process produces a large amount of oliphens. The catalytic process produces a large amount of isobutanes and the pyrolysis process produces a large amount of ethylene and hydrogen. Gas, propane-propylene, butane-butylene fractions are classified as components of the gas extracted from the oil in the plants.

Therefore, the composition of the liquefied petroleum gas depends on the method of production. The accompanying gases are boundary hydrocarbons (propane-butane) when processed in gas processing plants, and in the latter case have a small amount of boundary hydrocarbons (propane-butane). In oil refineries, the concentration of propylene and butylene in the liquefied petroleum gas is dramatically increased.

Installation for the production of propane and higher hydrocarbons:

A scheme for using the Joule-Thomson effect to obtain liquefied petroleum gases is given below. To prevent the formation of hydrates in the gas stream, 80% methanol is injected into the gas stream prior to cooling. After the gas passes through the inlet separator, the recuperative heat exchanger enters T1 and is cooled by the reverse flow of the gas [5]. In this process, the gas is pressurized and cooled to the required pressure to be delivered to the consumers, and then it enters a three-dose C1 separator to separate the liquid that falls into it. The gas accumulates in the boiler after the coolant is fed to the recuperative heat exchanger.

table 2

Description of the satellite oil and gas of the North Ortabuloq field.

№	Name and mass fraction of components, %	Value
1	Hydrogen sulfide	3,89
2	Carbon dioxide ($H_2S + CO_2$)	3,16
3	Nitrogen (N_2)	1,03
4	Methane (CH_4)	51,59
5	Ethane (C_2H_6)	14,78
6	Propane (C_3H_8)	16,40
7	Isobutane (iC_4H_{10})	1,94
8	Normal butane (nC_4H_{10})	4,93
9	Isopentane (iC_5H_{12})	1,09
10	Normal pentane (nC_5H_{12})	1,19
11	Gas density (in relation to air)	0,997

The condensed fraction leaves the main fractional column to the highest boiling point and depends on the boiling point: light primary distillate (-100°C), primary heavy distillate (50-200°C), aviation and domestic kerosene (150-360°C) containing railway and middle distillates of marine diesel fuel (at intermediate temperature), gas oil (175-360° C) Some of them are incoming products and increase LPG emissions [6].

This is due to the economic crisis in the world, a reduction in oil production in the Middle East, its high price, economic depression and a decrease in oil demand. At the same time, the demand for transport fuel increased: motor gasoline, aviation kerosene and diesel fuel. Due to the increased demand for "light oil," the question is now raised about reducing the production of light fractions by increasing the production of distillers and increasing the production of synthetic liquid fuel instead of fuel. To achieve this, additional light cracking stages have been added to the refinery process chain. In this case, the "heavy" fuel leaving the main fraction separation unit is heated to a 450°C.gacha pressure of about 9800 kPa of oil, distillates are pumped into the residual oil, that is, a light cracking resin fraction is obtained. The light cracking process is another type of thermal cracking. It enhances the yield of olefinic series of hydrocarbons with a high cracking content. Based on the point of liquefied gas generation, it increases the emission of low-boiling gases (propane and butane) during light cracking, is a low-saturated product, contains a large amount of propylene and butylene.

In accordance with the adoption of one or two purification conversions as the main cracking of most oil refineries. The technological scheme of the plant determines the yield of liquefied petroleum gas in a wide range Catalytic reforming is the simplest conversion process, and it ensures the release of liquefied petroleum gas. The main goal here is to get the aromatic hydrocarbons C6/C7 or the intermediates or the gasoline mixture. The product of this process is the crude oil obtained by fractional discharge column or a special primary. The main process of conversion of hydrocarbons of paraffin and petroleum rows is the instantaneous dehydrogenation and ring formation of aromatic hydrocarbons in the presence of distillate. These gases, along with other lighter gases, are released during the recovery phase of rapid low-pressure evaporation and enter the reactors as a distillate, filled with a platinum catalyst.

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QORAKO'L QO'YLARINI DUNYO BO'YLAB TARQALISHI VA ULARNI KO'PAYTIRISHDA ZAMONOVIY YONDASHUVLAR

Annotatsiya: *Qorako'l qo'y zoti Markaziy Osiyoga, ayniqsa O'zbekiston hududiga xos bo'lgan noyob genetik resurslardan biri hisoblanadi. Ushbu zot asosan mo'ynali qorako'l terisi uchun qadrlanadi va o'zining ekologik moslashuvchanligi bilan bir necha mamlakatlarda keng tarqalgan. Hozirgi kunda qorako'l qo'ylarini Rossiya, Afg'oniston, Eron, Janubiy Afrika va Namibiya kabi davlatlarda muvaffaqiyatli ko'paytirilmoqda. Maqolada qorako'l zotining global tarqalish geografiyasi, boshqa iqlim sharoitlariga moslashtirilishi va eksport tarixiga to'xtalib o'tiladi. Shuningdek, zamonaviy seleksiya usullari, sun'iy urug'lantirish, genetik saralash, raqamli monitoring va axborot texnologiyalaridan foydalanish orqali zot sifatini yaxshilash imkoniyatlari ko'rib chiqiladi. Xalqaro tajriba va bozor talablaridan kelib chiqqan holda, qorako'lchilikning barqaror rivojlanish istiqbollari alohida tahlil qilinadi.*

Kalit so'zlar: *qorako'l qo'ylari, zotni saqlash, zamonaviy seleksiya usullari*

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WORLDWIDE DISTRIBUTION OF KARAKUL SHEEP AND MODERN APPROACHES TO THEIR BREEDING

Abstract: *The Karakul sheep breed, originally native to Central Asia — particularly Uzbekistan — is recognized as one of the most unique genetic resources in the global sheep industry. Due to the high value of its lamb pelt, Karakul sheep have been widely distributed to various countries, including Russia, Afghanistan, Iran, South Africa, and Namibia. In recent decades, globalization and the advancement of biotechnology have led to renewed interest in preserving and improving this breed. This paper explores the global distribution and adaptation of Karakul sheep to diverse climatic zones, along with the historical background of their exportation. The study also focuses on modern breeding approaches such as artificial insemination, genetic selection, and the integration of digital tools for herd management. Furthermore, international experiences and the prospects for sustainable development of the Karakul sheep industry in the face of climate change and evolving market demands are discussed.*

Keywords: *Karakul sheep, breed conservation, modern breeding methods*

Kirish: Qorakoʻl qoʻy zoti Oʻzbekiston va Markaziy Osiyo hududlarida qadimdan yetishtirilgan va jahon miqyosida noyob genetik resurs sifatida e'tirof etilgan zot hisoblanadi. Ayniqsa, qorakoʻl terisining oʻziga xos tuzilishi, nafisligi va estetik koʻrinishi tufayli bu zot uzoq yillardan buyon iqtisodiy jihatdan yuqori baholanib kelinmoqda. Qorakoʻlchilik Oʻzbekiston chorvachiligining muhim tarmoqlaridan biri boʻlib, nafaqat ichki, balki xalqaro bozorlar uchun ham eksportbop mahsulot yetkazib beruvchi soha hisoblanadi.

Soʻnggi yillarda dunyo miqyosida ekologik muammolar, iqlim oʻzgarishlari va biologik xilma-xillikni saqlab qolish masalalari chorvachilikka, xususan, noyob zotlarni saqlash va rivojlantirishga yangicha yondashuvlarni talab qilmoqda. Zamonaviy biotexnologiyalar, sun'iy urugʻlantirish, genetik seleksiya, raqamli monitoring kabi innovatsion usullar qorakoʻl qoʻylarini koʻpaytirish samaradorligini oshirishda muhim rol oʻynamoqda.

Mazkur maqolada qorakoʻl qoʻylarining tarixiy rivojlanishi, ularning turli mamlakatlarga tarqalish jarayoni, iqlimga moslashuv xususiyatlari va zamonaviy koʻpaytirish texnologiyalarining ahamiyati tahlil qilinadi. Shu bilan birga, xalqaro tajriba asosida qorakoʻlchilik sohasida barqaror taraqqiyotga erishish yoʻllari ham koʻrib chiqiladi.

Adabiyotlar tahlili va metodologiyasi:

Tadqiqot doirasida qorakoʻl qoʻylariga oid mahalliy va xalqaro ilmiy manbalar, statistik ma'lumotlar, FAO (BMT Qishloq xoʻjaligi va oziq-ovqat tashkiloti), Oʻzbekiston Respublikasi Qishloq xoʻjaligi vazirligi, shuningdek, Janubiy Afrika, Rossiya, Namibiya va Eron kabi davlatlarning chorvachilik sohasidagi hisobotlari oʻrganildi. 2000–2024 yillar oraligʻida chop etilgan 50 dan ortiq ilmiy maqolalar va monografiyalarning mazmuniy tahlili asosida qorakoʻl zotining genetik xususiyatlari, ekologik moslashuvchanligi, nasl sifatlarini saqlab qolish va koʻpaytirish boʻyicha ilgʻor tajribalar tahlil qilindi.

Adabiyotlarda qorakoʻlchilik tarixiga oid ma'lumotlar, ularning ilk tarqalish yoʻnalishlari, yangi iqlim sharoitiga moslashtirish usullari va bu jarayonda yuzaga kelgan biologik va iqtisodiy muammolar keng yoritilgan. Shuningdek, seleksiya va naslchilikda zamonaviy usullar — sun'iy urugʻlantirish, genetik monitoring, molekulyar-biologik tahlillar va IT-texnologiyalar asosidagi boshqaruv tizimlari haqida ma'lumotlar tahlil qilindi.

Metodologik yondashuv sifatida tizimli tahlil, qiyosiy tahlil va statistik metodlardan foydalanildi. Qorakoʻl qoʻylarining tarqalgan hududlarida (Oʻzbekiston, Namibiya, Eron, Janubiy Afrika) seleksiya samaradorligini koʻrsatadigan asosiy koʻrsatkichlar solishtirildi. Raqamli axborot manbalarida mavjud boʻlgan interaktiv xaritalar, nasl genetikasi boʻyicha ma'lumotlar bazasi va chorvachilik monitoringi tizimlari orqali amaliy misollar asosida tahlil olib borildi.

Tadqiqotda nazariy manbalar bilan bir qatorda amaliyotchi seleksionerlar, fermer xoʻjaliklari mutaxassislari va qorakoʻl yetishtirish markazlari tajribasi ham inobatga olindi. Bu yondashuv nafaqat adabiy manbalarni ilmiy tahlil qilishni, balki real hayotda qoʻllanilayotgan amaliy usullarning natijadorligini baholash imkonini berdi.

Muhokama: O‘tkazilgan tadqiqotlar shuni ko‘rsatdiki, qorako‘l qo‘ylarini ko‘paytirish va ularning genetik resurslarini saqlab qolishda zamonaviy yondashuvlar muhim ahamiyat kasb etmoqda. An’anaviy chorvachilik uslublari bilan bir qatorda sun’iy urug‘lantirish, genetik seleksiya va raqamli monitoring tizimlari orqali qorako‘l zotining nasl sifatlarini yaxshilashga erishilmoqda. Ayniqsa, ekologik sharoiti murakkab bo‘lgan mintaqalarda yuqori moslashuvchan genotiplarga ega nasllarni tanlab olish, ularni genetik darajada mustahkamlash zamonaviy molekulyar-biologik tahlil metodlari yordamida samarali amalga oshirilmoqda.

Namibiya va Janubiy Afrika tajribasida qorako‘l qo‘ylarini yangi iqlimga moslashtirishda biologik monitoring, oziqlantirish texnologiyalarini o‘zgartirish va hududiy seleksiya ishlari asosiy omillar sifatida ajralib turadi. O‘zbekistonda esa asosan tarixiy genofondni saqlab qolish, nasldor urug‘larni yetishtirish va eksport imkoniyatlarini kengaytirish ustuvor yo‘nalishlardan biridir. Bunda davlat yordami, ilmiy-tadqiqot institutlarining ishtiroki va fermerlar bilan samarali hamkorlik asosida yaxshi natijalarga erishilmoqda.

Boshqa tomondan, ayrim hududlarda qorako‘l zotining degeneratsiyasi, ya’ni nasl sifati pasayishi, seleksiya ishlari va nasl nazoratining sustligi bilan bog‘liq muammolar mavjud. Bu holat, ayniqsa, kichik fermer xo‘jaliklari o‘rtasida tajriba va zamonaviy bilimlarning yetishmasligi bilan izohlanadi. Bu borada veterinariya xizmatlari, genetik laboratoriyalar va agrotexnik maslahat markazlarining keng qamrovli faoliyat yuritishi muhimdir.

Qayd etish joizki, raqamli texnologiyalar, jumladan, chorva monitoringi, genetik pasportlashtirish va naslchilik bo‘yicha onlayn bazalarning joriy etilishi qorako‘lchilikni sifat jihatdan yangi bosqichga olib chiqmoqda. Bu esa ishlab chiqarish samaradorligini oshirish, eksport salohiyatini mustahkamlash va global bozorlardagi raqobatbardoshlikni ta’minlash imkonini beradi.

Shunday qilib, qorako‘l qo‘ylarini ko‘paytirishda zamonaviy yondashuvlar an’anaviy chorvachilik tajribasi bilan uyg‘unlashtirilgan holda, ilmiy asoslangan, iqtisodiy va ekologik jihatdan barqaror tizimni shakllantirishga xizmat qilmoqda.

Natija: O‘tkazilgan tahlillar asosida aniqlanishicha, qorako‘l qo‘ylarini ko‘paytirish va saqlash borasidagi zamonaviy yondashuvlar, xususan, genetika, seleksiya va axborot texnologiyalariga asoslangan choralar bu sohaning jahon miqyosida barqaror rivojlanishini ta’minlashda muhim o‘rin tutmoqda. Turli mintaqalarda olib borilgan amaliyotlar shuni ko‘rsatdiki, sun’iy urug‘lantirish, genetik monitoring va naslchilikka oid zamonaviy yondashuvlar qorako‘l zotining nasl sifati va moslashuvchanligini saqlab qolishda yuqori samaradorlikka ega.

Shuningdek, xorijiy davlatlar tajribasidan foydalanish orqali qorako‘lchilik sohasini modernizatsiya qilish imkoniyati mavjud. Ayniqsa, Namibiya, Janubiy Afrika va Rossiyadagi seleksiya yutuqlari, O‘zbekistonda mavjud mahalliy genofond bilan uyg‘unlashtirilgan holda, xalqaro bozorda raqobatbardosh qorako‘l mahsulotlarini yetishtirishga zamin yaratadi.

Natijalar shuni ko‘rsatadiki, qorako‘l qo‘ylarini saqlash va ko‘paytirishda texnologik yondashuvlar bilan bir qatorda, mahalliy iqlim sharoitiga mos, genetik

barqaror nasllarni tanlab olish, fermerlar va mutaxassislarning uzluksiz bilimini oshirish, ilm-fan va ishlab chiqarish integratsiyasini kuchaytirish zarur. Bu yondashuv orqali qorakoʻlchilik sohasida nafaqat milliy, balki xalqaro darajadagi muvaffaqiyatlarga erishish mumkin.

Xulosa: Qorakoʻl qoʻy zoti nafaqat Oʻzbekiston, balki butun dunyo chorvachiligi uchun muhim genetik resurs hisoblanadi. Ularning noyob biologik xususiyatlari, ekologik moslashuvchanligi va yuqori iqtisodiy qiymati tufayli qorakoʻlchilik sohasi global ahamiyatga ega boʻlib bormoqda. Olib borilgan tahlillar asosida aytish mumkinki, zamonaviy seleksiya va koʻpaytirish texnologiyalarini joriy etish qorakoʻl zotining nasl sifatini saqlash va uni takomillashtirishda muhim omil boʻlib xizmat qilmoqda.

Dunyo tajribasi shuni koʻrsatmoqdaki, qorakoʻlchilikni rivojlantirishda sunʼiy urugʻlantirish, genetik monitoring, raqamli axborot tizimlari, seleksiya dasturlari va ilmiy tadqiqotlarning integratsiyasi muhim oʻrin tutadi. Ayniqsa, Oʻzbekistonda mavjud tarixiy genofondni saqlash, uni xorijiy ilgʻor tajriba bilan uygʻunlashtirish, sohaga zamonaviy menejment va texnologiyalarni tatbiq etish orqali eksportbop mahsulot yetishtirish imkoniyatlari ortib bormoqda.

Shu bois, qorakoʻl qoʻylarini koʻpaytirish va saqlashda kompleks yondashuvni qoʻllash, yaʼni ilmiy-tadqiqot, amaliyot va innovatsion texnologiyalarni birgalikda qoʻllash, kelgusida nafaqat milliy, balki xalqaro chorvachilik tizimida ham barqaror oʻsishni taʼminlaydi.

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BOSHLANG‘ICH SINF O‘QUVCHILARI SO‘Z BOYLIGINI RIVOJLANTIRISHNING PSIXOLINGVISTIK ASOSLARI

Annotatsiya. *Mazkur maqolada boshlang‘ich sinf o‘quvchilari so‘z boyligini rivojlantirish jarayonining psixolingvistik asoslari tahlil qilinadi. So‘z o‘rganish va uni faol nutqda qo‘llashga xos psixik jarayonlarning — idrok, xotira, tafakkur, e’tibor va nutq faoliyatining o‘zaro ta’siri ochib beriladi.*

Kalit so‘zlar: *psixolingvistika, so‘z boyligi, boshlang‘ich sinf, nutqiy rivojlanish, til o‘rgatish metodikasi, psixik jarayonlar, idrok, xotira, tafakkur, o‘quvchi nutqi, interfaol metodlar, lingvistik kompetensiya*

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PSYCHOLINGUISTIC BASIS FOR DEVELOPING VOCABULARY IN PRIMARY SCHOOL CHILDREN

Annotation. *This article analyzes the psycholinguistic foundations of the process of vocabulary development in primary school students. The interaction of mental processes inherent in word learning and its use in active speech - perception, memory, thinking, attention, and speech activity - is revealed.*

Keywords: *psycholinguistics, vocabulary, primary school, speech development, language teaching methodology, mental processes, perception, memory, thinking, student speech, interactive methods, linguistic competence*

Boshlang‘ich ta’lim — bola nutqining shakllanishida eng muhim bosqich hisoblanadi. Aynan shu davrda bolalar atrofdagi hodisa va tushunchalarni so‘zlar orqali anglab, o‘z fikrini ifodalashni o‘rganadi. So‘z boyligi — o‘quvchining til kompetensiyasining asosi bo‘lib, uning fikrlash darajasi, dunyoqarashi va nutqiy faolligiga to‘g‘ridan-to‘g‘ri ta’sir ko‘rsatadi.

Tilni o‘rganish jarayoni nafaqat lingvistik, balki psixologik va kognitiv omillar bilan ham chambarchas bog‘liq. Shu bois, bugungi kunda psixolingvistika fanining maktabgacha va boshlang‘ich ta’limda qo‘llanilishi alohida dolzarb masalaga aylanmoqda.

Psixolingvistika — bu tilni o‘zlashtirish va qo‘llash jarayonini psixologik nuqtayi nazardan o‘rganadigan fan. U asosan **inson miyasi va tili** o‘rtasidagi munosabatni, til birliklarini qanday idrok qilish, eslab qolish va ifodalash mexanizmlarini o‘rganadi.

Boshlang‘ich sinf o‘quvchilarining so‘z boyligini oshirishda quyidagi **psixolingvistik omillar** muhim:

1. Idrok va diqqat. 7–10 yoshdagi bolalar konkret obrazlar orqali yaxshiroq fikrlaydilar. So‘zlarni eslab qolish uchun vizual va audial idrok kanallarini faollashtirish muhim. Diqqatni jamlash davomiyligi qisqa bo‘lganligi sababli so‘zlar qisqa kontekstda berilishi kerak.

2. Xotira. So‘zlarni xotirada mustahkamlash uchun takrorlash, bog‘lovchi assotsiatsiyalar, mantiqiy kontekstda qo‘llash muhim. Semantik (ma‘noli) xotira orqali so‘zlar yodlanadi, lekin kontekst bilan birga berilganda yaxshiroq saqlanadi.

3. Nutqni rejalashtirish. So‘z boyligi nafaqat passiv (eshitish va tushunish), balki aktiv (ifodalash, qo‘llash) ko‘nikmalar orqali rivojlanadi. Bola fikrini rejalashtirib aytishni o‘rgansa, yangi so‘zlarni kontekstda mustaqil ishlatishga o‘tadi.

4. Motivatsiya va hissiy fon. Qiziqarli, hissiy jihatdan ijobiy bo‘lgan o‘yinlar, she’rlar, ertaklar — psixolingvistik rivojlanishda katalizator rolini bajaradi. So‘z boyligi ko‘pincha emotsional muloqotlar jarayonida faol rivojlanadi.

Boshlang‘ich sinf o‘quvchilarida so‘z boyligi quyidagi bosqichlar orqali kengayadi:

Yosh oralig‘i	So‘z boyligi shakllanishi xususiyati
6–7 yosh	So‘zlarni takrorlab yod olish, rasm asosida so‘z aytish, sinonim-antonim o‘rganish.
7–8 yosh	Gap tuzish, kontekstda so‘z qo‘llash, mavzuli suhbatlarda ishtirok etish.
9–10 yosh	Matnli ifoda, hikoya tuzish, shaxsiy fikrni so‘z bilan ifodalash ko‘nikmalari.

So‘z boyligini rivojlantirishda quyidagi asosiy psixolingvistik yondashuvlar farqlanadi: **Kognitiv yondashuv b**ola ongida til birliklarini tartib bilan shakllantirish (kategoriya, sema)dan iborat. **Assotsiativ yondashuv s**o‘zlar o‘rtasidagi semantik bog‘liqliklar asosida yod olish hisoblanadi. **Muloqotga asoslangan yondashuv. Bu yondashuvda t**il muloqot vositasi sifatida qaraladi, so‘zlar kontekstda o‘zlashtiriladi.

O‘yinli yondashuvda didaktik o‘yinlar orqali so‘zlarni eslab qolish va amaliy qo‘llash ustida ish olib borish ko‘zda tutiladi. Bolalarda so‘z boyligi rivojlanishining psixolingvistik omillaridan biri bu, idrok orqali so‘zlarni qabul qilish hisoblanadi. Bunda ayniqsa, boshlang‘ich sinf o‘quvchilarining so‘z boyligini rivojlantirishda muhim psixolingvistik jihat hisoblanadi.

Idrok — til o‘rganishning boshlang‘ich bosqichi. Idrok – bu atrofdagi axborotni sezgi organlari orqali qabul qilish, tanib olish va uni ongli tarzda qayta ishlash jarayonidir. So‘zlarni o‘zlashtirishda o‘quvchi avval ularni eshitadi (auditiv idrok), ko‘radi (vizual idrok), sezadi yoki amalda qo‘llaydi (kinestetik idrok).

Boshlang‘ich yoshdagi bolalarda diqqatning barqarorligi past bo‘ladi. Fikr va tasavvurlar ko‘proq tasviriy-timsoliy shaklda bo‘ladi. Konkret, ko‘rinadigan narsalarni tezroq idrok qiladi. Abstract (mavhum) tushunchalarni tushunishi sekin

kechadi. Bu esa so‘zlarni o‘rgatishda amaliy-tasviriy yondashuvdan foydalanishni talab qiladi.

So‘zni idrok etishning rivojlanish bosqichlarini quyidagicha belgiladik:

Bosqich	Xususiyati
1. Eshitish orqali tanishish	So‘z tovush jihatidan idrok qilinadi
2. Ko‘rish orqali bog‘lanish	So‘z ko‘rinishi, yozuvi o‘rganiladi
3. Amaliy bog‘lash	So‘zning ma’nosi hayotiy misollar bilan tushuniladi
4. Faol ishlatish	So‘z nutqda mustaqil ishlatiladi

Harakatli (kinestetik) idrok orqali o‘zlashtirishda esa so‘zni aytish, yozish, rasm chizish, rolli o‘yinlarda ifodalash orqali bola uni tanib olishdan tashqari, **xotirasida faol kodlaydi**. Masalan, “qush” so‘zini aytib, uni jismonan ifodalash (qo‘l bilan parvoz qilish), rasm chizish — idrokni mustahkamlaydi.

Semantik tahlil va so‘zlar o‘rtasidagi bog‘liqlik. So‘zlar ma’nosini tushuntirganda bir-biri bilan semantik jihatdan bog‘liq bo‘lgan so‘zlar bilan birgalikda tushuntirish yo‘lidan foydalanilsa, bunday bog‘lanishlar bolaning semantik tarmog‘ini rivojlantiradi va kelajakda uyadosh so‘zlar tarmog‘ini o‘rganishga zamin hozirlanadi. Masalan, “daraxt – barg – meva – ildiz” so‘zlar guruhi bir-biriga mantiqan bog‘langan.

Assotsiatsiya va metafora orqali o‘zlashtirish. Bola yangi so‘zlarni avvalgi bilimlar bilan bog‘lab, **assotsiativ usul**da o‘zlashtiradi. Shu bois, o‘quvchi uchun notanish so‘zlar tanish voqealar bilan uyg‘unlashtirilgan kontekstda taqdim etilishi kerak. Bu esa, bolani hodisalar o‘rtasidagi mantiqiy bog‘liqlik, yaxlitlik tamoyili asosida hayotni tushunishiga yo‘naltiradi.

Muloqot faoliyatidagi rollar. Til faqat bilim emas, balki faoliyatdir. Bola so‘zlarni qanchalik ko‘p **muloqotga qo‘shib ishlatish** imkoniga ega bo‘lsa, so‘z boyligi shuncha tez rivojlanadi. Guruhli ishlar, suhbatlar, rolli o‘yinlar bu yerda muhim ahamiyat kasb etadi. Chunki ravon nutqning ham asosiy sharti bu, ko‘proq og‘zaki muloqot o‘rnatish hisoblanadi.

O‘quvchilar bilan so‘z ma’nosini tushuntirishda olib borish uchun quyidagi ish turlarini tavsiya etamiz:

1-sinf (6–7 yosh)da:

1. So‘zlarni yod olish vizual kontekstda amalga oshiriladi.
2. Rasm asosida so‘z aytish, oddiy sinonimlar bilan tanishtirish.
3. So‘z – gap – hikoya zanjiri orqali rivojlantirish.

2-sinf (7–8 yosh)da:

✓ Gaplar tuzish, yangi so‘zlar bilan tanishib, ular bilan **o‘xshash va zid ma’nodagi** juftlar tuzish.

✓ Ma’no kartalari va rasmli lug‘at ishlatish.

✓ O‘rgatilgan so‘zlar bilan matn tuzish, hikoya yozish.

3-4-sinf (8–10 yosh)da:

✓ Matnni tahlil qilish, so‘zlarning ma’no qatlamlarini ochish.

✓ Metafora, so‘z o‘yini, jonlantirish, so‘z yasash usullari bilan tanishtirish.

✓ Muayyan mavzuda erkin fikr bildirishga undash (masalan: “tabiat”, “ota-onam”, “maktab”).

Boshlang‘ich sinf o‘quvchisining **nutqiy rivojlanishi va so‘z ma’nosini tushunishi** murakkab, bosqichma-bosqich kechadigan jarayondir. Bu jarayonni chuqur tushunish uchun **psixolingvistik tamoyillar**ga tayanish zarur. Chunki bola so‘zlarni eshitish, ko‘rish, aytish va tushunish jarayonida aynan psixik jarayonlar orqali tilni o‘zlashtiradi. Shunday ekan, boshlang‘ich ta’limda o‘qituvchi tilni o‘rgatishda nafaqat leksik birlikni, balki **uning psixik anglanish yo‘llari**ni ham hisobga olgan holda darslar tashkil qilishi lozim.

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O‘QUVCHI-YOSHLARDA VATANPARVARLIK RUHINI SHAKLLANTIRISHNING PEDAGOGIK ASOSLARI

Annotatsiya: *Ushbu maqolada o‘quvchi-yoshlarda vatanparvarlik tuyg‘usini shakllantirishning pedagogik asoslari, uning zamonaviy ta’limdagi o‘rni, tarbiyaviy ahamiyati va shakllantirish haqida fikr yuritiladi. Bundan tashqari maqolada jadid ma’rifatchilarining yetuk vakillari ijodi orqali yosh avlodni vatanparvarlik ruhida tarbiyalashning pedagogik asoslari tahlil etiladi.*

Kalit so‘zlar: *vatanparvarlik, yoshlar tarbiyasi, pedagogik asoslar, integratsiya, milliy qadriyatlar, dars jarayoni, o‘quvchi shaxsiyati.*

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PEDAGOGICAL BASIS OF FORMING A SPIRIT OF PATRIOTISM IN YOUTH STUDENTS

Annotation: *This article analyzes the pedagogical foundations of fostering a sense of patriotism among students, its role in modern education, its educational importance, and methods of implementation. In addition, the article explores the pedagogical foundations of educating the younger generation in the spirit of patriotism through the works of prominent representatives of the Jadid enlightenment movement.*

Keywords: *patriotism, youth education, pedagogical foundations, integration, national values, lesson process, student personality.*

Bugungi globallashuv, madaniy-ma’naviy raqobat kuchayib borayotgan davrda mustaqil davlatning siyosiy barqarorligi, iqtisodiy salohiyati va ma’naviy yuksalishi bevosita uning fuqarolarining, ayniqsa, yosh avlodning ijtimoiy ongi, vatanparvarlik tuyg‘usi va fuqarolik pozitsiyasiga chambarchas bog‘liqdir. Shu nuqtai nazardan qaralganda, har bir taraqqiyparvar jamiyat uchun yoshlarni vatanparvarlik ruhida tarbiyalash dolzarb va strategik masala hisoblanadi. Vatanparvarlik – bu shunchaki tuyg‘u emas, balki milliy ong, yurtga muhabbat, tarixiy xotiraga hurmat va ma’naviy mas’uliyat bilan chambarchas bog‘liq ijtimoiy-psixologik holatdir.

Milliy tarbiya tizimining markazida vatanparvarlik g‘oyasi turadi. U o‘z ichiga ona tilini e’zozlash, milliy qadriyatlarni asrab-avaylash, o‘z yurtining tarixiy va madaniy merosiga hurmat bilan qarash, el-yurt istiqboli uchun javobgarlik his qilish kabi asosiy fazilatlarni mujassamlashtiradi. Tarixiy manbalar, ayniqsa, o‘zbek ma’rifatparvarlik harakati vakillari – jadidlarning qarashlari shundan dalolat beradiki, milliy uyg‘onish, ma’naviy o‘zlikni anglash, madaniy tiklanish jarayonlarida ta’lim-tarbiyaning o‘rni benihoya katta.

Xususan, Abdulla Avloniy singari yirik ma’rifatparvarlar “tarbiya – saodat asosidir” degan g‘oyani ilgari surgan holda, yosh avlodni ma’naviy yetuk, millatparvar, xalqparvar va vatanparvar shaxs sifatida tarbiyalashni milliy taraqqiyotning bosh omili sifatida belgilaganlar. Avloniy “Turkiy guliston yoxud axloq” va “Milliy tarbiya” asarlarida yoshlar ongida vatan tuyg‘usini shakllantirishni ta’lim-tarbiyaning ustuvor yo‘nalishi deb hisoblaydi. Unga ko‘ra, millatsiz tarbiya bo‘lmaganidek, tarbiyasiz millatning mustahkam poydevori bo‘lishi mumkin emas.

Zamonaviy pedagogik qarashlarda ham tarbiyaning milliy zamin bilan uyg‘unligiga alohida urg‘u berilmoqda. Vatanparvarlik ruhini shakllantirish, uni ta’lim jarayonida samarali qo‘llash o‘qituvchilarning yondashuvi, metodik mahorati, tarbiyaviy resurslardan foydalanish darajasi bilan chambarchas bog‘liq. Har bir o‘quvchi qalbida Vatanga muhabbat urug‘ini qadash, uni bilim, amaliy faoliyat va ijtimoiy mas’uliyat asosida rivojlantirish bugungi ta’lim tizimi oldida turgan muhim pedagogik vazifalardan biridir.

Harakati asosini Vatan va o‘z ona tiliga muhabbat, millat erkinligi masalalari tashkil etgan jadidchilik harakati XIX asrning oxiri va XX asr boshlarida Markaziy Osiyoda shakllangan va o‘zbek xalqining ma’rifiy uyg‘onishida beqiyos o‘rin tutgan ijtimoiy-siyosiy va madaniy hodisa hisoblanadi. Ushbu harakat vakillari o‘z asarlarida xalqni jaholat va qoloqlikdan chiqarish, zamonaviy bilimlar va milliy qadriyatlarga asoslangan ta’lim-tarbiya tizimini barpo etishga da’vat etganlar. Vatanparvarlik, milliy ong, o‘zlikni anglash kabi tushunchalar ularning asarlarida markaziy mavzulardan biri bo‘lib xizmat qilgan.

Millat oydinlaridan Mahmudxo‘ja Behbudiy: “Maktab – millatning najot yo‘lidir,”- deganida nechog‘lik haq edi. Behbudiy o‘z asarlarida maktabni milliy uyg‘onish vositasi sifatida talqin qilgan. Uning fikricha, Vatanni sevish – bu ilmli, ziyrak va jamiyatga foydali shaxs bo‘lish bilan bog‘liq. U shunday yozadi: “Millatni yo‘q qilmoq uchun avval uning maktabini yo‘q qilmoq kerak.” Bu fikr bugungi kunda ham o‘z dolzarbligini yo‘qotmagan. O‘quvchi-yoshlarda vatanparvarlik tuyg‘usini shakllantirish, ularni yurt ravnaqiga daxldor shaxs sifatida tarbiyalash, avvalo maktabdagi ta’lim-tarbiya tizimiga bog‘liq. Behbudiyning bir qator asarlarida bu g‘oyalar hayotiy obrazlar va didaktik ko‘rsatmalar orqali yoritilgan.

“Jadidlar otasi” deya nom olgan, maktab-maorif, tarbiya, vatanga muhabbat g‘oyalarini ilgari surgan Munavvarqori Abdurashidxonov tarbiyani “milliy mustaqillikning negizi” deya izohlaydi.

Munavvarqori Abdurashidxonov jadid pedagogikasining asoschilaridan bo‘lib, bolalarda milliy g‘urur va Vatanga muhabbat hissini uyg‘otishda tarbiyaviy

vositalarning ahamiyatini alohida ta’kidlagan. Uning fikricha: “Har bir o‘g‘il bola – elning suyanchi, har bir qiz bola – millatning kelajagi. Ularni sog‘lom fikr, toza axloq va Vatanga muhabbat bilan tarbiyalash har bir muallimning muqaddas burchidir.”

U o‘zining hikoya va maqolalarida maktab muhitida vatanparvarlik va axloqiy yetuklikni uyg‘un holda shakllantirish zarurligini ta’kidlaydi. Munavvarqori o‘qituvchining o‘rnini faqat bilim beruvchi emas, balki tarbiyachi, ruhshunos va namuna bo‘la oluvchi shaxs sifatida belgilaydi.

Ma’naviy uyg‘onish va o‘zlikni anglashga vatanparvarlik poydevori sifatida yondashgan Abdurauf Fitratning pedagogik va falsafiy qarashlari yoshlarda o‘zligini anglash, tarixiy xotirani tiklash, milliy g‘urur va vatanparvarlik hissini uyg‘otishga qaratilgan. Uning “O‘zbek yoshlariga”, “Milliy maktablar haqida”, “Munozara” kabi asarlari zamonaviy pedagogika uchun chuqur konseptual asos bo‘lib xizmat qiladi.

Fitrat yozadi: “Kim o‘z tarixini bilmasa, u boshqalarning tarixiga quldek xizmat qiladi.”

Bu fikr bugungi kunda yosh avlodni tarixiy xotira, milliy meros va Vatanning taqdiriga befarq bo‘lmaslikka chorlaydi. Fitrat milliy tarbiyani tafakkur tarbiyasi bilan birga olib borishni taklif etadi. U ta’lim jarayonida tanqidiy fikrlash, dunyoqarash kengligi va ijtimoiy faollikni vatanparvarlikning ajralmas qismi deb biladi.

Abdulla Avloniy saodatning asosi tarbiyada va vatanparvarlik – tarbiyaning yadro nuqtasi deya, o‘zining “Turkiy guliston yoxud axloq”, “Milliy tarbiya” kabi asarlarida vatanparvarlikni ma’naviy barkamollikning asosiy omili sifatida ko‘rsatgan. U shunday deydi: “Tarbiya biz uchun yo hayot, yo mamot, yo najot, yo halokat, yo saodat, yo falokat masalasidir.”

Avloniy uchun vatanparvarlik – bu avvalo axloqiy yetuklik, o‘z yurtini tanish, sevish va himoya qilishga tayyorlikdir. Uning pedagogik konsepsiyasida yosh avlod qalbiga Vatanga muhabbatni singdirish, ular ongida milliy mas’uliyat tuyg‘usini uyg‘otish ustuvor ahamiyatga ega. Bu g‘oya uning asarlarida nafaqat nazariy, balki didaktik misollar, she’rlar va ibratli hikoyatlar orqali ham yoritilgan.

Yosh avlodni vatanparvarlik ruhida tarbiyalash – har bir millatning ma’naviy kamoloti, tarixiy xotirasi va istiqboli bilan bevosita bog‘liq bo‘lgan muhim ijtimoiy-pedagogik jarayondir. O‘zbekistonning mustaqillik sari bosib o‘tgan yo‘li, davlatimiz tomonidan ta’lim-tarbiyaga berilayotgan e’tibor, ayniqsa, yurtparvar, milliy g‘ururga ega, ongli fuqaroni shakllantirishga qaratilgan islohotlar, bu boradagi ishlarga yangicha yondashuv zaruratini ko‘rsatmoqda.

Ayniqsa, jadid ma’rifatchilari – Mahmudxo‘ja Behbudiy, Munavvarqori Abdurashidxonov, Abdurauf Fitrat va Abdulla Avloniy asarlarida ilgari surilgan pedagogik qarashlar bugungi ta’lim tizimi uchun ham muhim nazariy asos bo‘lib xizmat qiladi. Ular yoshlarni ongli, ma’rifatli, milliy o‘zlikka sodiq, Vatanni sevuvchi, ma’naviy barkamol shaxs sifatida tarbiyalashning zarurligini ta’kidlaganlar. Jadid adabiyotidagi bu g‘oyalar bugungi kun sharoitida ham o‘z

ahamiyatini yo‘qotmagan, aksincha, yangicha shakllarda ta’lim tizimiga integratsiyalash ehtiyoji ortib bormoqda.

Xulosa o‘rnida aytish mumkinki, vatanparvarlik – bu faqat dars mavzusi emas, balki ta’lim-tarbiya jarayonining har bir bosqichida izchil ilgari surilishi lozim bo‘lgan, o‘quvchi shaxsiyati rivojiga ta’sir ko‘rsatuvchi strategik ma’naviy qadriyatlardan biridir. Uni shakllantirishda esa o‘zbek ma’naviyatining ildizlariga tayangan holda, zamonaviy pedagogik texnologiyalar bilan uyg‘un yondashuvni yo‘lga qo‘yish bugungi kunning dolzarb vazifasidir.

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BOSHLANG‘ICH SINFLARDA INTEGRATSIYALASHGAN DARSLARNI TAKOMILLASHTIRISHNING DIDAKTIK XUSUSIYATLARI

Annotatsiya. *Ushbu maqolada boshlang‘ich sinflarda integratsiyalashgan darslarni tashkil etish zaruriyati, ularning o‘quvchilar tafakkurini rivojlantirishdagi roli, amaliy yondashuvlar, dars turlarining tahlili, shuningdek, muammoli yondashuv asosida dars samaradorligini oshirish yo‘llari bayon etiladi. O‘qituvchilarning tajribasi umumlashtirilib, o‘quv fanlariaro aloqadorlikning dolzarbligi yoritiladi.*

Kalit so‘zlar: *integratsiyalashgan dars, fanlararo aloqadorlik, boshlang‘ich ta’lim, muammoli yondashuv, dars samaradorligi, ijodiy fikrlash.*

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DIDACTIC FEATURES OF IMPROVING INTEGRATED LESSONS IN PRIMARY GRADES

Annotation. *This article discusses the necessity of organizing integrated lessons in primary school, their role in the development of students' thinking, practical approaches to lesson planning, an analysis of lesson types, and ways to enhance lesson effectiveness through problem-based methods. The experiences of teachers are summarized, and the relevance of interdisciplinary connections in the educational process is highlighted.*

Keywords: *integrated lesson, interdisciplinary connection, primary education, problem-based approach, lesson effectiveness, creative thinking.*

Zamonaviy boshlang‘ich ta’lim jarayonida fanlararo integratsiyalashuv muhim o‘rin egallaydi. Turli fanlar o‘rtasidagi mantiqiy bog‘liqlikni hisobga olib darslarni uyg‘un tashkil qilish orqali bolalarning bilim olishi mazmunan boyitiladi, ularda tafakkur, muomala, amaliy va ijodiy ko‘nikmalar shakllanadi. Ayniqsa, kichik maktab yoshidagi bolalarda bilimlar tizimini shakllantirishda fanlararo integratsiyalashuv ta’limning barqarorligini ta’minlaydi.

Boshlang‘ich ta’lim fanlari – o‘qish savodxonligi, ona tili, matematika, atrof-muhit, tasviriy san’at, musiqa va texnologiya kabi fanlar o‘zaro mazmuniy yaqinlikka ega. Shu bois ularni integratsiyalash orqali quyidagi pedagogik afzalliklarga erishiladi:

- o‘quvchilarning bilim va ko‘nikmalarini yaxlit holda shakllantirish;
- mavzularni real hayot bilan bog‘lash;
- darsni yanada jonli, tushunarli va amaliy asosli qilish;
- darsda vaqtni samarali taqsimlash;
- o‘quvchilarning mustaqil fikrlashi va muammoli vaziyatda qaror qabul qilish qobiliyatini rivojlantirish.

Boshlang‘ich sinf fanlarini integratsiyalash quyidagi yo‘llar bilan amalga oshiriladi:

Integratsiya turi	**Tavsifi va misollar**
Mazmuniy integratsiya	Bir mavzuni turli fanlarda muvofiqlashtirib o‘rganish. Masalan, “Bahor” mavzusi – o‘qish darsida bahorga oid matn, atrof-muhit fanida tabiatdagi o‘zgarish, tasviriy san’atda bahor manzarasini chizish.
Didaktik integratsiya	Turli fanlarda o‘xshash metodik vositalardan foydalanish. Masalan, muammoli topshiriqlar, klasterlar, aqliy hujum.
Amaliy integratsiya	Bir fan mazmunidagi bilimni boshqasida qo‘llash. Masalan, matematikada o‘lchov birliklarini texnologiya fanidagi buyum tayyorlashda qo‘llash.

Fanlararo integratsiyalashgan darslarni samarali tashkil etish uchun o‘qituvchi:

1. Turli fanlar mazmunini mukammal o‘zlashtirgan bo‘lishi;
2. Bir mavzuni bir nechta fan orqali yoritish metodikasini bilishi;
3. Darsni ilg‘or pedagogik texnologiyalar asosida loyihalashi;
4. Har bir o‘quvchining yosh, psixologik va individual xususiyatlarini inobatga olgan holda faoliyat yuritishi lozim.

Boshlang‘ich sinf fanlarini integratsiyalash asosida o‘tiladigan darslar quyidagi didaktik talablarga javob berishi kerak:

- o‘rganilayotgan mavzu turli fanlardagi bilimlar bilan bog‘liq bo‘lishi;
- mavzuga oid ko‘rgazmalar, sxemalar, modellar, real hayotiy misollar bilan mustahkamlanishi;
- dars jarayoni o‘quvchilarning fikrlash faoliyatini rag‘batlantiruvchi, muammoli savollar va topshiriqlar asosida tashkil etilishi;
- bilimlar umumlashtirilishi, turli fanlarda o‘rganilgan tushunchalar o‘zaro taqqoslanishi;
- darsda har bir o‘quvchining qiziqishi va individual salohiyati inobatga olinishi.

Fanlararo integratsiya nafaqat bilim olish, balki bolalarning ijodiy faoliyatini rivojlantirish uchun ham qulay imkoniyat yaratadi. Masalan:

- “Sen sevgan kitob” aksiyasi – o‘qish + nutq rivoji + tasviriy san’at;

- “Ovchilar” o‘yini – tabiatshunoslik + tanqidiy fikrlash + jismoniy faollik;
- “Shirin taom tayyorlaymiz” – matematika + texnologiya + mehnat tarbiyasi;
- “Bahor manzarasi” – san’at + tabiatshunoslik + ona tili orqali ta’rif berish.

Shuningdek, bolalarning badiiy tafakkurini rivojlantirish uchun kichik sahna ko‘rinishlari, she’r yozish, raqs yoki ertak sahnalashtirish kabi mashg‘ulotlar ham fanlararo bog‘liqlikda samarali qo‘llanadi.

Darslarda quyidagi ishlar ta’limiy muhitni uyg‘unlashtiradi:

- mavzular asosida devoriy suratlar, maketlar, xaritalar tayyorlash;
- ertak qahramonlari orqali bolalarni mavzular bo‘ylab sayohatga olib chiqish (masalan, Dyumovochka, Karlson);
- ensiklopedik bilimlarni bolalar uchun qiziqarli shaklda integratsiyalashgan mashg‘ulotlarga kiritish;
- bolalarning idrokiga ta’sir qiluvchi emotsional vositalar (hid, tovush, tasvir, teginish)dan foydalanish.

Bugungi kunda boshlang‘ich ta’limda fanlarni integratsiyalash — ta’lim mazmunini yangilash va yangicha yondashuvlar asosida takomillashtirishning zaruriy yo‘nalishlaridan biri sifatida qaralmoqda. Integratsiyalashgan darslar nafaqat bir necha o‘quv fanlarining mazmuniy jihatdan uyg‘unlashuvini ta’minlaydi, balki bolalarning bilimlarni idrok etish, ularni turli hayotiy vaziyatlarda qo‘llay bilish, o‘zaro bog‘liqlikni anglab yetish kabi tafakkur jarayonlarini faollashtiradi.

Fanlararo aloqadorlik orqali tashkil etilgan darslar o‘quvchilarning shaxsiy tajribasiga asoslangan holda, ularning ilgari olgan bilimlarini yangilar bilan bog‘lash, o‘zlashtirish, mustahkamlash va amaliyotda qo‘llash imkonini beradi. Ayniqsa, kichik maktab yoshidagi o‘quvchilar uchun bu yondashuv alohida ahamiyat kasb etadi. Sababi, ularning tafakkuri konkret-obrazli bo‘lib, bilimlarni yaxlit, kontekstda qabul qilishga moyil. Integratsiyalashgan darslar esa aynan mana shu psixologik xususiyatlarga mos keladi.

Mazkur maqolada tahlil qilinganidek, integratsiyalashgan yondashuv asosida dars o‘tish — bu oddiygina fanlararo bog‘liqlikdan foydalanish emas, balki pedagogik maqsadga muvofiq holda rejalashtirilgan, chuqur o‘ylangan, har tomonlama tahlil etilgan va metodik jihatdan pishiq tayyorgarlikni talab qiladigan jarayondir. U o‘qituvchidan yuqori darajadagi didaktik savodxonlikni, innovatsion fikrlashni, metodik moslashuvchanlikni, har bir o‘quvchining qiziqishlari va qobiliyatlarini chuqur tahlil qilishni taqozo etadi.

Shu nuqtai nazardan qaralganda, fanlarni integratsiyalash asosida tashkil etilgan darslar quyidagi ijobiy natijalarga erishish imkonini beradi:

- ✓ o‘quvchi uchun dars mazmuni tushunarli, hayotiy va muhim bo‘lib boradi;
- ✓ bolalarning o‘zaro bog‘liq fikrlash, muammoni hal etish, umumlashtirish va sintez qilish ko‘nikmalari shakllanadi;
- ✓ bilimlarning fragmentar emas, balki tizimli va yaxlit holatda o‘zlashtirilishiga erishiladi;

✓ o‘quvchilarni mustaqil izlanishga, so‘rovchanlikka, o‘z ustida ishlashga undaydi;

✓ ijodiy va emotsional jihatdan faol o‘quv muhitini shakllantiradi;

✓ o‘quvchida o‘zini shaxs sifatida his qilish, o‘zining fikri va g‘oyalariga ishonch hosil qilish, jamiyatda o‘z o‘rnini topish kabi hayotiy ko‘nikmalar rivojlanadi.

Bundan tashqari, integratsiyalashgan ta’lim vositasida kichik maktab yoshidagi bolalarda emotsional sezgirlik, estetik did, nozik didlilik, insoniylik, badiiy tasavvur, milliy qadriyatlar va umumiy madaniyatni anglash, shuningdek, ijtimoiy-axloqiy mezonlarni shakllantirishga zamin yaratiladi. Bu esa, o‘z navbatida, ta’limning faqat bilim beruvchi emas, balki tarbiyaviy va ijtimoiy shakllantiruvchi funksiyalarini samarali amalga oshirish imkonini beradi.

Shunday qilib, boshlang‘ich sinf fanlarini integratsiyalash asosida takomillashtirish, darsni yangi sifat bosqichiga olib chiqadi. Bu metodik yondashuv orqali ta’lim tizimi nafaqat natijaga, balki jarayonga, ya’ni o‘quvchining faol ishtirokiga, tafakkurini rivojlantirishga, shaxsiy salohiyatini ochishga xizmat qiladigan amaliy vositaga aylanadi. Bu esa o‘z navbatida, zamonaviy jamiyat ehtiyojlariga mos, raqobatbardosh, mustaqil fikrlovchi va faol shaxsni shakllantirish yo‘lidagi muhim qadamlardan biri sanaladi.

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ECONOMIC DEVELOPMENT TRENDS IN UZBEKISTAN

Annotation: *in the article at the current stage of development of our country, in the context of further deepening socio-economic reforms, the following have been identified as priority tasks for the further development of small and private entrepreneurship: training employees of small enterprises in effective labor methods, transition to rational methods of using labor potential, introduction of advanced labor methods, reduction of costs due to introduction of effective labor methods.*

Keywords: *small business, entrepreneurship, labor relations, labor organization, labor standards, employment.*

If we talk about the measures that are currently being taken to develop the economy of Uzbekistan, then, first of all, state support in financing entrepreneurial activity is very important. To support the activities of entrepreneurs, it is important to provide loans at favorable interest rates, attract more investments in this area, further expand tax benefits, and ensure convenience in the process of paperwork. In particular, deep structural changes in the economy, income growth, increased employment, and the creation of new jobs by increasing the efficiency of entrepreneurial activity should be implemented in a short time, as well as Various forms of employment of the population are developing, which is positively reflected in the number of small enterprises, micro-firms and other types of enterprises and organizations operating in our country.

One of the most important aspects of the development of family entrepreneurship is that it increases the chances of employment for unemployed family members. Therefore, in recent years, large-scale work has been carried out to create decent living conditions for the population by supporting the socio-economic development of the country, active entrepreneurship, in particular, the development of family entrepreneurship.

As a priority area for increasing employment, it is necessary to develop the following labor relations:

- full satisfaction of the needs of all segments of the working population for socially useful work;
- effective coordination of human labor according to the nature and content of labor;
- compatibility of social and production factors in the labor process, considered as conditions of employment in small business and entrepreneurship;
- high growth in labor productivity and efficiency indicators;

- as a result of the distribution of labor resources, the possibility of achieving success in satisfying the material, spiritual and social needs of the population.

The methodological approach to protecting the labor rights of workers and strengthening labor protection, maintaining the working capacity and health of citizens in the process of work, ensuring their safety, supporting balanced labor relations between employers and employees plays an important role. A number of legislative acts adopted in our country specifically highlight measures and tasks that affect the methodology of ensuring labor relations. This is reflected, first of all, in the Labor Code of the Republic of Uzbekistan. Article 16 states the following:

In accordance with the Constitution of the Republic of Uzbekistan, everyone has the right to work, to free choice of work, to fair and honest working conditions, to protection from unemployment in the manner prescribed by law. Each worker:

- receive remuneration for their work in an amount not lower than that established by law for the first category of the Unified Tariff Scale of Remuneration;
- Rest provided by establishing standardized working hours, reducing the working day for a number of professions and jobs, providing weekly days off, holidays, and paid annual vacations;
- professional training, retraining and advanced training;
- compensation for damage caused to health or property in connection with the performance of professional duties;
- join trade unions and other organizations representing the interests of workers and work collectives;
- for social security in old age, in case of loss of ability to work, loss of a breadwinner and in other cases provided by law;
- to protect their labor rights, including through legal protection and obtaining qualified legal assistance;
- has the right to protect his interests in collective labor disputes.

Based on the study of research conducted in this area, we believe that the following factors influence the development of labor relations:

- in the course of modern development of the labor marketimprovement of the regulatory framework for labor rights and freedoms of citizens, labor protection;
- improving the professional level of employees of regional labor agencies through the introduction of modern methods of the digital economy;
- implementation of state control and supervision over compliance with the requirements of legislation in the field of protection of labor rights of citizens, as well as labor protection and ensuring safe working conditions by organizations, regardless of the organizational and legal forms of business;
- protection and continuous monitoring of compliance with the rights of subjects of labor relations, as provided for by legislation on labor, employment of the population and labor protection, as well as public control over the quality of certification of workplaces for working conditions;

- improving the system of providing advisory and methodological assistance to employees and employers, including small businesses and entrepreneurs, on issues of application and compliance with labor and occupational safety legislation.

In the development of small business and entrepreneurshipFeatures of the implementation of motivation mechanisms, the formation of skills according to G.K. AbdurakhmanovaAccording to their research, "...the system of labor incentives in a transitional economy should consist of the following components:

- firstly, it is a system of material, monetary incentives for work. Its essence lies not only in the payment of a certain amount of wages for work, but also in ensuring a positive perception by the employee of the amount of labor expended and the amount of monetary income received for it;

- secondly, a system of material incentives of a social nature (non-monetary). This system includes the creation of decent working conditions for workers, ensuring motivation for work through the transition to a creative, meaningful work process, encouraging them by allocating free time, creating a favorable atmosphere in the team;

- and finally, thirdly, incentives aimed at motivating a person not only as a mechanism performing production functions, but also as an individual. The three methods of labor motivation listed above should form a complete system of labor motivation applicable to both an individual and a team.

The effectiveness of small business and entrepreneurship traditionally represents a set of adequate perceptions, decision-making, actions and skills that are formed at certain stages of its existence and change as the business grows, develops and changes, moving from one qualitative state to another.

Skills, Knowledge, and Experience Technical skills are essential if the business idea is to produce a product or provide a service. Business management skills are the skills needed to run a business wisely. Having marketing skills may be the most important of these, but other areas of business management are vital to success.

Entrepreneurship is an important factor in economic development, increasing employment and incomes of the population. In order to comprehensively support representatives of this sphere, more than fifty decrees and resolutions have been adopted in recent years. In particular, the procedures for state registration of entrepreneurial activity, obtaining various permits and many other services have been simplified. To create conveniences in this regard, the Agency for State Services and its territorial centers have been created, and the position of business ombudsman has been introduced.

Also, the Resolutions of the President of the Republic of Uzbekistan dated June 27, 2018 No. PP-3777 "On the implementation of the program "Every family is an entrepreneur", dated October 24, 2019 No. PP-4498 "On additional measures to improve the procedure for lending to projects implemented within the framework of state programs for the development of family entrepreneurship", dated August 30, 2022 No. PP-364 "On measures to implement the tasks set in the "Open Dialogue" of the President of the Republic of Uzbekistan with entrepreneurs in

2022" provide for the development of small businesses and the elimination of problems and obstacles arising in this activity.

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GIDROELEKTROSTANSIYA POTENSIALI

Annotatsiya: *Bugungi kunda suv toshqini elektr stansiyalarining quvvati bir necha 100 Mvtgacha bo‘lishi mumkin. To‘lqin energiyasidan foydalanish biroz murakkabroq va qimmatroq elektr energiyasini olish imkonini beradi. Muqobil energiya olishning asosiy usullari energiya manbalari sifatida mustaqil bino va inshootlardan foydalanish imkoniyati nuqtai nazaridan ko'rib chiqiladi.*

Kalit so'zlar: *Muqobil energiya, shamol generatori, gelioenergetika, quyosh kollektori, atrof-muhitni muhofaza qilish.*

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HYDROELECTRIC POTENTIAL

Abstract: *Today, the capacity of flood power plants can be up to several 100 MW. The use of wave energy makes it possible to obtain slightly more complex and more expensive electricity. The main methods of obtaining alternative energy are considered in terms of the possibility of using independent buildings and structures as energy sources.*

Keywords: *Alternative energy, wind turbine, solar energy, solar collector, environmental protection.*

Bugungi kunda shu tarzda ishlab chiqarilgan elektr energiyasining nisbatan kichik miqdoriga qaramay, ushbu turdagi qayta tiklanadigan energiya manbalarining umumiy energiya potensiali deyarli cheksizdir.

Mini va mikroGES daryolar, kichik daryolar, sharsharalardagi suv massalarining kinetik energiyasidan foydalangan holda o‘z miqdorda, bir necha o‘nlab kVtgacha elektr energiyasini ishlab chiqarishga imkon beradi. Balandlik farqi 1,3 m dan va suv sarfi 1 m3/s mikroGES girdob prinsipiga ko‘ra 10 kVt / soatgacha elektr energiyasini olish imkonini beradi. Ular suv massalarining kinetik energiyasidan maksimal darajada foydalanishga imkon beradigan maxsus shakldagi pervanelli generatorlardan iborat [7].

To‘lqin energiyasidan foydalanuvchi gidroyelektr stansiyalar bugungi kunda eng ko‘p tarqalgan, to‘lqin balandligi 13 metrgacha bo‘lishi mumkin bo‘lgan katta to‘lqin mavjud bo‘lgan joylarda qurilmoqda. Suv toshqini energiyasidan to‘g‘onlar o‘rnatish orqali foydalanish mumkin, bu ekologik jihatdan juda xavfsiz emas, shuningdek, to‘g‘onlarni ishlatmasdan dengiz tubidagi suv oqimlari bo‘lgan joylarda past tezlikli turbinalarni o‘rnatish orqali foydalanish mumkin. Bunday

turbinalar dengiz florasi va faunasiga deyarli zarar etkazmaydi. Bugungi kunda suv toshqini elektr stansiyalarining quvvati bir necha 100 Mvtgacha bo‘lishi mumkin.

To‘lqin energiyasidan foydalanish biroz murakkabroq va qimmatroq elektr energiyasini olish imkonini beradi. To‘lqinli gidroyelektrostansiya-bu dengiz tubiga biriktirilgan stasionar platforma bo‘lib, unga diametri bir necha metrgacha bo‘lgan katta suzgichlar qo‘llarga (shpallarga) o‘rnatiladi, ular dengiz to‘lqinlarida yuqoriga va pastga siljiydi, gidravlik silindrlar orqali elektr energiyasini ishlab chiqaruvchi generatorlarni boshqaradi.

Kichik gidroyenergetikaning asosiy afzalligi shundaki, u ob-havo sharoitlariga bog‘liq emas va yilning istalgan vaqtida elektroyenergetika ishlab chiqarishni barqaror ravishda ta’minlaydi [8].

Ushbu turdagi muqobil energiyaning kamchiliklari sayyoramizning aylanish tezligiga ta’sir qiladi, hisob-kitoblarga ko‘ra, bu ta’sir sayyoramizning aylanish davri sekinlashishi bilan taxminan 10-9 ni tashkil qiladi, bu to‘lqin oqimlari ta’siridan 5 daraja past.

Bioenergetika;

Bugungi kunda chorvachilik chiqindilarini qayta ishlash orqali elektr energiyasini ishlab chiqarish texnologiyalari allaqachon keng qo‘llanilmoqda, Volga mintaqasida, shu jumladan 40 kVt dan 5 mvtgacha bo‘lgan qurilmalar mavjud. 1 kubometrning energiya samaradorligi biogaz (55-70 % - Ch4, 45-30 % - CO2) 6 kVt / soatgacha bo‘lishi mumkin va undan foydalanganda ichki yonish dvigatelining elektr energiyasini olish uchun energiyaning 45% elektr energiyasi va 55% issiqlik energiyasi shaklida chiqariladi. Biogazning hosildorligi 20 (qoramol go‘ngi) dan 600 gacha (pekmez) kamdan-kam hollarda 1 tonna substrat uchun 1300 kubometrni tashkil qiladi [9].

Yana bir yo‘nalish – biogazni CO2 dan tozalash orqali donni qayta ishlash chiqindilaridan tayyor bioyoqilg‘ini, masalan, biometanni, mahalliy gazning analogini olish.

Ushbu texnologiyani rivojlantirishning navbatdagi bosqichi maishiy chiqindilarni qayta ishlash bilan bog‘liq bo‘lib, unda ikkita juda muhim vazifa hal qilinadi, elektr energiyasini olish va maishiy va sanoat chiqindilarini xavfsiz yo‘q qilish, ya’ni ekologik vaziyatni yaxshilash [10].

Qoida tariqasida, yuqoridagi qurilmalar 40-100 kVt / s dan ortiq quvvatga ega va ishlab chiqarish asosida yaratilgan bo‘lib, ular faoliyati natijasida ko‘p miqdordagi energiya tejaydigan biomassa, ya’ni chorvachilik, oziq-ovqat ishlab chiqarish va boshqalardan ajralib chiqadi.

Muqobil energiya olishning deyarli barcha usullarining umumiy muammolari quyidagilardan iborat:

- misol tariqasida, bu tartibga solinmagan energiya manbalari, ya’ni. elektr energiyasini ishlab chiqarish yorug‘lik nurlanishining intensivligiga, ob-havo sharoitlariga, mavsumga, atrof-muhit haroratiga, shamol tezligi va yo‘nalishiga va boshqalarga bog‘liq bo‘lib, bu ularning umumiy elektr tarmoqlariga integratsiyasini sezilarli darajada murakkablashtiradi va ishlab chiqarilgan muqobil energiya narxini oshiradi;

- qabul qilingan elektr energiyasini 220 V, 50 Gts sanoat standartiga etkazish zarurati, buning uchun qimmat invertorlar (olingan energiyaning elektr parametrlarini o‘zgartirgichlar) ishlatiladi, ularning narxi muqobil energiya olish uchun barcha uskunalar narxining 50 foizigacha yetishi mumkin, shu bilan birga ularning ishlashi paytida elektr energiyasining katta qismi issiqlik hosil bo‘lishiga sarflanadi;

-avtonom tizimlarda o‘zgaruvchan energiya ishlab chiqarilmasa, elektr energiyasini to‘plash zarurati tufayli akkumulyator batareyalaridan foydalanish zarurati (ularning narxi butun kompleksning umumiy qiymatining 25 foizigacha yetishi mumkin).

Yuqoridagilardan xulosa qilishimiz mumkinki, muqobil energiya olishning universal usuli yo‘q. Ularning afzalliklari va kamchiliklarini birlashtirib, bir necha usullardan foydalanish kerak. Kam miqdordagi elektr energiyasini ishlab chiqarish uchun bunday muvaffaqiyatli kombinatsiyaga misol sifatida inverter va batareyalar bilan birgalikda ishlaydigan past quvvatli elektr energiyasi va shamol generatoridan iborat kompleksni keltirish mumkin. Bugungi kunda bunday kompleks ancha yuqori narxga ega, ammo kelajakda qayta tiklanmaydigan energiya manbalari narxining oshishi bilan u an’anaviy energiya manbalariga haqiqiy alternativi bo‘lishi mumkin.

Barqaror bo‘lmagan bino va inshootlarni elektr energiyasi bilan ta’minlash uchun muqobil energiya manbalari sifatida quyosh energiyasi, shamol energetikasi va kichik gidroyenergetika eng mos keladi, muqobil energiyaning qolgan turlari katta miqdordagi elektr energiyasini ishlab chiqarishda eng samarali hisoblanadi.

Shamol generatorining ishlashining asosiy sharti 3 m/s dan yuqori tezlikda harakatlanadigan havo massalarining mavjudligi, shuning uchun, qoida tariqasida, ularning joylashgan joyi qirg‘oq zonalari, tepaliklar, tokchalar (qirg‘oq zonasida joylashgan).

Zamonaviy shamol generatorlari balandligi 100 m dan oshishi mumkin va pichoqlarning diametri bir necha o‘n metrga yetadi. Nominal ish rejimlarida chiqish quvvati (shamol tezligi 10 m/s) 10 Mvtgacha yetadi.

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INNOVATSION TADBIRKORLIK VA UNING ZAMONAVIY IQTISODIYOTDAGI O'RNI

Annatatsiya: *Mustaqillik yillarida O'zbekistonda bozor iqtisodiyotining asosi bo'lgan xususiy mulk ustuvorligini mustahkamlaydigan barqaror qonunchilik bazasi yaratilganini qayd etish zarur. O'rta mulkdorlar sinfini shakllantirish, mamlakat iqtisodiyotini barqaror yuksaltirish, yangi ish o'rinlari yaratish va aholi daromadini oshirishning muhim omili bo'lgan kichik biznes va xususiy tadbirkorlikni jadal rivojlantirish bo'yicha qulay ishbilarmonlik muhiti hamda ishonchli huquqiy kafolatlar yaratildi.Natijada so'nggi o'n yilda yalpi ichki mahsulot tarkibida kichik biznes ulushi 31,1 foizdan 52,5 foizga o'sdi, ushbu sohada bandlik darajasi iqtisodiyot tarmoqlarida ish bilan band aholi umumiy sonining 49,7 foizidan 74,5 foizigacha oshdi. Aholi daromadlarining 47 foizdan ziyodi tadbirkorlik faoliyatidan tushgan daromadlar hissasiga to'g'ri keladi.*

Kalit so'zlar: *bozor iqtisodiyoti,Kichik biznes, tadbirkorlik,rivojlanish*

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INNOVATIVE ENTREPRENEURSHIP AND ITS PLACE IN THE MODERN ECONOMY

Abstract: *It is necessary to note that during the years of independence, a stable legislative framework was created in Uzbekistan, which strengthens the primacy of private property, which is the basis of a market economy. A favorable business environment and reliable legal guarantees were created for the rapid development of small business and private entrepreneurship, which are an important factor in the formation of a middle-class owner class, sustainable growth of the country's economy, creation of new jobs and increasing the income of the population. As a result, over the past ten years, the share of small business in the structure of gross domestic product has increased from 31.1 percent to 52.5 percent, the employment rate in this sector has increased from 49.7 percent to 74.5 percent of the total number of people employed in economic sectors. More than 47 percent of the population's income comes from income from entrepreneurial activity.*

Keywords: *market economy, small business, entrepreneurship, development*

"Kichik biznes va xususiy tadbirkorlik yili" Davlat dasturiga muvofiq, joriy yilda tadbirkorlik faoliyatini keng rivojlantirish uchun yanada qulay biznes muhitni yaratish bo'yicha kompleks chora-tadbirlar qabul qilindi.

Tadbirkorlik subyektlarini davlat ro‘yxatidan o‘tkazish va ularni muhandislik-kommunikatsiya tarmoqlariga ulash tartibi sezilarli darajada soddalashtirildi hamda bu jarayon yanada ochiqlik kasb etdi. Ro‘yxatga olish uchun davlat boji stavkasi ikki barobarga qisqartirildi. Ishchilarning yillik o‘rtacha soni 100 kishigacha ko‘paytirilgan kichik korxonalar shug‘ullanishi mumkin bo‘lgan faoliyat turlari ro‘yxati sezilarli darajada kengaytirildi. Kichik biznes subyektlarini davlat xaridlari jarayoniga keng miqyosda jalb qilish mexanizmi ishlab chiqildi va joriy etildi.

Davlat va nazorat idoralarining korxonalar moliyaviy-xo‘jalik faoliyatiga aralashuvini keskin kamaytirish hamda tadbirkorlik subyektlarining iqtisodiy erkinligi va huquqlarini sezilarli ravishda kengaytirish bo‘yicha choralar qabul qilindi. Yangi tashkil qilingan kichik korxonalar va mikrofirmalarni rejali soliq tekshiruvlaridan ozod etish muddati ikki yildan uch yilga uzaytirildi. Soliq va boshqa majburiy to‘lovlarni o‘z vaqtida to‘layotgan, shuningdek, ishlab chiqarishning barqaror o‘sish sur’atlari va rentabelligini ta’minlayotgan kichik tadbirkorlik subyektlarida uch yil davomida soliq tekshiruvlarini o‘tkazish taqiqlandi.

Tijorat banklarining kapitallashuv darajasi oshmoqda, kichik biznes subyektlarini, ayniqsa, ularning yuqori texnologik uskunalar xarid qilishi uchun imtiyozli kreditlash mexanizmi takomillashtirildi.

Shu bilan birga, kichik biznes va xususiy tadbirkorlikning jadal rivojlanishiga to‘sqinlik qilayotgan, tadbirkorlik faoliyati erkinligini cheklayotgan bir qator muammolar hal etilmay qolmoqda.

Tadbirkorlik subyektlarining davlat, soliq va nazorat idoralari, tijorat banklari bilan o‘zaro munosabatlarini aniq belgilab beradigan ma’muriy reglament to‘liq ishlab chiqilmagan. Ochiqligi ta’minlanmagan ko‘plab ruxsat berish tartiblari hamon saqlanib qolmoqda. Nazorat idoralarining tadbirkorlik subyektlari faoliyatiga noqonuniy aralashish holatlari uchramoqda. Kichik biznes mahsulotlarini hududiy va jahon bozorlariga olib chiqish bo‘yicha amaliy mexanizm yaratilmagan.

Ishbilarmonlik muhitini yanada tubdan yaxshilash, bozor islohotlarini liberallashtirish va chuqurlashtirish yo‘lidan jadal harakat qilish, tadbirkorlikka ko‘proq erkinlik berish, kichik biznes va xususiy tadbirkorlikni rivojlantirish yo‘lidagi to‘siq va g‘ovlarni bartaraf etish, kichik biznes va xususiy tadbirkorlikning mamlakat iqtisodiyotidagi roli va ulushini oshirish, eksport salohiyatini rivojlantirish, aholi bandligi va daromadlarini ta’minlash maqsadida:

1. Quyidagilar Vazirlar Mahkamasi, vazirliklar, idoralar, xo‘jalik birlashmalari, tijorat banklari, Qoraqalpog‘iston Respublikasi Vazirlar Kengashi, viloyat, shahar va tumanlar hokimliklarining muhim vazifalari deb hisoblansin:

kichik biznes va xususiy tadbirkorlikni rivojlantirish yo‘lidagi ortiqcha byurokratik to‘siq va g‘ovlarga barham berish, davlat boshqaruvi funksiyalarini qisqartirish va tadbirkorlikka ko‘proq erkinlik berish bo‘yicha aniq chora-tadbirlarni amalga oshirish, davlat boshqaruvi organlari tomonidan amalga

oshirilayotgan turli ruxsat berish me’yorlari hamda cheklash tartiblarini keskin qisqartirish;

Bugungi globallashuv va raqamli transformatsiya davrida iqtisodiy taraqqiyotning asosiy harakatlantiruvchi kuchlaridan biri bu – innovatsion tadbirkorlikdir. An’anaviy biznes modellari o‘rnini tezlik bilan yangi texnologiyalarga, ilg‘or bilimlarga va yaratuvchanlikka asoslangan yondashuvlar egallamoqda. Innovatsion tadbirkorlik nafaqat mahsulot yoki xizmatlarni takomillashtirish, balki butun iqtisodiy tizimni yangilash va barqaror rivojlantirishga xizmat qilmoqda.

Innovatsion tadbirkorlik nima?

Innovatsion tadbirkorlik – bu mavjud bozor talablariga javob beradigan, shu bilan birga ilgari mavjud bo‘lmagan g‘oya, texnologiya yoki yondashuv asosida yangi mahsulot yoki xizmatlar yaratish orqali iqtisodiy foyda olish faoliyatidir. Bunday tadbirkorlik asosan yuqori texnologiyalar, IT, biotexnologiya, ekologik toza energiya va boshqa zamonaviy yo‘nalishlarda tez rivojlanadi.

Innovatsiyaning iqtisodiyotga ta’siri

Innovatsion tadbirkorlik zamonaviy iqtisodiyotda quyidagi jihatlar bilan muhim o‘rin egallaydi:

1. **Yangi ish o‘rinlari yaratiladi.** Startaplar va innovatsion kompaniyalar ko‘pincha yosh mutaxassislar, dasturchilar va muhandislar uchun keng imkoniyatlar yaratadi.
2. **Mahsulot va xizmatlar sifati oshadi.** Raqobatbardoshlikni ta’minlash maqsadida kompaniyalar yangilik kiritishga intiladi.
3. **Milliy iqtisodiyot diversifikatsiyalanadi.** Innovatsiyalar yangi sanoat tarmoqlari paydo bo‘lishiga olib keladi, bu esa iqtisodiy xavfsizlikni kuchaytiradi.
4. **Eksport salohiyati oshadi.** Innovatsion mahsulotlar xorijiy bozorlar uchun jozibali bo‘lib, mamlakatga valyuta tushumini ta’minlaydi.

O‘zbekistonda innovatsion tadbirkorlikni rivojlantirish istiqbollari

O‘zbekiston hukumati so‘nggi yillarda innovatsion rivojlanishga katta e’tibor qaratmoqda. Raqamli texnologiyalarni joriy etish, startap ekotizimini shakllantirish, texnoparklar, inkubatorlar va akseleratorlar faoliyatini kengaytirish orqali innovatsion tadbirkorlik uchun qulay muhit yaratilmoqda.

Yoshlar va talabalar orasida innovatsion fikrlashni rag‘batlantirish maqsadida turli grantlar, tanlovlar va treninglar o‘tkazilmoqda. Biroq, hali ham bu yo‘nalishda yechimini kutayotgan muammolar mavjud: moliyaviy manbalarning cheklanganligi, tajribali mentorlar yetishmasligi, bozor infratuzilmasining to‘liq shakllanmagani va boshqalar.

Innovatsion iqtisodiyotning umumiy asoslari, fanning predmeti, maqsad va vazifalari Insoniyat paydo bo’lgandan buyon ular o’rtasidagi ijtimoiyiqtisodiy ayirboshlash, shuningdek, ishlab chiqarish va xizmat ko’rsatish munosabatlari to’xtovsiz rivojlanish jarayonini boshidan kechirib kelmoqda

Foydalanilgan adabiyotlar:

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ҚОРАҚОЛПОҒИСТОН ШАРОИТИДА НАВДОР ТУТ КЎЧАТЛАРИНИ ЕТИШТИРИШ ТАРТИБИ

Аннотация. *Интенсив тутзорлар барпо этишда 0,9 х 0,9 м схемани қўллаш юқори самара бериши асослаб берилган. Ушбу технология асосида экилган тутзорлардан фойдаланилса ва қуртлар парваришланган тақдирда 1 қути уруғдан 80,2 кг пилла ҳосили олишга эришилади. Тажрибаларимизда қишга чидамли, Сурх-тут, Ўзбекистон, Кинриу, Пионер навлари Урганч тут кўчатзорида она тутзорда ўсаётган ва Ҳазорасп туманининг Муҳамон номли фермер хўжалигининг она тутзорида келтирилган навларда ҳалқалаш ўтказилди.*

Калит сузлар *нав, қаламчалар, усул, тутзор,агротехник тадбир, тупрок структураси*

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PROCEDURE FOR GROWING VARIETAL TUT SEEDLINGS IN THE CONDITIONS OF KARAKALPAKSTAN

Abstract. *The high efficiency of applying the 0.9 x 0.9 m scheme in the creation of intensive mulberry plantations has been substantiated. When using mulberry plantations planted using this technology and when growing caterpillars, it is possible to obtain 80.2 kg of cocoons from 1 box of seeds. In our experiments, we conducted ringing of winter-hardy mulberry varieties Surkh-tut, Uzbekistan, Kinriu, Pioneer, grown in the maternal mulberry plantations of the Urgench mulberry nursery and brought to the maternal mulberry plantations of the Mukhamon farm in the Khazarasp district.*

Keywords: *variety, cutting, method, mulberry orchard, agrotechnical measure, soil structure*

Today, along with the creation of new varieties and hybrids suitable for the specific natural and climatic conditions of our republic, the development of technologies that combine agrotechnical measures, new methods, and recommendations aimed at improving the yield, nutritional value, and quality of grown products is of great importance. As with other fruit trees, shaping peach tree branches and timely implementation of agrotechnical measures are important factors in the condition and productivity of fruit trees. Proper shaping of the peach tree, the correct selection of fruit-bearing shoots, plays an important role in obtaining a high yield. Because it has been emphasized that good growth of fruit-bearing mother shoots plays an important role in the formation of flower and fruit tubers in it[6].

The high effectiveness of using the 0.9 x 0.9 m scheme in establishing intensive mulberry plantations is substantiated by [5,8]. With the use of mulberry plantations planted according to this technology and the care of caterpillars, a yield of 80.2 kg of cocoons per 1 box of seeds is achieved. Based on scientific research, it has been proven that 88.3 kg of cocoons can be obtained when sown according to the 2.5 m scheme, and 90 kg when sown according to the 4.0 x 0.5 scheme.

One of the most important factors in vegetative propagation of plants is the rooting of the vegetative organ, that is, the cuttings.

Experiments conducted by researchers for this purpose show that when plants grown from lignified cuttings are planted in a permanent location, the formation of their root system during the vegetation period, i.e., the first order of roots, is somewhat greater and they reach a depth of 75 cm in the soil, but they emphasize that in seedlings grown from green cuttings, the predominance of branching, the number of actively moving small roots, and the total volume of the root system was 36-44%. This, in turn, indicates that the seedling quickly absorbs nutrients[2,7]. In this case, the cuttings were prepared in the second ten days of February, buried in 50-60 cm trenches before planting, and in the horizontal method, the cuttings were placed in furrows with a depth of 7-8 cm and buried with soil. In the second inclined method, cuttings 15-20 cm long were buried with soil, leaving one bud on the soil

surface. It was found that the rooting of the experimental cuttings was higher compared to the cuttings planted by the inclined method [1,3].

Experimental work was planned in the work program for conducting experiments and selection work on new regionalized mulberry varieties in the Khojeyli "Agro Pilla" LLC and the Sartbay Pirniyazov farm of the Khojeyli district of the Republic of Karakalpakstan.

1. In the second year (2022-2025), ringed cuttings were obtained from the SANIISH-5, Japanese variety Kinriu, Uzbekistan, Pioneer, Winter-Resistant varieties, Pobeda x Pioneer hybrid combinations, and as a control, ringed seedless Tajik variety cuttings were obtained.

2. In the experiments, selection varieties developed by scientists of the Scientific Research Institute of Sericulture, recommended for this region, and regionalized were used: In our experiments, winter-hardy varieties Surkh-tut, Uzbekistan, Kinriu, Pioneer were hatched on varieties growing in the mother mulberry plantation of the Urgench mulberry nursery and brought from the mother mulberry plantation of the Mukhamon farm of the Khazarasp district.

Table 1
Biological classification and selection of the following varieties
Definition data.

Complex hybrid SANIISH-5	(*Morus.alba.L*) species is characterized by strong shoot formation, short spacing between buds, medium-sized leaves, small-edged female variety. According to the data of the author A.S. Didichenko, root formation is considered to have good properties.
Kinriu	The Japanese variety belongs to the genus M.Kagautae.koidz, has large flat-leaved shoots of medium size, medium-sized buds, and spurs. The variety is female, fruit production is weak. Buds are large, triangular in shape. The susceptibility to bacteriosis is considered a defect of the variety.
Pioner	(*M.alba.L*) It produces large-leaved, strong shoots, with annual shoots reaching up to 2.5-3.0 m. High yield.
Winter-resistant	*(M alba Linn)* Intended for Tashkent region and northern regions. The main value of the variety is its high winter hardiness and 1.5 times earlier yield compared to other regionalized varieties. One of the characteristic features is the presence of gray branches, reaching up to 3 m. The leaves are medium-sized and entire. The female is considered a variety.
Surkh mulberry	*(M. alba Linn)* It is zoned in the northern part of Turkmenistan. The main value of the variety is its winter hardiness and good leaf yield. The leaf blade is medium, entire, or slightly notched. The branches are medium-sized, light-colored. Female variety.
Uzbekistan	*(M.multicaulis Perr)* It is regionalized for the Fergana region and has recently been widely used in the Khorezm region. The leaves are thick, fleshy and soft, and are the most nutritious food for silkworms. Annual shoots are very strong, reaching a length of 2.7-3.0 m. According to the author S.S. Zinkina, the Uzbekistan variety takes root well during cuttings. Rooting in cuttings is noted in the works of M.I.Grebinskaya.
seedless Tajikistan	*(Morus alba L)* It is a clone selected by M.I.Grebinskaya from the local mulberry variety Bedona. The branches are moderately strong. The intervals between the joints are not the same; short joints and long joints alternate. The female variety produces few fruits, is very sweet, lacks seeds, is very cold-resistant, and is characterized by a high leaf yield.

During the research, a detailed description of the varieties (leaves, branches, buds, and roots) was prepared. Data were collected and analyzed in the 3-4 years of the study.

Thus, in the conditions of Karakalpakstan, the advantages of planting mulberry saplings in autumn are that in autumn, the labor force coincides with the time when it is free from other agricultural work, there is no need to water the saplings planted in autumn, the roots are well rooted in the soil, and due to the moisture accumulated in the

soil, they develop quickly with the warming of the air in early spring. Naturally, their germination percentage was also higher compared to seedlings planted in spring.

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JAMOAT XAVFSIZLIGI TUSHUNCHASI TAHLILI (EKSPERT BAHOLARI ASOSIDA)

Annotatsiya. *Mazkur maqolada konseptual-strategik hujjatlarda hamda xorijiy va mahalliy olimlarning jamoat xavfsizligi tushunchasiga bergan ta’riflari, ularning qiyosiy tahlili bayon etilgan.*

Kalit so‘zlar: *jamoat xavfsizligi, jamoat xavfsizligini ta’minlash, shaxs, erkinlik, jamiyat va davlat manfaatlari, xavfsizlik, huquq, konsepsiya, tasnif, ta’rif.*

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ANALYSIS OF THE CONCEPT OF PUBLIC SECURITY (BASED ON EXPERT ASSESSMENTS)

Abstract. *The article presents definitions of the concept of public security in conceptual and strategic documents, as well as the opinions of foreign and domestic scientists, in addition, a comparative analysis of the concept of public security is made.*

Keywords: *public safety, ensuring public safety, personality, freedom, interests of society and the state, security, law, concept, classification, definition.*

Mamlakatimizda amalga oshirilayotgan keng ko‘lamli islohotlar doirasida aholining tinch va osoyishta hayotini ta’minlash hamda jamiyatimizda qonunga itoatkorlik va jamoat xavfsizligini ta’minlash bo‘yicha uzoq muddatli kontseptual-strategik hujjatlarni ishlab chiqishga alohida e’tibor qaratilmoqda.

Jumladan, jamoat xavfsizligini ta’minlash yo‘nalishidagi ishlarni tashkil etishning mutlaqo yangi mexanizm va tartiblari joriy etilib, davlat organlarining jamoatchilik tuzilmalari bilan o‘zaro maqsadli hamkorligi yo‘lga qo‘yildi.

Jamoat xavfsizligini ilm-fanning mustaqil sohasi sifatida belgilagan holda kompleks tadqiqotlarni rivojlantirish, jamoat xavfsizligiga tahdidlar tizimini ishlab chiqish, jamoat xavfsizligiga tahdidlarni baholash mezoni va indikatorlarini belgilash bilan bog‘liq muammolarning ilmiy yechimini topish maqsadida xorij olimlarining bu sohaga bo‘lgan qarashlari va yondashuvlari o‘rganildi.

Tahlillar shuni ko‘rsatadiki bugungi kunda jamoat xavfsizligi tushunchasi keng qamrovli bo‘lib, butun dunyo bo‘ylab izlanishlar, o‘rganishlar, olimlarning fikr mulohazalarini tadqiq etishlar natijasida ushbu fikrga kelindi.

Quyida bir qator xorijiy va mahalliy olimlarning jamoat xavfsizligi tushunchasiga bergan ta’riflarining xilma-xilligi, jamoat xavfsizligini keng va tor ma’noda tushunish bilan bog‘liq fikrlari tadqiq etildi.

Xususan olimlarning jamoat xavfsizligi tushunchasiga bergan ta’riflari hamda fikr mulohazalari shartli ravishda keng va tor ma’noni anglatuvchi guruhlarga bo‘lindi.

Jumladan, keng ma’noda o‘zbek huquqshunosi, yuridik fanlar doktori, professor M.X. Rustambayevning “Jamoat xavfsizligini ta’minlash fuqarolarning hayoti va sog‘lig‘i, sha’ni va qadr-qimmatini, huquqlari, erkinliklari va qonuniy manfaatlarini, tadbirkorlarning manfaatlarini himoya qilish va boshqa shu kabi muhim masalalar bo’yicha turli chora-tadbirlarni amalga oshirishda ifodalanadi” deb aytib o‘tgan fikrlarini ko‘rsatish mumkin.[1].

Shuningdek, bir qator olimlar tomonidan jamoat xavfsizligi tushunchasini keng ma’noda holat, tizim yoki jarayon deb ta’riflagan bo‘lsa, ayrimlar buni tor doirada metodik asos, munosabat, element, chora-tadbirlar deb fikr bildirganlar.

Xususan, olim S.V. Nesterovning tadqiqotlarida, jamoat xavfsizligi deganda, jamiyatning g‘ayrihuquqiy tavsifdagi tahdidlardan himoyalanganlik holati tushunilishini isbotlagan [2].

N.A. Bosxamdjiyevaning tadqiqotlarida jamoat xavfsizligiga milliy xavfsizlikning ajralmas qismi, ijtimoiy guruhlar va odamlar muloqoti, inson va fuqaroning konstitutsiyaviy huquq va erkinliklari, jamiyatning boshqa qonuniy manfaatlarini tashkil etishning asosini tashkil etuvchi moddiy va ma’naviy qadriyatlarning g’ayriqonuniy xatti-harakatlar, texnogen va tabiiy xususiyatga ega bo‘lgan zararli hodisalar, ushbu huquqlar va qonuniy manfaatlarga tahdid soluvchi boshqa omillar va shart-sharoitlardan himoyalanganlik holati sifatida qarash taklif etilgan [3].

I.Yu. Makarichevning ta’kidlashicha, jamoat xavfsizligi tushunchasi shaxs, jamiyat va davlatning hayot faoliyati, davlat va munitsipal hokimiyat organlari, jamoat tashkilotlari (birlashmalari) va fuqarolarning xavfsiz faoliyat yuritishi, shuningdek, ularning huquqlari, erkinliklari va qonuniy manfaatlarini huquq normalari bilan himoyalanganlik holatini ifodalaydi [4].

A.A. Varguzovaning fikriga ko‘ra, jamoat xavfsizligi – jamiyatning o‘z hayotiy muhim manfaatlarini to‘sqinliksiz amalga oshirishini ta’minlovchi himoyalanganlik holati, shuningdek, shaxs, jamiyat va davlat hayotiy faoliyati jarayonida shakllanadigan ijtimoiy munosabatlar holati hisoblanadi[5].

M.I. Agabalayevning qayd etishicha, jamoat xavfsizligi – bu jamiyat va davlatning jamoat xavfsizligini ta’minlash sohasidagi faoliyatini tashkil etish, davlat va jamiyat institutlarining me’yoriy ishlashi, inson va fuqaroning huquqlari, erkinliklari hamda qonuniy manfaatlarini ro‘yobga chiqarishni tartibga solish jarayonida yuzaga keladigan ijtimoiy munosabatlarning himoyalanganlik holatini ifodalaydi [6].

D.G‘. Xalmuxamedovning fikriga ko‘ra, “Jamoat xavfsizligi nafaqat shaxs, jamiyatning yoki davlat manfaatlarining muayyan darajada ta’minlanganligi balki o‘sha shaxs yoki butun bir jamiyatning barqaror rivojlanishiga xavf tug‘diruvchi

omillardan qayd darajada (masalan, huquqiy yoki ijtimoiy) himoyalanganlik holatini ham ifodalaydigan fenomendir”[7].

L.P. Volkovaning fikriga ko’ra, jamoat xavfsizligi – ijtimoiy munosabatlarning tahdidlardan himoyalanganligidir [8].

P.V. Minenkoning qayd etishicha, jamoat xavfsizligining jinoiy-huquqiy tushunchasi davlat tomonidan qo‘riqlanadigan, jamoat institutlarining faoliyat ko‘rsatishini ta’minlaydigan va jamiyatning normal ijtimoiy-iqtisodiy rivojlanishining zaruriy sharti bo‘lgan obyektlarning zarur yoki yetarli darajada himoyalanganligi bilan bog‘liq, deb ta’riflaydi [9].

Ya.N. Radyushinning ta’kidlashicha, jamoat xavfsizligi davlat va shaxsiy xavfsizlik bilan birgalikda milliy xavfsizlikning mazmunini tashkil etadi, shu bilan birga uning xavfsizlik obyekti belgisiga ko‘ra sezilarli darajada farqlanadigan turlari hisoblanadi. Bunda davlat xavfsizligining obyekti davlat, jamoat xavfsizligining obyekti jamiyat va shaxs, shaxsiy xavfsizlikning obyekti esa tashkilotlar va shaxsdir. Obyektlarni aniqlashtirish ushbu tarzda bo‘lishining sababi shundaki, davlat va jamiyat, davlat va shaxs xavfsizligi kabi masalalarni hal qilishda ziddiyatlar yuzaga kelishi mumkin bo‘lsa-da, jamiyat xavfsizligini ta’minlash shaxsni himoya qilmasdan, uning manfaatlari va ehtiyojlarini hisobga olmasdan amalga oshirib bo‘lmaydi. Jamoat xavfsizligini ta’minlash maqsadlari, vazifalari va tamoyillarini to‘g‘ri tushunish uchun zarur bo‘lgan aynan shu shart, uning obyektlari qatoriga jamiyat bilan bir qatorda shaxsning ham kiritilishini ta’kidlaydi [10].

B.P. Kondrashovning fikriga ko‘ra, jamoat xavfsizligi – ijtimoiy xavfsizlikning bir turi sifatida, shaxsning xavfsizligini, jamoat osoyishtaligini, fuqarolarning mehnat qilishi va dam olishi uchun qulay shart-sharoitlarni, davlat organlari, jamoat birlashmalari, korxonalar, muassasalar va tashkilotlarning jinoiy va boshqa g‘ayriqonuniy qilmishlardan kelib chiqadigan tahdiddan, yuqori xavfli manbalardan, erkin fuqarolik muomalasidan chiqarilgan predmetlar va moddalardan foydalanish tartibini buzishdan, shuningdek ijtimoiy, tabiiy, texnogen xususiyatga ega bo‘lgan salbiy hodisalardan va boshqa alohida holatlardan normal faoliyat ko‘rsatishini ta’minlash maqsadida huquqiy normalar bilan tartibga solingan ijtimoiy munosabatlar tizimi hisoblanadi[11].

G.V. Ishukning fikriga ko‘ra, “jamoat xavfsizligi deganda, davlat, jamiyat va shaxsning ijtimoiy muhim manfaatlari himoyalanganligi holati tushunilishi lozim. Jamoat tartibi jamoat xavfsizligini ta’minlashga qaratilgan jarayondir” [12].

K.A. Haydarov va M.A. Saminjonovlar fikriga ko‘ra, “Jamoat xavfsizligi tushunchasining zamirida, mamlakat xavfsizligini ichki xavf va tahdidlardan himoyalash sohasida qabul qilingan qonunchilik asnosida aniq muassasa, tashkilot, jamoat birlashmalari va fuqarolar faoliyati xavfsizligini ta’minlash maqsadi asosida muvofiqlashtirishga qaratilgan mexanizmni tushunish lozim”[13].

Shu o‘rinda, olim R.R. Rashidovning ta’kidlashicha: “Fanda “jamoat xavfsizligi” kategoriyasi tor va keng ma’noda ko‘rib chiqiladi. Keng ma’noda, “jamoat xavfsizligi” jamiyatning himoyalanganligi, tor ma’noda esa – jamoat joylarida xavfsizlikning ta’minlanganligi sifatida tushuniladi” [14].

Ye.A. Drojjinning tadqiqotlarida jamoat xavfsizligi jamoat xavfsizligini ta’minlashga qaratilgan ijtimoiy munosabatlar ekanligi, uning himoya obyekti – jamiyat (jamiyat xavfsizligi) hisoblanishi asoslab o‘tgan [15].

A.M. Voronovning ta’kidlashicha, xavfsizlik tushunchasi xavfsizlikning umummilliy nazariyasi tarkibidagi asosiy tushunchaviy kategoriya sifatida ta’riflanib, jamoat, axborot va boshqa turdagi xavfsizlikni ta’minlash muammolarini o‘rganishning metodologik asosi bo‘lib xizmat qiladi.

R.A. Romanovning fikriga ko‘ra, jamoat xavfsizligi barcha fuqarolarga, istisnosiz, tug‘ilishdan to umrining oxirigacha tegishli bo‘ladi. Jamoat xavfsizligi ham huquq normalari, ham boshqa ijtimoiy va texnik normalar bilan tartibga solinadi.

D.A. Korotchenkovning fikriga ko‘ra, jamoat tartibi va jamoat xavfsizligi milliy xavfsizlik tizimining eng muhim elementlari hisoblanadi.

F.K. Xo‘jamberdiev va I.Yo. Qilichevlarning ta’kidlashicha, “Jamoat tartibi va xavfsizligini muhofaza qilish deganda odamlarning hayoti va sog‘lig‘ini saqlash, ularning insoniy qadr-qimmatlarini, fuqarolarning huquqlari, erkinliklari va qonuniy manfaatlarini himoya qilish, korxonalar, muassasalar va tashkilotlarning manfaatlarini himoya qilish, odamlarning mehnat qilishi va hordiq chiqarishi, davlat organlari, jamoat birlashmalari va mehnat jamoalarining normal ishlashiga yaxshi madad beradigan hamda xotirjamlik muhitini yaratish bo‘yicha turli davlat organlari va jamoat birlashmalari tomonidan tizimli chora-tadbirlar amalga oshirish tushuniladi”.

A.Yu. Tashmuxammatov fikriga ko‘ra, “Jamoat tartibi va jamoat xavfsizligi ijtimoiy munosabatlarning har xil turi bo‘lib, ular o‘rtasida chambarchas aloqadorlik mavjud: ushbu guruh munosabatlarning har biri boshqasining mavjudlik shartidir” deb, ta’riflaydi.

Xulosa o‘rnida aytish mumkinki xorij olimlari va mahalliy olimlar fikr mulohazalari va qarashlari turli bo‘lishiga qaramay, ularning mazmun mohiyatida o‘xshashliklar kuzatiladi va bu masalalarni batafsil o‘rganilishi jamoat xavfsizligi konsepsiyasining takomillashiga hamda jamoat xavfsizligi tizimi konseptual asoslarining rivojlanishida muhim omil bo‘lib xizmat qiladi.

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DARAJALI ILDIZ CHIQARISH USULLARI

Annotatsiya. *Ushbu maqolada biz kalkulyator yoli sun’iy intellektsiz biror sonning kub ildizini topishni ko’rib chiqamiz. Nyuton-Rafson usuli murakkablik va aniqlik darajalariga mo‘ljallangan bo‘lib, kub ildizlarni topishda samarali yondashuvlarni taklif etadi.*

Kalit so‘zlar. *Kub ildiz chiqarish, Nyuton-Rafson usuli va kalkulatorsiz oson hisoblash.*

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METHODS OF EXTRACTING ROOTS (RADICALS)

Abstract. *This paper explores the process of finding the cube root of a number without using a calculator or artificial intelligence. The Newton–Raphson method offers an efficient approach for calculating cube roots, adaptable to different levels of complexity and precision.*

Keywords: *cube root extraction, Newton–Raphson method, manual computation without a calculator.*

Bugungi kunga kelib, murakkab amalli misollarni ishlash, ildiz chiqarish, formulalarning amaliy tadbiqlari, umumiyroq qilib aytganda har qanday masala va misollarni yechimini topish muammo emas. Zamonaviy – innovatsion texnologiyalar va dasturlar, ayniqsa, O‘zbekiston talaba-yoshlari o‘rtasida eng ko‘p foydalanilayotgan telefon ilovalari ichida Photomath yoki kundan kunga rivojlanib borayotgan sun’iy intellekt turlari talabalarni dangasa qilib qo‘yayotgani sir emas. Lekin, bugungi davrga qadar hisoblash usullari va yo‘llari hali ham o‘z mohiyatini yo‘qotmagan. Matematika fani rivojlanishi davomida kvadrat ildizlarni topish ko‘plab masalalarni hal etishda muhim vosita bo‘lib kelgan. Turli davrlarda matematiklar kvadrat ildizlarni aniqlash va hisoblash uchun turli usullarni ishlab chiqdilar.

[1] maqolada Nyuton – Rafsonning quyidagi hisoblash metodlari o'rganilib, quyidagi misol ko'rib chiqilgan.

$$x_{n+1} = \frac{1}{2}\left(x_n + \frac{N}{x_n}\right)$$

Misol: $\sqrt{2600}$ ni hisoblash:

Taxminiy ildiz: $x_0 = 50$

Formula bo'yicha: $x_1 = \frac{1}{2}(50 + \frac{2600}{50}) = \frac{1}{2}(50+52) = 51$

Keyingi takrorlash: $x_2 = \frac{1}{2}(51 + \frac{2600}{51}) \approx 51.00$

Bu usulni yana bir-ikki marta takrorlab, aniqroq natijaga erishish mumkin.

Ushbu maqolada esa kub ildiz chiqarishning *Nyuton-Rafson Usuli (Newton's Method)*ni ko'rib chiqamiz. Bu usul tezkor va aniqroq hisoblash imkonini beradi. Formulasi:

$$x_{n+1} = \frac{1}{3}\left(2x_n + \frac{N}{x_n^2}\right)$$

Bu yerda:

- A - kub ildizini topmoqchi bo'lgan son
- x_n - n - bosqichdagi taxmin
- x_{n+1} - keyingi bosqichdagi yangi taxmin

Misol: $\sqrt[3]{50}$ ni hisoblash:

Taxminiy ildiz: $x_0 = 4$

Formula bo'yicha:

$$x_1 = \frac{1}{3}\left(2 \cdot 4 + \frac{50}{4^2}\right) \approx 3{,}708$$

Keyingi takrorlash:

$$x_2 = \frac{1}{3}\left(2 \cdot 3{,}708 + \frac{50}{3{,}708^2}\right) \approx 3{,}684$$

Hisoblab borilsa, bu qiymat asta – sekin 3,684 atrofida barqarorlashashadi. Bu taxminan to'g'ri qiymat:

$$\sqrt[3]{50} \approx 3{,}684$$

Xulosa qilib shuni aytish mumkinki, yuqoridagidek hisoblash metodlari talaba yoshlarning fanga nisbatan qiziqishini va intellektual salohiyatini oshirishga yordam beradi. Amaliy mashg'ulot darslarida shunaqangi usullar haqida ma'lumot berib borish ham talabalarning fanga bo'lgan qiziqishini uyg'otishi shubxasiz.

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QASHQADARYO HAVZASINING GIDROLOGIK POTENSIALI VA RESURSLARDAN SAMARALI FOYDALANISH YO'LLARI

Annotatsiya. *Maqolada bugungi kunda dolzarb masalalardan biri bo'lgan, Qashqadaryo havzasida suv resurslarni shakllanishi bayon etilgan. Qashqadaryo daryosi irmoqlari ularning zahiralari to'yinish manbalarining mavjudligi xo`jalikdagi ahamiyati o`rganilgan. Bundan tashqari Qashqadaryo viloyatining suv resurslari shakllanishi, gidrologik tizimi, daryolar va ularning irmoqlari, shuningdek, sun'iy suv omborlari va yer osti suvlarining ahamiyati tizimli tahlil etilgan.*

Tayanch so'zlar: *suv resurlari, suv ta`minoti, gidrologik omil, to`yinish manbalari, yillik oqim, landshaft, gidrologik tarmoq, muzliklar, yer osti suvlari, suv taqsimoti, geoaxborot tizimi (GAT), raqamli xaritalash, suvdan samarali foydalanish.*

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HYDROLOGICAL POTENTIAL OF THE QASHQADARYO BASIN AND WAYS OF EFFICIENT RESOURCE UTILIZATION

Annotation. *The article discusses one of the pressing issues of today, the formation of water resources in the Kashkadarya basin. The tributaries of the Kashkadarya River and their significance in terms of the sources of replenishment of their reserves in agriculture have been studied. In addition, the formation of water resources in the Kashkadarya region, its hydrological system, rivers and their tributaries, as well as the importance of artificial reservoirs and groundwater have been systematically analysed.*

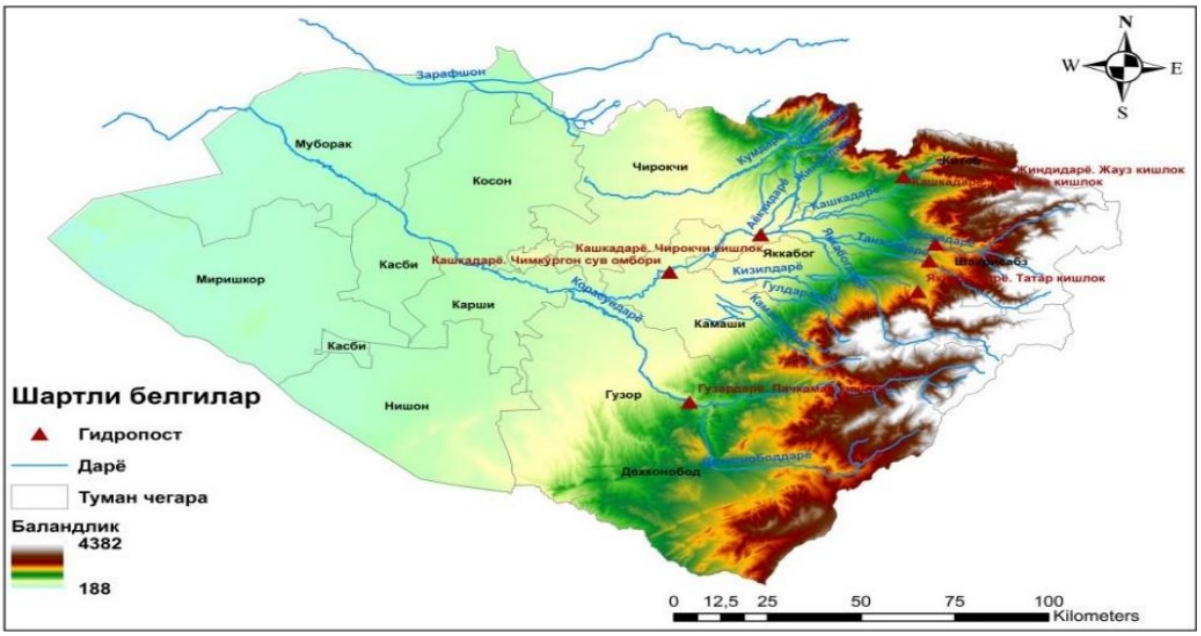
Key words: *water resources, water supply, hydrological factor, sources of saturation, annual runoff, landscape, hydrological network, glaciers, groundwater, water distribution, geographic information system (Gat), digital mapping, efficient use of water.*

Kirish. Suv resurslari har qanday hududning ijtimoiy-iqtisodiy taraqqiyoti va ekologik barqarorligining asosi hisoblanadi. Ayniqsa, iqlimi keskin kontinental va yog'ingarchilik kam bo'lgan hududlarda suv manbalarining shakllanish xususiyatlarini chuqur o'rganish dolzarb ahamiyat kasb etadi. Qashqadaryo viloyati

- O‘zbekistonning janubiy qismida joylashgan bo‘lib, uning tabiiy geografik holati, tog‘ va adir zonasidagi relyefi, iqlimiy sharoiti viloyatdagi suv resurslarining shakllanishida muhim omil sifatida maydonga chiqadi. Viloyat hududidan oqib o‘tuvchi Qashqadaryo daryosi va uning irmoqlari — Oqsuv, Yakkabog‘daryo, G‘uzordaryo kabi daryolar mahalliy suv resurslarining asosiy manbai hisoblanadi. Shuningdek, sun’iy suv omborlari — Hisorak, Chimqo‘rg‘on va To‘palang kabi suv inshootlari ham sug‘orish va ichimlik suvi bilan ta’minlashda alohida o‘rin tutadi. Ayni vaqtda suvdan samarali foydalanish, tejash, avtomatlashtirilgan boshqaruv tizimlarini joriy qilish orqali resurslarni boshqarish muammolari tobora muhimlashmoqda. Mazkur maqolada Qashqadaryo viloyatida suv resurslarining tabiiy shakllanish manbalari, gidrologik tizimi, suv omborlari va ulardan foydalanish mexanizmlari tizimli tahlil etiladi. Shu bilan birga, suv resurslarini tejashga qaratilgan chora-tadbirlar, mavjud muammolar va istiqboldagi yo‘nalishlar ilmiy-nazariy jihatdan yoritiladi.

Qashqadaryo viloyati qishloq xo’jaligi mahsulotlarini yetishtirish uchun qulay issiqlik sharoitlariga ega bo‘lsada, bu hudud uchun yilning katta qismida namning o‘ta tanqisligi xosdir. Iqlimning bunday xususiyati viloyatimizda boshqa quruq iqlimli hududlardagi kabi suniy sug‘orish tufayli hosil yetishtirishni belgilaydi. Bundan tashqari viloyatimizda neft-gaz, tog‘-kon, qurilish materallari ishlab chiqarish, kimyo sanoati tarmoqlarining rivojlanishi, kommunal xo‘jalikda suvga bo‘lgan ehtiyojni ortib borishi mahalliy hamda qo‘shni havzalardan olinayotgan suv resurslardan o‘ta tejamkorlik bilan foydalanishni hamda barcha suv manbalarini muhofaza qilishni taqqoza etadi.

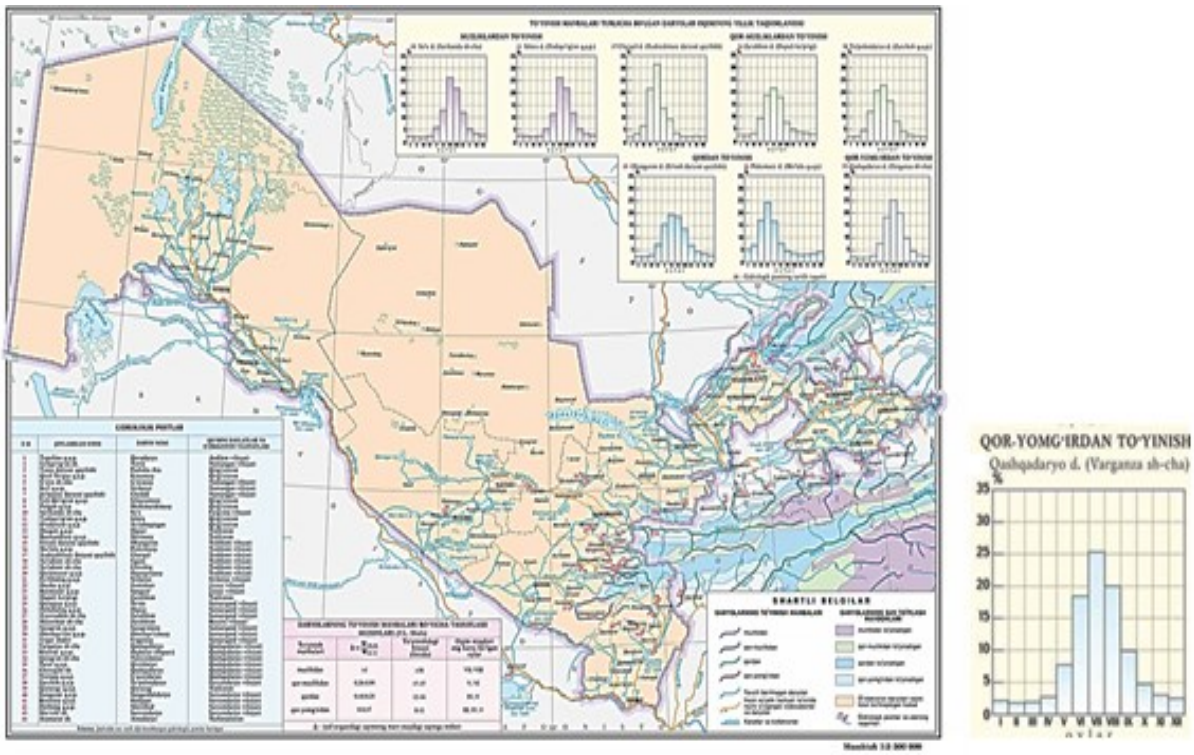
Asosiy qism. Suv - Qashqadaryo viloyati aholisi turmush sharoitlarini ta’minlaydigan va sotsial va muhitga ta’sir ko‘rsatadigan, iqtisodiy, barqaror sotsial rivojlanishini ta’minlaydigan muhim tabiiy resursdir. Qashqadaryo havzasining (suv yig‘iladigan maydoni 8780 km^2, havzasining maydoni 12 000 km^2) barcha daryolari uning tog‘li qismida jilg‘alar ko‘rinishida boshlanadi va bu jilg‘alar hamda soylar qo‘shilib, katta-kichik daryolarni, ular esa o‘z navbatida yaxshi shakllangan Qashqadaryo gidrografik to‘rini yuzaga keltiradi Qashqadaryo vohasida sug‘orma dehqonchilik jadal sur’atlarda rivojlangan, shu sababli Qashqadaryo va uning irmoqlarining suvlari butunlay sug‘orishga sarflanadi. Qashqadaryo havzasida 120 daryo va soylar mavjud. Ulardan 149 ta daryoning uzunligi 10 km dan ortiq, 33 tasining uzunligi – 20 km va undan uzunroq. Kuzatishlar O‘zgidromet xodimlari tomonidan daryoda joylashgan 11 ta gidrologik postlarda olib boriladi. [12]. (1-rasm).



1-rasm. Qashqadaryo havzasining gidrografik kartasi

Ammo, ularning asosiy qismi tog`li va tog` oldi hududlari bo`ylab oqadi. Havzaning eng uzun daryosi Qashqadaryo (332 km) bo‘lib, unga chap tomondan Jinnidaryo, Oqsuv, Tanxozdaryo, Yakkabog‘daryo, G‘uzordaryo kabi irmoqlar qo‘shiladi. Daryoning o‘rta va quyi oqimlarida o‘ng sohildan qo‘shiladigan yirikroq irmoqlar yo‘q. Qashqadaryoning o‘ng sohilida 18 ta yirik soy va ko‘plab mayda soylar oqadi [2]. Ular birlashib 4 ta – Sho‘robsoy, Makridsoy, Oyoqchisoy va Qalqamasoy havzalarini hosil qiladi. V.L. Shuls va L.I. Shalatova Qashqadaryo havzasi daryolarini to‘yinish xususiyatlariga qor – muzlik (Yakkabog‘daryo, Tanxozdaryo va Oqsuv daryosi), qor (Qashqadaryo) va qor – yomg‘ir (Jinnidaryo, Qorasuv, Turnabuloq, Langardaryo, G‘uzordaryo va uning irmoqlari – Katta O‘radaryo va Kichik O‘radaryo) suvi bilan to‘yinidigan daryolar guruhga ajratadishgan. Quyidagi rasmda O’zbekiston daryolarining to’yinish manbalari kartasi berilgan bo’lib, ushbu kartadan Qashqadaryo daryosi havzasining to’yinishi qor-yomg’irdan ekanini ko’rishimiz mumkin. (2-rasm)

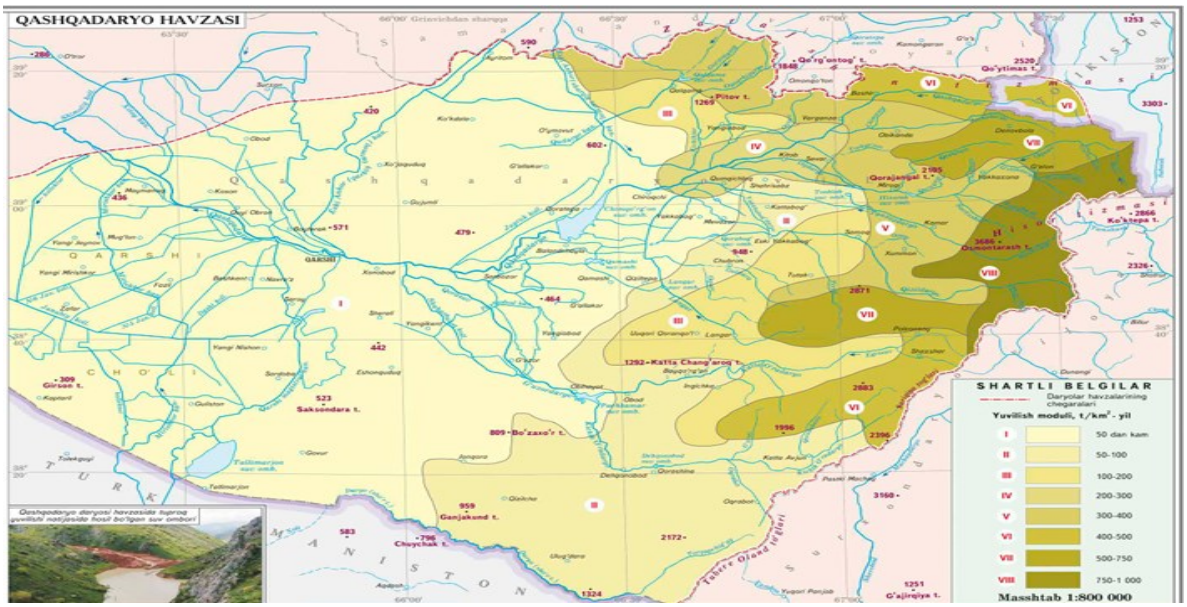
Qashqadaryo viloyatining suv resurslari 51,5m^3/sek. dan iborat bo`lib, havzaning tog`li qismida oqim moduli har 1 km^2 maydondan 6,2 l/sek. ni tashkil etadi [Babushkin va b., 1985]. Qashqadaryo havzasi doirasida shakllanadigan yuza suvlarining oqimi 600 mln. m^3 dan 1,9 mlrd. m^3 gacha o`zgaradi. Muvaqqat suv oqimlari hisobga olinganda bu ko`rsatkich 1,18 mlrd. m^3 ni tashkil etadi. Har 1 km^2 maydondan har yili 45,1 ming m^3 suv to`planadi. Qashqadaryoning o‘rtacha yillik suv sarfi 49,6 m3/s ni, o‘rtacha yillik oqim hajmi 1,56 km3 ni, eng ko‘pyillik oqim hajmi 2,72 km^3ni, eng kam yillik oqim hajmi 0,897 km^3 ni tashkil etadi.



2- rasm. Daryolarning to'yinish manbalari

Suv resurslarining tarkib topishida muzliklar ham muhim ahamiyatga ega. Qashqadaryo havzasida (Oqsuv va Yakkabog‘daryo manbalarida). Oqsuv havzasidagi eng yirik muzliklar Xonaqasuv, Botirboy va G‘ilondaryoning manbalarida joylashgan Seversov, Botirboy va To‘rtqo‘yliq muzliklaridir. Yakkabog‘ daryosi havzasidagi muzlanish Oqsuv havzasidagiga nisbatan ancha kam. Yakkabog`daryosining boshlanish irmog‘i bilan Shulhazor daryosining havzasida uzunligi atigi 1 km ga yaqin bo‘lgan muzlik joylashgan. Yakkabog‘ daryosi havzasidagi muzliklarning umumiy maydoni 1,5 km^2 ga yaqin. Bu yerdagi muzliklar morenalar bilan qoplangan.

Qashqadaryo havzasida gidrologik va xo‘jalik ahamiyatiga ega bo‘lgan yirikroq ko‘llar yo‘q. Havzaning tog‘li hududida maydaroq ko‘llar mavjud (3-rasm). Ulardan nisbatan yirikrog‘ini G‘oziko‘l hosil qiladi. Katta O‘radaryo yuqori oqimidagi 1,5 km^2 maydonni egallaydigan Turobbobo va Kichik O‘radaryo boshlanishidagi Xojabulg‘ir ko‘llari paydo bo‘lishiga ko‘ra karst jarayonlari bilan bog‘liq, ularning chuqurligi 16 m gacha yetadi.



3- rasm. Qashqadaryo havzasi

Qashqadaryo havzasi shakllanish hududidagi o‘rtacha ko‘p yillik oqim taqsimlanishi 1- jadvalda ko‘rsatilgan.

Daryo – gidrostvor nomi	F, km2	H, km	W, mln, m 3	Q, m3 /s	M, l/s·km2	Oqim qalinligi h, mm	Δ oqim	Cv
Qashqadaryo - Varganza q	511	1,80	164,5	5,22	10,2	322	0,165	0,387
Jinnidaryo - Jauz q.	152	1,97	49,1	1,56	10,3	323	0,108	0,39
Qorabuloq	22,0	1,19	37,4	1,19	45,6	1438		
Okdaryo - Hisarak q.	755		406	12,9	17,1	537	0,666	0,347
Qorasu -Ulyan q.	139	1,83	49,4	1,57	11,3	357	0,287	0,386
Tanxozdaryo - Kosatarash q.	438	2,21	129,2	4,11	9,44	297	0,449	0,304
Yakkabog‘daryo - Tatar q	514	2,73	192,6	6,11	12,1	382	0,444	0,292
Tirna - Ishkent q.	151	2,34	43,4	1,38	9,11	287	0,168	0,410
Guldaryo - Guldara q.	24,4	2,34	5,7	0,18	7,36	238	0,435	0,338
Jar - Qanjig‘ali q.	124	1,37	42,2	1,34	10,8	341	0,009	0,510
Langar – Kaltasoy q	180	1,79	23,3	0,74	4,09	129	0,223	0,437
Kichikuradaryo – Gumbuloq q	2000	1,42	53,2	1,69	0,84	26,6	0,134	1,03
O‘radaryo - Bozortepa q.	1250	1,85	151,8	4,81	3,85	121	0,248	0,476

1-jadval. Qashqadaryo havzasining suv resurslari (V.E. Chub ma’lumotlariga ko‘ra)

Qashqadaryo viloyatida yangitdan o‘zlashtirilgan va sug‘oriladigan yerlar maydonining kengayishiga bog‘liq holda ko‘llarning yangi tupi – irrigatsiya-tashlama ko‘llarning vujudga kelishi kuzatilmoqda (Sechan va b.).

Qashqadaryo havzasiga mansub bo‘lgan daryolarda suv sarfining yil davomida mavsumlar bo‘yicha o‘zgarib turishi, notekis taqsimlanishi hamda qishloq xo‘jalik ekinlarini sug‘orish davri ehtiyojlari orasida katta tafovvut mavjud. Yuqorida ta’kidlab o‘tilganidek, Qashqadaryo tizimidagi daryolarning aksariyat katta qismi qor va yomg‘ir suvlaridan to‘yinishi sababli ularda to‘lin suv davri bahorning oxiri va yozning boshiga (may – iyun) to‘g‘ri keladi, qishloq xo‘jalik ekinlarini sug‘orish ehtiyoji esa iyulь va avgust oylarida kattaroq bo‘ladi.

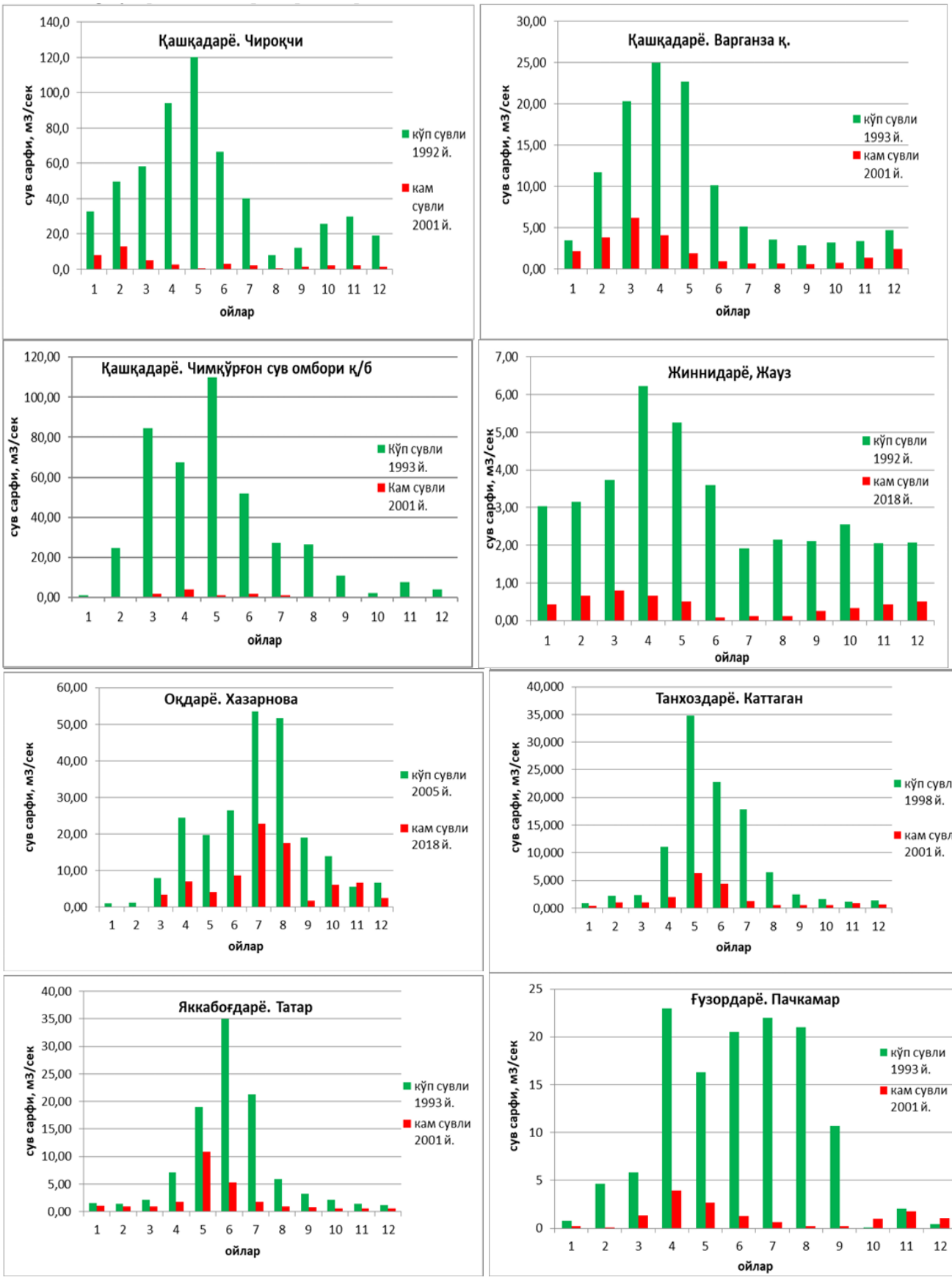
Respublikamizning janubiy viloyatlaridan biri Qashqadaryo viloyatining iqlimi kontinental subtropik iqlimga xos bo‘lib, yozi issiq va quruq, qishi esa nisbatan sovuq hisoblanadi. Viloyatda yog‘in miqdori g‘arbdan sharqqa qarab balandlik oshishi bilan joy relyefiga qarab oshib boradi.

Quyidagi jadvalda Qashqadaryo viloyatidagi atmosfera yog’inlarining o’rtacha ko’p yillik qiymatlari aks etgan (2-jadval).

№	Meteorologik stansiyalar	Mutloq balandligi, m	Atmosfera yog‘inlari, mm
			1980 - 2022 y
1	Muborak	288	193
2	Qarshi	378	253
3	Chimqo‘rg‘on	465	364
4	G‘uzor	524	359
5	Shaxrisabz	633	551

2-jadval. Viloyatdagi atmosfera yog‘inlarining o‘rtacha ko‘p yillik qiymatlari

Daryolarda suv rejimining yog‘in – sochin bilan bog‘liqligini nazarda tutgan holda daryolarning oqimini tartibga solish va boshqarish hamda mahalliy suv resurslaridan samarali foydalanish maqsadlarida viloyat hududida 2 533,7 mlrd. m^3 miqdoridagi «obi - hayot»ni o‘zida jamlagan 14 ta sug‘orish suv ombori barpo etildi va ularning suv resurslari hozirgi paytda sug‘orishda va boshqa maqsadlarda foydalanilmoqda. Ulardan 4 tasining hajmi 20 mln. m^3 dan 386 mln m^3 gacha bo‘lib, ularning umumiy suv yig‘ish hajmi 2455 mln. m^3 yoki viloyatdagi suv omborlaridagi suvning 96,6 % ini tashkil etadi. Ulardan eng yirigi – Qarshi bosh kanalidan Amudaryo suvi bilan to‘ldiriladigan Tallimarjon suv omborining hajmi 1525 mln. m^3 [4,5,6]. Suv omborlaridan foydalanish daryolar suv sarfini boshqarishda asosiy samarali usul hisoblanib, ularning ahamiyati suv kam yillari yaqqol ko‘zga tashlanadi. Suv omborlari suv oqimi yetarlicha bo‘lgan va yil davomida kuchli o‘zgarib turuvchi daryolar havzalarida keng ko‘lamda qo‘llanilmoqda.



4-rasm. Qashqadaryo havzasidagi daryolarning yil davomida suv sarflarining o‘zgarish dinamikasi

Hududni tog‘li qismida hammasi bo‘lib yiliga o‘rtacha 1,6 mlrd. m3 suv miqdori hosil bo‘ladi. Mutaxassislarning hisob-kitoblariga ko‘ra, Kitob, Shahrisabz botig‘i va Qashqadaryoning yuqori oqimidagi to‘rtlamchi davr yotqiziqlari orasidagi yer osti suvlarining zahira miqdori 1,0 mln. m3 dan ko‘proq bo‘lib, ular 5500 ga yaqin artezan quduqlar orqali olinadi. Daryo o‘ng irmog‘i O‘rtabuloqning (Forob qishlog‘i yonida) quyilishigacha Shinchasoy deb ataladi. Uning uzunligi 332 km, suv yig‘ish maydoni 8750 km2. Hozirgi kunda uning suvi ko‘plab sug‘orishga sarflanishi oqibatida ancha yuqorida tugab qolmoqda. Qashqadaryo viloyatida ekinbop yerlar bilan suv resurslari o‘rtasidagi tafovutga barham berish maqsadida bir qancha ishlar qilindi. Natijada antropogen gidrografik tarmoqlar hosil bo‘ldi. Jumladan, Qashqadaryoda Chimqo‘rg‘on suv ombori, G‘uzordaryoda esa Pachkamar suv ombori qurildi. Daryolar suvidan unumli foydalanish maqsadida bu hududda 15 ta suv ombori barpo etilgan. Suv omborlari sug‘orishdan tashqari, bahor oylarida bo‘ladigan suv toshqinlarini oldini olishda juda qo‘l keladi.

Bundan tashqari Qashqadaryo havzasiga Zarafshon daryosidan suv keltiruvchi Eski Anhor kanali hamda 1969-1970 yillar davomida qudratli nasos stansiyalari o‘rnatilib, Amudaryo suvini keltiruvchi Qarshi magistral kanali qurib bitkazildi. Uzunligi 200 km dan ortiqroq bo‘lgan bu kanal Qashqadaryo etagiga sekundiga 70 m3, ya’ni butun Qashqadaryo havzasining yillik oqimidan deyarli 1,5 barobar ko‘p suv keltirmoqda.

O‘zbekiston Respublikasi Gidrometeorologiya xizmati markazi (O‘zgidromet) ma’lumotlariga asosan Qashqadaryo suv havzalaridagi suv resurslarining bugungi kundagi holatini baholash mumkin. Tadqiqot ishida daryo oqimining yil davomida o‘zgarish dinamikasi tahlil qilindi. Buning uchun havzadagi yirik daryolar – Qashqadaryo (Varganza q.), Jinnidaryo (Jauz q.), Tanxozdaryo (Qatag‘on q.), Yakkabog‘daryo (Tatar q.) va Oqdaryo (Xazarnova q.) postlarida qayd etilgan o‘rtacha oylik suv sarflari haqidagi ma’lumotlar asosida daryo oqimining yil davomida taqsimlanish o‘rganib chiqildi (2-rasm). V.L.Shuls va L.I.Shalatovalar Qashqadaryo havzasi daryolarini to‘yinish xususiyatiga ko‘ra 3 guruhga ya’ni, qor-muzlik; qor va qor-yomg‘ir suvlari bilan to‘yinadigan turlarga ajratadi.

Qashqadaryo qor-yomg‘ir suvlaridan to‘yinadigan daryolar turiga kiradi. Daryoning o‘rtacha yillik suv sarfi Varganza qishlog‘i yonida - 4,1 m³/sek.dan 1,45 m³/sek.gacha, Chiroqchi qishlog‘i yonida eng ko‘p suv sarfi 781 m³/sek. dan (ko‘p suvli yilda) 21,4m3/sek.gacha (kam suvli yilda) bo‘ladi.

Grafiklardan daryo oqimining oylar bo‘yicha o‘zgarish dinamikasi turlicha ekanligini ko‘rish mumkinki. O‘rganilgan barcha daryolarda o‘rtacha oylik suv sarflarining maksimal qiymatlari iyun oyiga to‘g‘ri kelsa, minimal qiymatlari dekabr–yanvar oylarida kuzatilgan. Oqsuv daryosida iyun–avgust oylarida oqimning 72% oqib o‘tsa, Yakkabog‘daryoda may–iyunda 46%, Tanxozdaryoda esa 39%. Ushbu daryolar Qashqadaryo oqimining shakllanishida muxim rol o‘ynaydi. Qor-muzlik suvi bilan to‘yinadigan daryolarga Yakkabog‘daryo, Tanxozdaryo va Oqsuv daryolari mansub bo‘lib, ular asosiy suvini havzada to‘plagan qor suvlaridan oladi. Muzlik suvi esa ikkinchi o‘rinda turadi. To‘yinish xususiyatlariga ko‘ra qor

muzlik suvi bilan to‘yinadigan mazkur daryolarda to‘linsuv davri havzaning boshqa daryolariga nisbatan kechroq kuzatiladi. Ayni paytda, bu daryolar havzaning eng sersuv daryolari ham hisoblanadi.

Har uchchala daryoda ham eng ko‘p suv sarflari asosan iyun oyiga, eng kam suv sarflari esa dekabr-yanvar oylariga to‘g‘ri keladi. Bu daryolarda oqimning yil davomida taqsimlanishi juda notekis. Qor suvi bilan to‘yinadigan daryolarga suv yig‘ish maydonining o‘rtacha balandligi 1823 metrga teng bo‘lgan Qashqadaryo kiradi. Bu daryoda eng ko‘p o‘rtacha oylik suv sarflari aprel oyida va eng kam o‘rtacha oylik suv sarflari esa yozning oxiri va kuzning boshida kuzatiladi (3-rasm). Jinnidaryo, Qorasuv, Turnabuloq, Langar va G‘uzordaryolar qor-yomg‘ir suvlari balan to‘yinadigan daryolardir. Suv sathlari o‘zgaruvchan, ya’ni suv to‘plash maydonlari pastda joylashgan va erigan qor suvlari hisobiga to‘yinadi. Shuning uchun eng ko‘p suv sarflari asosan aprel oyida kuzatiladi. Lekin, ularda oqim miqdori ayniqsa, eng ko‘p suv sarflari yil sayin o‘zgarib turadi, chunki ularda to‘linsuv davri ko‘proq jala yomg‘ir hisobiga hosil bo‘ladi.

Qashqadaryoning o‘ng irmoqlari orasida nisbatan sersuv Qalqimasoy va Oyoqchisoylardir. Qalqimasoyning o‘rtacha yillik suv sarfi 2,88 m3/s, o‘rtacha oqim moduli 7,9 l/s·km2. Oyoqchisoyda bu ko‘rsatkichlar 1,37 m3/s va 10,9 l/s·km2 ga teng.

Qashqadaryo havzasining tog‘li qismida (8780 km2) hammasi bo‘lib o‘rtacha hisobda sekundiga taxminan 50 m3 yoki yiliga 1575 mln.m3 miqdorda oqim hosil bo‘ladi. Qashqadaryo havzasining o‘rtacha oqim moduli 5,7 l/sek·km2 ga teng. Havzaning tog‘li qismida hosil bo‘lgan oqimning hammasi uning tekisliklar qismidagi yerlarni sug‘orish uchun sarf etilib,qolgan qismi bug‘lanib ketadi.

Mutaxassislar tomonidan sug‘orishda ishlatiladigan suv miqdori 2050 yilga borib 15%ga kamayishi bashorat qilinmoqda, bu esa butun xalq xo‘jaligiga, ayniqsa axoli suv ta’minotiga salbiy ta’sir ko‘rsatadi. Transchegaraviy daryo hisoblangan Amudaryo havzasidagi Qashqadaryoning gidrologik rejimning o‘zgarishi, suv toshqini, suv bilan bog‘liq bo‘lgan kasalliklarning kuchayishi, qurg‘oqchilik oqibatida hosil bo‘ladigan hosildorlikning yomonlashuvi kuzatilishi mumkin.

Xulosa. Olib borilgan tadqiqotlardan ko‘rinib turibdiki, bugungi kunda zamonaviy texnologiyalar: geoaxborot tizimi (GAT) va masofadan zondlash ma’lumotlari yordamida dunyo olimlari tajribasidan kelib chiqib, Qashqadaryo xavzasi misolida suv resurslardan oqilona foydalanishda raqamli haritalar tizimini yaratish iqtisodiy va ijtimoiy sohalarda birmuncha yengillik va qulay imkoniyatlar beradi. Zamonaviy texnologiyalar: jumladan geoaxborot tizimi (GAT) va masofali zondlash ma’lumotlar elektron ko‘rinishda bo‘lib, hududiy hamda mintaqaviy kesimdagi suv resurslaridan to‘g‘ri va barqaror foydalanishning istiqbolli strategiyasi ishlab chiqishda asosiy omil hisoblanadi. Qashqadaryo viloyati qishloq va suv xo`jaligi boshqarmasining ma`lumotlariga ko`ra, havza bo`yicha suv limiti hozirgi sharoitlarda 5,6-5,7 km^3 bo`lib, shundan 5,4-5,5 km miqdordagi suv sug`orishga sarflanadi. Sug`orishga sarflanadigan suvlarning 0,1-0,3 $km^3$ ini qayta foydalaniladigan suvlar tashkil etadi. Sug`orich kanallari muhandislik inshootlari

sifati tabiiy landshaftlarning o`zgarishida va antropogen landshaftlarining shakllanishida muhim ahamiyatga ega.

Hozirda respublikamizda “O‘zbekiston Respublikasi suv xo‘jaligini rivojlantirishning 2020 - 2030 yillarga mo‘ljallangan konsepsiyasi” qabul qilingan bo‘lib, hukumat Suv xo‘jaligi vazirligiga Konsepsiyada belgilangan ustuvor yo‘nalishlarni amalga oshirish orqali 2030 yilga qadar quyidagi ko‘rsatkichlarga erishishni ta’minlash yuklatilgan:

- sug‘orish tizimlarining foydali ish koeffitsiyentini 0,63 dan 0,73 gacha oshirish;
- suv ta’minoti past darajada bo‘lgan sug‘oriladigan yer maydonlarini 560 ming gektardan 190 ming gektargacha kamaytirish;
- sho‘rlangan sug‘oriladigan yer maydonlarini 226 ming gektarga kamaytirish;
- Suv xo‘jaligi vazirligi tizimidagi nasos stansiyalarining yillik elektr energiyasi iste’molini 25 foizga kamaytirish;
- barcha irrigatsiya tizimi obektlariga «Smart Water» («Aqlli suv») suv o‘lchash va nazorat qilish qurilmalari o‘rnatilib, suv hisobini yuritishda raqamli texnologiyalarni joriy etish;
- 100 ta yirik suv xo‘jaligi obektlarida suvni boshqarish jarayonlarini avtomatlashtirish;
- qishloq xo‘jaligi ekinlarini sug‘orishda suvni tejaydigan texnologiyalar bilan qamrab olingan yerlarning umumiy maydonini 2 mln gektargacha, shu jumladan tomchilab sug‘orish texnologiyasini 600 ming gektargacha yetkazish;
- suv xo‘jaligida davlat-xususiy sheriklik tamoyillari asosida 50 ta loyihani amalga oshirish.

Suv tanqisligini yumshatish uchun mamlakatimizning janubiy viloyatlarida (xususan Qashqadaryo viloyati misolida) hududning o‘ziga xos sharoitlarini hisobga olgan holgan yomg‘ir suvlarini yig‘ish orqali aholi tomorqa maydonlari uchun eng qulay ekin/daraxt turlarini tanlagan holda tejamkor sug‘orish usulini joriy etishning keng aholi qatlami uchun hamyonbop texnologiyasini loyihalash va qurish asoslarini ishlab chiqish muhim masala hisoblanadi.

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CURRENT ISSUES OF ALTERNATIVE ENERGY

Annotation: *The article analyzes the estimates of international organizations that due to economic development, the demand for energy will increase by more than 50% by 2030 compared to the beginning of the century, and the total demand will be very high, resulting in a negative impact on the environment.*

Keywords: *alternative energy sources, renewable energy, solar power, atmosphere, solar power plants, carbon dioxide, wind power plants*

According to international organizations, due to economic development, by 2030 the demand for energy will increase by more than 50% compared to the beginning of the century, and the total demand will be 23.27 billion tons of conventional fuel. This means that the negative impact on the environment is growing.

If such rates continue, it is estimated that the reserves of black gold on the planet will last only 55-60 years. This period is estimated at 70-75 years for natural gas and 150-160 years for coal. In addition, the sustainable use of hydrocarbon resources is degrading the environment and human health, climate change is being observed, and the ozone layer is being depleted. According to experts, 5 billion tons of carbon dioxide are released into the atmosphere every year. tons of carbon dioxide, about 300 million. tons of carbon monoxide. This is 3.5 times more than in the first half of the twentieth century.

Under these conditions, it is natural that the widespread use of alternative energy sources will be on the agenda. This is due to the fact that their types of solar, hydro and wind energy, as well as biomass, are almost unique and renewable, very relevant to the current era of innovative development, and the creation of new jobs. In addition, the equipment and technology working on this basis are environmentally friendly, environmentally friendly and do not lead to man-made disasters.

At present, 10.2% of all energy produced in the world comes from renewable energy sources. By 2050, its share in some species is expected to exceed 70%.

Under these conditions, it is natural that the widespread use of alternative energy sources will be on the agenda. This is due to the fact that their types of solar, hydro and wind energy, as well as biomass, are almost unique and renewable, very relevant to the current era of innovative development, and the creation of new jobs. In addition, the equipment and technology working on this basis are environmentally friendly, environmentally friendly and do not lead to man-made disasters.

Map of solar flux to the surface According to the study, the solar flux per 1 m2 of land perpendicular to the center of the sun (at the time of entering the Earth's atmosphere) is 1367 W / m2 (when the sun is constant). As a result of the absorption of sunlight into the Earth's atmosphere, the high solar flux above sea level is equal to 1020 W / m2 (at the equator). However, at different times of the day, the angles of incidence of the sun's rays on the ground change slightly due to changes. In winter, this figure can be reduced by 2 times. Solar power plants have advantages and disadvantages, just as each process has advantages and disadvantages. Advantages of solar power plants: - Prospective, renewable source; - Environmentally friendly and cost-effective; - Renewability of fuel source; - Increased demand for alternative energy sources; - Minimum impact on environmental climate change.

Disadvantages of solar power plants: - Dependence on weather, seasons and time of day for power generation; - The need for additional traditional energy sources in the field of industrial production; - Regular dusting of the panel surface; - Occupying a lot of space. Figure 2. Solar photovoltaic device and consumers: 1 – photoelectric module (solar panel); 2 - inverter charging control device; 3 - rechargeable battery; 4– Consumers The world's demand for electricity has grown by about 50% over the last 5 years. By 2050, solar power plants will reduce carbon dioxide emissions to the environment by 20-25% of annual electricity. Converting only electricity from sunlight to heat energy is a useful example. The Sun alone sends so much heat to our planet every day that it is 20 times more energy consumed by the world's population year-round. Accordingly, last year, 120 billion solar cells were installed at solar stations around the world. More than kWh of electricity was generated. In a number of developed countries, including Germany, the share of non-conventional energy is planned to reach 15% by 2015 and 25% by 2020.

According to statistics from the Department of Energy, in 2001 (solar electricity) the energy received from solar collectors was $ 0.09–0.12 per kWh, and by 2015–2020 this value will reach $ 0.04–0.05 and increase economic efficiency. Currently, there are companies around the world that produce solar photovoltaic cells, including:

China Yingli - 2300 MW, USA First Solar - 1800 MW, China Trina Solar - 1600 MW, Canada Canadian Solar - 1550 MW

Korea produces high-quality competitive solar photovoltaic cells Hanwha SolarOne - 750 MW

In the first half of 2020, the volume of energy from fossil fuels, the most polluting fuel, decreased by 8.3%.

Analyzes show that many large countries, including China, the United States, India, Japan, Brazil and Turkey, get at least 10 percent of their total energy from wind and solar. Britain and the European Union deserve special praise, as they receive 21 and 33 percent of their energy from renewable sources, respectively.

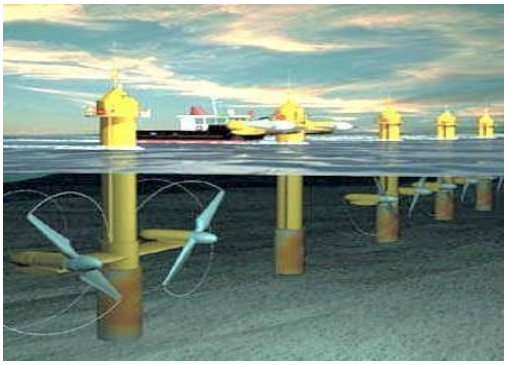
According to the forecasts of the Global Wind Energy Council (GWEC), by 2030 the volume of offshore wind energy worldwide may increase from 29.1 GW in 2019 to 234 GW.

The world's largest sales turbine based on the principle of rise and fall. The turbine, which operates on the basis of the principle of the rise and fall of the water supply, converts the kinetic energy of the water flow into the electric current, which comes in the same direction as the wind turbine. The world's largest hydroelectric power plant near Northern Ireland has a capacity of 1.2 MW. It consists of 2 grain turbines with a diameter of more than 20 m. Due to the rotation of the turbine's turbine system, the turbine and the waves are adapted to each direction. To service the turbine, it may be lifted from the water.

The cost of 1 MW of installed power produced by such a system

5 million equal to a dollar. This is the cost of offshore wind turbines

30% more. However, in 2015, off the coast of South Korea, the cost of 820 million. It is planned to install a turbine operating on the principle of rising and falling water levels with a capacity of more than 1 MW. It is noteworthy that the



widespread introduction of such "green technologies" in agriculture, energy, waste management, transport, education and science in our country will create more than 550,000 new jobs over the next ten years.

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ELECTRICITY AS A KEY TO ADVANCED PEDAGOGICAL TECHNOLOGIES

Annotation: *"Differentiation" to improve is the efficiency of the educational process, depending on the abilities of students. To divide students into groups and assign group assignments to students according to their abilities, teaching and monitoring their individual skills.*

Keywords: *"Differentiation", DTS, pedagogical technology, groups, abilities, mastery, creativity, research, reproductive.*

Problems of differentiated education have been studied in world pedagogy for many years, and in this regard, there are a number of scientific and practical works [1]. In particular, the consideration of the theoretical foundations of differentiated education as a special problem dates back to the beginning of the twentieth century [2]. Among the scientists-educators who conducted research in this area - R. Dotrens from France, K. Waschburn from the USA, B. Bloom, D. Griffin from England, G. Kohansky from Germany, S. Wagner from Austria, N. Shakhmaev from Russia, Butuzov I., Unts I.

Some aspects of this problem in Uzbekistan were touched upon by M. Salaev, G. Safoev, N. Bekbaev, N. Nigmatov, Sh. Mustafayev [3].

The concept of "differentiation of education" comes from the Latin word "differential" – "different", which means the division of a category into different parts, differing in form, part, degree, class [4].

Differential education for the purpose of allowing certain parts of the educational process and the implementation of didactic content, tools, and methods to the form of the complex [5]. The basic gist of it – learning is the priority to decide on the outcome of the process, then the possibility of each person the ability to read and buck, teach readers to work in different groups of technologies are listed [6-8].

This technology advantages:

-Teachers in the development of low push the help of the students, the high master push students to give attention to the opportunity will arise;

-The pace of getting the readers knowledge and increases the quality of mastering of knowledge;

-Available in person, increases the level of kontsepsiyasining, the development of high push readers to their own abilities , to show the master push low - knowledge readers the joy of leads to be able to;

-The knowledge and increases the need to get readers interested;

-In the different classes of readers (gomogen, geterogen) is created to allow you to work in small groups.

Differentsiallashtirish for the teacher on a certain topic to read three different levels: a creative, V-research S-reproductive character is made up of educational assignments [9]. Thus, readers at a certain level of knowledge, skills and qualifications and be possessed of their knowledge in such areas as taking to ensure the independence of the complexity is provided [10].

It would be noted that, differentiated approach should push the development of the training mission in concluding that the readers are made on the basis of the educational material. This and the requirement for teachers to be closer with the content of the course, students must master push to put the knowledge and skills that are the minimum requirements which should be well aware of students [11].

The development of knowledge and skills that students must push the subject on the basis of partial izlanishli and creative assignments, the development of knowledge, deepening and consolidation, that is, for each of the participants of the teaching process interesting and useful, will contribute to the development of the person

With differentiated teaching, teaching taking into account the individual characteristics, abilities, interests, needs of each student creates an individualized teaching.

Individualized training is a form of training, a model of the organization of the educational process, which has the following features:

- The teacher works with each student individually;
- Each student performs educational tasks developed in accordance with his personal characteristics, abilities, interests, needs, that is, individually works with teaching aids (textbooks, visual and didactic materials, computer technology).

The advantage of an individual's training, readers of educational activities organization, educational content, tools and methods in the selection of their personal characteristics were taken into account, and therefore speeding up the process, their educational mission in the fulfillment of the right approach and quicklyadapted roq arguably, is to create the opportunity to master the knowledge and skills at the level of their options.

Differentiated education, a view of modern educational technology toe'become the teaching of disabled students and their options-psixologik defined by diagnosis as a result of the educational work of the organization and methods of teaching in different forms because of the wide application process.

The function of the teacher read from, teach to knowledge, from knowledge independent of the position is to support the readers if educational needs to remedy the defect, and create the environment should send to do it responsibly.

Educational teaching decide on the outcome of initiative and independence, knowledge of thisthorough and deep rni, including the development of the necessary qualifications and skills themin kuzatuvchanlik the bog'lanishli thought and speech, memory and creative imagination that allows them to educate the education system [12]..

In such a system, the reader also, the teacher also are jointly responsible to the educational process. Together they have the knowledge and ability of each student, will determine the needs of the individual.

In the process of differentiated education, a wide roud to democratization opens, students have the opportunity to freely express themselves, a favorable environment is created, the independent opinion of each student is taken into account, as well as the formation and development of individual, creative thinking.

As a result of differentiated learning:

1. All students in the group have the opportunity to master the program materials.

2. There is a creative growth of knowledge and skills of all students in the group, their interest in science increases.

3. The activity of all students in the group increases. Because every student from the low achievement group tries to move to the high achievement group.

High master referencein s group , while students with low development I will try not to fall into the group.

Differentiated education training also holds a special place in the system.

Effective training system in connection with the passage of the duration of the course and the duration will change. Pedagogical staff by categories differentiated long-term and short-term courses are offered. The pedagogical staff of the scientific and methodological aspects of each of these depending on training from preparation-the subject of improvement plansthe resurrectiongan option makes it easy to create require.

Differentiated education followDintroduction, first of all, it is necessary to study its theoretical and practical basics.

1. In the developed countries differentiated education, scientific research on the practice of their application to study and work in the us compared with the result of scientific research in this area created the optimal option is created.

2. Differentiated education system necessary for special educational introduction to the practice of educational-methodical complexes, scientific methodical recommendations, material-technical base of the creation is of critical importance.

To increase the knowledge of reading independently developed democratic countries, raising the skills of teachers in the educational institutions of the most common form. This form of qualification raising educational servicestof the world competitive market, the creative labor of the pedagogical staff effective mechanism of stimulating it in a place where there issthe night, and development.

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ENERGIYA TEJASHNI MASALALARIDAN BIRI, REAKTIV QUVVATNI KOMPENSATSIYALASH

Annatatsiya. *Reaktiv quvvatini sexda konpensatsiyalangandan keyin to‘la quvvat aniklash uchun, korxona elektr yukini xisoblash kerak.*

Kalit so‘zlar: *Transfarmator, kandensator, akumlyator, vazipi, liniya uzunligini aniqlab hisoblab chiqamiz va aniq tanlashimiz kera.*

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ONE OF THE ISSUES OF ENERGY SAVING IS REACTIVE POWER COMPENSATION

Annotation. *In order to determine the total power after the reactive power is compensated in the shop, it is necessary to calculate the electrical load of the enterprise.*

Keywords: *Transformer, capacitor, accumulator, function, line length, we need to calculate and make a clear choice.*

Agar korxona uchun talab qilingan reaktiv quvvati Qk.u<50kVAR, shu korxonada kondensator batareyasini PUE orqali konpensatsiyalovchi qurilmani tanlanmaydi. Qk.u<50kVARdan ko‘prok bo‘lsa, KKU-0,4 tenglash kerak.

Zavod yuklamasini aniqlashda xisobiy yuklamani aniqlashning talab koeffitsenti xisobiy (1000 V va undan yuqori) aktiv va reaktiv yuklamalari sexlarning xisobiy yoritish yuklamalari. Zavod maydonini yoritish yuklamasini xisobga olgan xolda topiladi. Kuchlanish 1000 V gacha bo‘lgan yuklamali iste’molchilar o‘zgruvchan grafikli yuklamalardir. 1000 V dan yuqori bulgan kuchlanishli yuklamalar o‘zgarmas grafikli yuklamalar deb qabul qilingan.

Kushlanishi 1000 V gacha bo‘lgan iste’molchilarning umumiy xisobiy yuklamasi quyidagicha aniklanadi:

$$\sum P_{p1} = \sum P_{p1} + \sum P_{p0};$$

$$\sum Q_{p2} = \sum Q_{p1} + \sum Q_{p0};$$

Q_{p0}- gaz razryadli yoruglik manbasi ishlatilganda xisobga olinuvchi xisobiy reaktiv quvvat, kVt

K-sexlarning soni:

$\sum$ $\mathbf{P_{p0}}$-yoritishga sarf xisobiy aktiv quvvat kVt.

$\sum$ $\mathbf{Q_{p0}}$-yoritishga sarf bo‘ladigan xisobiy reaktiv quvvat kVAR. Sex podstansiyasi transformatordagi quvvat yo‘qotilishi takriban quyidagicha xisoblanadi;

1. Korxona uchun reaktiv quvvat qiymatini aniqlaymiz

Qr = Rr · tg φ

2. Kompensatsialovchi qurilmalarning reaktiv quvvatini topamiz:

Q k.k = Rr (tg φ_1 – tg φ_2)

bu erda **tg φ_2 = 0,33**

3. Kondensator batareyasini tanlaymiz.

KKU - komplekt kondensator qurilmalar 380V.

4. Korxonaning kompensatsiyalangandan keyingi reaktiv quvvatini xisoblaymiz:

Q p.k = Qr - Qk.u

5. Kompensatsiyalangandan keyingi to‘la quvatni aniqlaymiz.

$$\mathbf{Sk.k} = \sqrt{\mathbf{P_p^2} + \mathbf{Q_{п.к.}^2}}$$

Korxonaning 1 yildagi elektroenergiya sarfini xisoblaymiz.

W yil kor = W yil k · Ktt · Ktk

7. Korxonada foydalanilgan elektro energiya uchun abonent to‘lovini aniqlaymiz.

Skor = a · P max + V · W yil. kor.

Statistik kondensator batareyalari, sinxron yuritgichlar va elektr energiya sarfini 50% gacha kamaytirish imkonini beradigan sinxron kompensatorlar kurinishidagi reaktiv quvvatni qullash.

Reaktiv quvvat sex va korxona jamoa binosiga kompensatsiyalangan keyingi to‘la quvvat aniqlansin. Agar korxona uchun talab qilingan quvvat $S_{max.tal}$>750 kvA va shu korxona jamoa binosi uchun (byudjet, nosanoat) bo‘lsa, kompensatsiyalovchi qurilma tanlansin va foydalanilgan energiya davlat enargiya nazorati bilan abonent to‘lovi amalga oshirilsin.

Topish kerak: $S_{ПК} - ?$ $\Delta Ц - ?$

1. Korona hisobiy reaktiv quvvati

$$Q_{Рдк} = P_{Рдк} tg\varphi = P_{Рдк}(\arccos(0.75)) = 2700 * 0.88 = 2381.17 \qquad кВАр$$

2. Kompensator qurilmasining reaktiv quvvati

$$Q_{ку} = P_P(tg\varphi_1 - tg\varphi_2) = 2700(0.88 - 0{,}328) = 1495{,}53 \qquad кВАр$$

$tg\varphi_2 = 0{,}328 \qquad (0{,}29 \div 0{,}4)$

Kompensatsiyalovchi qurilma tanlaymiz: $Q_{ку} = 5 \cdot 300 = 1500 \qquad кВАр$

3. Kompensatsiyadan keyingi reaktiv quvvat

$Q_{ПК} = Q_{Рдк} - Q_{КУ} = 2381{,}17 - 1500 = 881{,}17 \qquad кВАр$

4. Kompensatsiyadan keyingi to‘la quvvat

$S_{ПК} = \sqrt{P_{Рдк}^2 + Q_{РПК}^2} = \sqrt{2700^2 + 881{,}17^2} = 2840{,}15 \qquad кВА$

5. Sex uchun bir yildagi elektr energiya sarfi

$W_{цех} = W_1^1 K_{TT} K_{TH} = 1600 \cdot \frac{200}{5} \cdot \frac{1000}{100} = 640000 \qquad кВт \cdot соат$

6. Korxona uchun bir yildagi elektr energi sarfi

$W_{кор} = W_2^1 K_{TToTo} = 1800 \cdot \frac{400}{5} = 144000 \qquad кВт \cdot соат$

7. Iste’mol qilingan elektr energisining moliyaviy xarajati

$\alpha = 34000 сум/кВт.ч \qquad \beta = 16{,}00 сум/кВт.ч$

a) Sex uchun

$Ц_{цех} = \alpha P_{заяв.} + \beta W_{цех} = 34000 \cdot 3100 + 16{,}00 \cdot 640000 = 115640000 \qquad сум$

b) Korxona uchun $\beta = 19{,}60 сум/кВт.ч$

$Ц_{корх} = \beta W_{корх} = 19{,}60 \cdot 144000 = 2822400 \qquad сум$

8. Sarf qilingan elektr energiyasining umumiy xarajati

$Ц_{П} = Ц_{цех} + Ц_{корх} = 115440000 + 2822400 = 118462400 \qquad сум$

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ORGANIZATION OF SOLUTIONS IN A BRIGHT MEDIUM WITH DIFFUSION EFFECT

Abstract: *In this paper the solute transport in a fractured-porous medium is considered with equilibrium adsorption. One the basis of numerical results an influence of adsorption on solute transport characteristics is estimated.*

Keywords: *Convective diffusion; equilibrium adsorption; fractured-porous media; porous block; relative mass transfer; solute transport.*

Introduction

The problem of solute transport in fractured-porous media is encountered under various hydrogeological and ecological processes. A large number of papers have been devoted to the hydrodynamic modeling of the solute transport processes in a porous medium (PM) [1]. As a porous medium with a stagnant zone and certain degree of convention, can be considered as a fractured-porous medium (FPM) with a low permeability of porous blocks. In such FPM, liquid in porous blocks is considered to be stationary, and the system of fractures along which the liquid moves is regarded as a transit pore [2].

Objects and methods of investigation

In this paper, using the model approach, the motion of a dispersed liquid and the adsorbed solute transport into a FPM are examined taking into account the convective diffusion and dispersion effects. The main attention is paid to longitudinal convective diffusion in fracture and its effect on the adsorption of solute.

In order to investigate the solute transport in such media, we consider an element of a FPM consisting of a single fracture and an adjacent porous block (Fig.1). A fracture is a semi-infinite one-dimensional object, so that the solute distribution and the fluid flow along its cross-section are considered as a homogeneous. In such case, the second fracture measurement, i.e. its thickness is not taken into account. The porous block occupies the first quarter of the plane (Fig.1.). Thus, the region $R\left\{0 \le x < \infty,\ 0 \le y < \infty\right\}$ is considered, only.

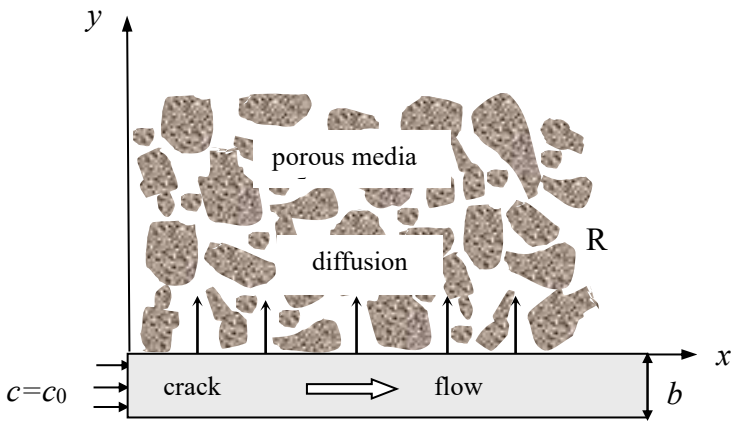

Fig.1. Schematic picture of the transfer of substance and flow in FPM.

In a fracture there is a convective-diffusion solute transport and in a porous block only a diffusion one. Both in fracture and in porous block, the solute can be adsorbed during the transport process.

The liquid in fracture flows at a given constant rate. At the end (x=0) of fracture, the liquid is supplemented by solute with concentration c_0. Initially, the fracture and the porous block are considered to be filled with pure (without substance) liquid.

The fracture is modeled as a one-dimensional object, so the distribution of concentration along its cross-section is not considered. In fracture, the coefficient of convective diffusion D_f^* must be considered as:

$$D_f^* = D^* + \eta \frac{w}{\theta}$$

where D^* is the coefficient of molecular diffusion of the solute (liquid), η the scattering coefficient, $\frac{w}{\theta}$ the physical velocity of the fluid. In fracture, the fluid velocity and the speed of filtration coincide, because $\theta = 1$. Then, we have $D_f^* = D^* + \eta v$, where v is the velocity of the fluid.

The balance equation of the solute transport process and the fluid flow in a FPM with convective diffusion and adsorption can be written as:

$$b\left(\frac{\partial c_f}{\partial t} + \rho\frac{\partial s_f}{\partial t} + v\frac{\partial c_f}{\partial x}\right) = bD_f^*\frac{\partial^2 c_f}{\partial x^2} + \theta_m D_m^*\frac{\partial c_m}{\partial y}\bigg|_{y=0}, \quad 0 \le x < \infty,$$

(1)

$$\frac{\partial c_m}{\partial t} + \frac{\rho}{\theta_m}\frac{\partial s_m}{\partial t} = D_m^*\frac{\partial^2 c_m}{\partial y^2}, \quad 0 \le y < \infty, \qquad (2)$$

where $c_f = c_f(t,x)$ is the solute concentration in fracture, m^3/m^3; $c_m = c_m(t,x,y)$ the concentration in a matrix, m^3/m^3; $s_f = s_f(t,x)$ the concentration of the adsorbed solute in fracture, m^3/kg; $s_m = s_m(t,x,y)$ the concentration of adsorbed matter in a matrix, m^3/kg; D_m^* - effective diffusion coefficient in a matrix,

m^2/s; ρ is the density of saturated medium, kg/m^3; b the fracture width, m; θ_m the matrix porosity coefficient, t - time, s.

Results and its discussion: The Fig. 2. reflects the surface of relative concentration c/c_0 and adsorption s. One can see that on surfaces, an increase in solute concentration in fracture and, accordingly, in the region R, with a small x the solute transport from the fractures into the porous blocks becomes significant. The longitudinal convective diffusion in fracture leads to a smearing of the profiles c_f, which in turn affects the distribution of c_m (Figure 2.a). In turn, convective diffusion leads to an increase in adsorption in the fracture and the porous block (Fig. 2.b), as well as mass exchange between the fracture and the porous block.

The results of calculations of the relative mass transfer Q from a fracture to a porous block are shown in Fig. 3a. Analysis of the graphs shows that for a

certain value of time the increase in the value of convective diffusion in fracture leads to an increase in Q through $y = 0$. Based on the curves in Fig. 3.a. was also estimated cumulative conditional mass transfer Q through $y = 0$

$$Q_{cum} = \int_0^{\infty} Q \, dx$$

for each time point t that characterizes the total mass transfer through $y = 0$ at a given time. In Fig. 3.b. shows graphs of the change Q_{cum} in time t. It can be seen that the cumulative conditional mass transfer first increases in time, then a monotonic decrease its value is observed. At the same time, with an increase in the value of convective diffusion in the fracture Q_{cum}, the growth rate is more accelerated.

In Fig. 3.c. shows the graphs of the total conditional solute transport change through $y = 0$ from fracture to porous block versus time.

$$Q_{sum} = \int_0^t Q_{cum} dt = \int_0^t \int_0^{\infty} Q \, dx dt$$

The graphs show that Q_{sum} increases monotonically with time. In this case, an increase in the value of convective diffusion in the fracture contributes to an increase Q_{sum}.

The results of calculations for different values of the velocity of motion a $\eta = 2 \cdot 10^{-3}$ m, $D^* = 1 \cdot 10^{-6}$ m^2/s in fracture are shown in Fig. 4-5. In Fig. 4. the surfaces c/c_0 are also reflected s for two values v. On surfaces it can be seen that an increase in the velocity of the fluid in a fracture leads to an increase in the distribution of concentration in the region R, which in turn increases the adsorption of the substance.

The nature of the change in the relative mass transfer Q is shown in Fig. 5.a. For $v = 2 \cdot 10^{-3}$ m/s, the relative mass transfer Q is higher in the whole region x than in $v = 1 \cdot 10^{-3}$ m/s and $v = 5 \cdot 10^{-4}$ m/s. This pattern is observed for the cumulative and

relative flow from the fracture to the porous block (Figure 5. b, c). At the same time, with increasing speed, movement in a fracture leads to an increase in Q_{cum} and Q_{sum}

Conclusion: We conclude that an increase of the convective diffusion coefficient leads to an acceleration of the process of the formation of an equilibrium adsorption regime as well as the distribution of concentration in a porous medium. Comparing the data presented, it can be seen that the diffusion rate leads to an increase in the concentration distribution zone, however, higher concentration gradients are formed at the boundary of the fracture and porous block.

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LITOSFERANI OG‘IR METALLAR BILAN IFLOSLANISHI VA ATROF- MUHITGA TA’SIRI

Annotatsiya. *Bugungi kunda respublikamiz qishloq xo‘jaligida, jumladan, tuproq tarkibini yaxshilash va kerakli bo‘lgan ozuqalar bilan to‘yintirish hamda toksik ta’sir etuvchi elementlardan tozalashga qaratilgan ilmiy-amaliy ishlar tizimli yo‘lga qo‘yilgan holda bir qancha natijalarga erishilmoqda. Og‘ir metallar va radionuklidlar Har qanday element tuproqda ortiqcha konsentratsiyada bo‘lsa, o‘simliklar, hayvonlar hamda atrof-muhit uchun zararli ta’sir ko‘rsatadi.*

Kalit so‘zlari*. Qo‘rg‘oshin, nikel, xrom, kadmiy, zux, ftor, tuproq, o‘simliklar, hayvonlar, gerbisidlar, pestisidlar.*

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POLLUTION OF THE LITHOSPHERE WITH HEAVY METALS AND ITS IMPACT ON THE ENVIRONMENT

Annotation*. Today, a number of results are being achieved in the agricultural sector of the Republic, including scientific and practical work aimed at improving the composition of the soil and saturating it with the nutrients it needs, as well as cleaning it from toxic elements. Heavy metals and radionuclides have a detrimental effect on plants, animals and the environment if any element is in excess concentration in the soil.*

Keywords. *Lead, nickel, chromium, cadmium, zinc, fluorine, soil, plants, animals, herbicides, pesticides*

Kirish. Litosfyera (litos-tosh, sfyera-shar, qobiq) deganda yerning 30-40 km. qalinlikdagi qattiq qobig‘i tushuniladi. Yer ustiva yer osti hozirda faol o‘zlashtirilgan. Hozirda litosfyerada Yer osti qazilmalari 10 km.gacha bo‘lgan chuqurliklardan olinishi mumkin. XXI asrga kelib insoniyat litosfyeraga mislsiz ta’sir ko’rsatmoqda. Shaharlar ostida yer osti shaharlari bunyod qilingan, chiqindixonalar, omborxonalar mavjuddir. Yer ostida yadro quroli sinovlari o‘tkaziladi. Litosfyera o‘z ichiga yer resurslarini, o‘simliklarini, o‘rmonlami, hayvonot olamini, yer osti boyliklarini kiritadi. Litosfyerani muhofaza qilish, uning boyliklaridan oqilona foydalanish: bu ishlab chiqarish jarayonlarining samaradorligini oshirish hamda insonning tabiiy yashash sharoitlarini, sayyorani genetik fondini saqlab qolishning asosiy omillaridan biridir.

Adabiyotlar sharhi. Ma’lumotlariga ko‘ra (Kramarev S.M. Zozulya O.A., 2000) yiliga dunyo bo‘yicha metallurgiya sanoati tomonidan tuproq qoplamiga 150 ming tonna mis, 120 ming tonna rux, 90 ming tonna qo‘rg‘oshin, 12 ming tonna nikel, 1,5 tonna molibden, 800 tonna kobalt tushadi. Ifloslanish manbalaridan chiqayotgan og‘ir metallar Biosferada quyidagi chizma ko‘rinishida aylanadi. Biroq tuproqda, inson organizmida, o‘simlik va hayvon tanasida har bir og‘ir metalning o‘ziga xos takrorlanmas funksiyasi mavjud, ya’ni har elementni tuproq uchun juda katta ahamiyati bor. Biroq me’yoridan oshishi tuproq olami va hossalari uchun salbiy ta’sir qiladi. Quyida ayrim og‘ir metallarning bir qator funksiyalari keltiriladi: Vanadiy azot fiksatsiyasi, oksidlanish-qaytarilishi va temir metabolizmi; Xrom-hayvon organizmlarida glyukoza miqdorini boshqarish; Marganes-oksidlanish-qaytarilish reaksiyalari, fotosintez, yog‘lar metabolizmi, polisaharidlar sintezi; Temir–kislorod metabolizmi, oksidaza, peroksidaza hosil bo‘lishi, gemoglobin va mioglobinda porfirin sintezi; Kobalt-V12 vitaminlari tarkibida va azot fiksatsiyasida; Nikel-ureaza fyermenti tarkibida, ribosoma, DNK va RNK strukturasining barqarorligida; Mis–xloroplast oksidlanish-qaytarilish reaksiyalarida, fenol birikmalari metabolizmida, pigmentlar hosil bo‘lishida; Rux -70 dan ortiq fermentlar faolligida va silikatlar o‘zlashtirilishida, nuklein kislotalar metabolizmida ishtirok etadi. Bundan ko‘rish mumkinki, og‘ir metallarning funksiyalari juda muhim bo‘lib, tiriklikning muvozanatida muhim rol o‘ynaydi. Metallurgiya faoliyati va tuproqqa kanalizatsiya loyini qo'shish bilan bir qatorda, zaharli birikmalarning tarqalishi, kislotalilik, sho‘rlanish va sodifikatsiya, tuproq yeroziyasining kuchayishi, kimyoviy o'g'itlar, pestitsidlar, fungitsidlar va to‘planishi kabi tuproq ifloslanishining bir qancha sabablari mavjud. og‘ir metallar va boshqa noorganik ifloslantiruvchi moddalar (Meyerschman va boshq. 2011).

Tuzning to‘planishi Tuzlarning, xususan, natriy (Na+), xlor (Cl) va bor (B)ning to‘planishi qurg‘oqchil va yarim qurg‘oqchil hududlarning sug‘oriladigan dehqonchiligida mavjud xavf hisoblanadi (Havlin va boshq. 2005).

Tuproq odatda atrof-muhitga tashlanadigan og‘ir metallar uchun so‘nggi cho‘kma hisoblanadi, ammo og‘ir metallarning tuproq bilan bog‘lanish usuli va

ularni chiqarish osonligi haqida nisbatan kam ma’lumot mavjud. Tuproqdagi og‘ir metallarning kontsentratsiyasiga antropogen metallar kirishiga qo‘shimcha ravishda ularning tuzilishi, tarkibi, qaytarilish/oksidlanish reaktsiyalari, adsorbsiya/desorbsiya va jismoniy tashish yoki saralashdagi o‘zgarishlar ta’sir ko‘rsatishi mumkin (Xanna va boshq. 2009).

Natija va muhokama. Tuproqni ifloslantiruvchi moddalarni nazorat qilish.

Tuproq qoplamini og‘ir metallar bilan ifloslanishini quyidagi asosiy manbalari mavjud:

1). Metal qayta ishlash sanoati chiqindilari;
2). Sanoat korxonalari
3). Yoqilg‘i mahsulotlari;
4). Avtomobillar tutuni;
5). Qishloq-xo‘jaligida qo‘llaniluvchi kimyoviy moddalar.

Tuproqni ifloslantiruvchi moddalarni nazorat qilishning ko‘plab aniq usullari mavjud, masalan, poligonlar, yonish va yoqish, kompostlash, qayta ishlash.

• Chiqindixonalar: qattiq chiqindilarni utilizatsiya qilish va ko‘rnish mumkin. Biroq, chiqindixonadan havo, tuproq va suvning keraksiz ifloslanishiga yo‘l qo‘ymaslik uchun ko‘pincha ehtiyotkorlik bilan tayyorgarlik ko‘rish va boshqarish talab etiladi.

• Yonish yoki yoqish: bu asosan qattiq chiqindilar hajmini kamaytirish uchun amalga oshiriladi. Ammo bu yerda og‘ir metallar va zaharli birikmalar kabi xavfli materiallarga ega bo‘lishi mumkin bo‘lgan havodagi zich ko‘l chiqindilarini ishlab chiqarmaslik uchun yaxshi rejalashtirilgan kuyish faoliyati talab qilinadi. O‘simliklar og‘ir metallarning ta’siriga chidash orqali ildizdan mikoriza hosil qiladi, ularning ildizdan kurtaklarga o‘tishini cheklaydi va metallarning metabolik jarayonlarga xalaqit byermasligi uchun o‘simlik ichida organik kislotalar bilan komplekslar hosil qiladi.

• Qayta ishlash, qazib olish va qayta foydalanish: mamlakatlar qattiq chiqindilarni qayta ishlash mexanizmini ishlab chiqishlari kerak, shunda materiallar chiqindilarni boshqarish strategiyalarining bir qismi sifatida turli sanoat tarmoqlarida xom-ashyo sifatida ishlatilishi mumkin. Qo‘shimcha mahsulotlar qishloq xo‘jaligida organik o‘g‘it sifatida ham qo‘llanilishi mumkin. Har bir mamlakat, ayniqsa rivojlangan mamlakatlar, qattiq chiqindilar tufayli ifloslanish sezilarli darajada kamayishi uchun butun dunyo bo‘ylab qayta ishlash dasturlarini kengaytirish uchun yordam olishlari kerak.

• Chiqindilarni oldini olish: qattiq chiqindilarni boshqarishda eng yaxshi amaliyot chiqindilarning oldini olish hisoblanadi. Tovarlar va tovarlarni ishlab chiqarish jarayonida resurslardan nojo‘ya foydalanishni muntazam ravishda kamaytirish, masalan, mahsulotlarni qayta ishlatishni osonlashtirish va atrof-muhitning ifloslanishi bilan bog‘liq yuqori xarajatlarni kamaytirish uchun ularni loyihalash yoki ishlab chiqarish usullarini o‘zgartirish kerak. Kimyoviy moddalar havo, suv va tuproqni ifloslantiradigan ko‘p yillar davom etadi.

• Kompostlash: organik chiqindilarni yoqish o‘rniga parchalanishi muhim tabiiy jarayonlardir. Kompost tabiiy o‘g‘it bo‘lib, qishloq xo‘jaligida bir qator afzalliklarga ega. Tuproqlarning gumus miqdori yuqori ta’minlangan bo‘lib, haydov (0-30 sm) qatlamda 3,891%, haydov osti tuproqlarda 2,647% ni tashkil etadi. Umumiy azot 0,308-0,044%, fosfor 0,317-0,628%, kaliy miqdori 1,28-2,75% oraliqda tebranib, uglerodni umumiy azotga bo‘lgan nisbati 6,43-7,328 ga teng. Harakatchan fosfor 32,25-31,86 mg/kg ni, pastki qatlamlar tomon 8,65-23,22 mg/kg, almashinuvchi kaliy 184-425 mg/kg, harakatchan fosfor miqdoriga ko‘ra, juda yuqori (45-60 mg/kg) va o‘rtacha (30-45 mg/kg), pastki qatlamlar tomon kam va juda kam (15-30 va <15 mg/kg) ta’minlangandir.

• Qonun va huquqiy me’yorlar: potentsial xavfli materiallarni suv havzalari va tuproqlarga tashlashni himoya qilish yoki cheklash uchun qonun qo‘llanilishi kerak. Qonun va nizomda xavfli materiallarni qanday qilib xavfsiz tashlash va ko‘rnib tashlash usullari ko‘rsatilishi kerak.

Xulosa. Xulosa qilib aytadigan bo‘lsak maksimal bog‘lanishga erishgandan so‘ng, xrom (VI) ionlari tuproqda uzoq vaqt - bir oy davomida qoladi. Bu shuni anglatadiki, sug‘orishdan sug‘orishgacha xrom (VI) ionlari tuproqda qolishi mumkin. Bu ekologik jihatdan juda xavfli jarayondir. Juda kuchli oksidlovchi moddalar sifatida ma’lum bo‘lgan erkin xrom (VI) ionlarining mavjudligi, birinchidan, chirindining qaytarilish qobiliyatiga ta’sir qiladi (u kamayadi), ikkinchidan, o‘simliklarda xrom ionlarining to‘planishiga yordam beradi, chunki xrom (VI)) ionlar o‘simliklarning ildiz tizimi orqali tezroq kirib boradi. Tuproq tarkibiga yangi moddaning kiritilishi ikkinchi bir moddaning tarkibini o‘zgartirishi barchaga ma’lum. Tuproq tarkibiga toksik elementlarning kiritilishi natijasida yuqori gumus miqdoriga ega bo‘lgan variant tuproqlarida stress jarayonning boshlaganligini ko‘rish mumkin.

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THE IMPORTANCE OF USING TABLE TENNIS IN DEVELOPING FLEXIBILITY AND PHYSICAL QUALITIES IN HIGHER EDUCATION STUDENTS

Annotation. *Physical education and sports play an important role in the comprehensive mental, moral and physical development of the growing younger generation, and the formation of feelings of courage, patriotism, loyalty and honesty in them is one of the urgent issues of today. The article discusses the importance of table tennis in the development of physical qualities in higher education students.*

Keywords: *physical quality, flexibility, agility, mental, physiological, psychological, table tennis, sports equipment*

At the initiative of the President of the Republic of Uzbekistan Sh.M. Mirziyoyev and under the leadership of our state, great attention is being paid to physical education and sports. In particular, the decrees and resolutions of June 3, 2017, No. PQ-3031 "On measures for the further development of physical education and mass sports", and March 5, 2018, No. PF-5368 "On measures to radically improve the state management system in the field of physical education and sports" focus on issues related to strengthening the health of the population of our country, increasing physical fitness, and forming a healthy lifestyle.

The President of the Republic of Uzbekistan Sh.M. Mirziyoyev named 2021 the "Year of Supporting Youth and Strengthening the Health of the Population". We all know that the role of physical education and sports in forming a healthy lifestyle in society and strengthening the health of the population is incomparable. It is an extremely important condition for the formation of the physical and spiritual health of the younger generation growing up in our country, instilling in them the desire for a healthy lifestyle and a love of sports.

The head of our state put forward 5 important initiatives to establish a new system of work in the social, spiritual and educational spheres. The second initiative is aimed at creating the necessary conditions for the physical training of young people and their ability to demonstrate their abilities in sports. Using the opportunities created in this way, we need to involve our young students in various areas of sports, depending on their interests, and prepare new champions from them. In this regard, I would like to cite the following thoughts of the head of our state, Shavkat Mirziyoyev, as an example: "There is no child without abilities in the world, our main task is to be able to see this ability, analyze it, improve it, and, based on the abilities of students, direct them to a profession or craft."

The benefits of physical education are numerous, helping young people grow into responsible adults who understand the importance of a healthy lifestyle.

On February 13, a videoconference meeting was held under the chairmanship of the President of the Republic of Uzbekistan, Chairman of the National Olympic Committee Shavkat Mirziyoyev on measures to bring the Olympic and Paralympic movement, specialized and mass sports to a new level, and increase the physical activity of the population.

The intention of every parent, every nation is to raise a physically and spiritually mature generation. And this cannot be achieved without physical education and sports. Sport is the pillar of a healthy nation and a healthy generation.

To form a healthy lifestyle in our society, to create conditions that meet the requirements of the time for the population, especially the younger generation, to regularly engage in physical education and mass sports, to develop in young people their will, strength, agility, and confidence in their capabilities through sports competitions, to cultivate feelings of courage and patriotism, and loyalty to the Motherland. Today, the game of table tennis is popular in all developed countries, and to educate the younger generation as spiritually mature and physically fit people.

In order to maintain and further improve their position in the international sports arena, coaches and athletes need to use in practice the results of the latest scientific developments in biomechanics, physiology and other disciplines related to the system of athlete training, and to systematically improve the system of developed training methods based on the generalization of the experience of the world's strongest tennis players. Table tennis is a very popular game all over the world, millions of people are engaged in table tennis.

Great art is needed to play table tennis well. Ease and speed of movements, speed of attacks and selflessness of defense, technical surprise and intelligence. Achieving high results is impossible without the comprehensive physical development of the athlete. This is done during training throughout the year, which is aimed at the consistent adaptation of the body to intensive loads and improving the moral qualities of the tennis player.

To develop muscle strength in tennis players, it is necessary to take into account the specifics of the game of table tennis, which requires agility, speed and endurance. Therefore, excessive passion for exercises that develop strength can deprive the player of elastic movements, the sharpness of the ball's feel. Exercises should be varied and develop all muscle groups. Exercises that develop strength should be alternated with exercises that help improve flexibility, elasticity and coordination of movements.

Speed allows a tennis player not only to avoid unnecessary movements, but also to increase the speed of the game. The speed of movement depends on the flexibility of the joints, the strength and elasticity of the muscles, the activity of the athlete's nerve centers, as well as his endurance, the perfection of sports technique and strong-willed qualities. The expediency and rationality of movements are of

particular importance for increasing speed. This is provided by the best start, work with throws, acceleration, as well as basketball games and special exercises.

Endurance is of great importance in table tennis. Often, players who do not have good equipment and endurance, having won the first games brilliantly, in the second half of the competition lose the accuracy of their blows, they lose concentration, normal breathing changes, they become restless and sweat.

Table tennis (ping pong) has many health benefits. It helps improve physical and mental health, as well as reducing stress and improving concentration.

Benefits of playing table tennis:

Physical benefits:

Table tennis strengthens the cardiovascular system, tones muscles, and increases mobility. It is a light exercise that is suitable for people of all ages.

Mental benefits:Table tennis helps develop concentration, quick decision-making, and hand-eye coordination. Speed and strategic thinking are important during the game, which activates mental activity.

Social benefits:Table tennis is a good tool for playing with friends and family. It facilitates communication and improves team spirit.

Stress reduction: Table tennis training helps reduce stress. During the game, the body releases endorphins, which can improve mood and relieve stress.

Concentration: Playing table tennis requires focus and concentration. This ability is also important in performing tasks in everyday life.

Most of these skills are easy, fast and perform various movements quickly and using game techniques, using technical styles and methods of the game. The tennis player must have his body in order to perform a series of strokes from different positions. This flow of complex technical methods of the game requires economical savings.

Three periods are known in the tactics of the development of table tennis. The first is the probiotic of tactical methods, but was distinguished by a long-term pie of the ball; The second is tactical, but was built separately for one Udrota or left and cutting the defense; The third is the modern period, but is based on the ability to use various well-developed techniques in the game of drainage and counterattack.

Thus, in modern offensive tennis, active attack and counterattack tactics, combined with short-term active defense, are an auxiliary tool for winning. Tactics require tennis players to clearly organize their actions in a competition, implementing a special tactical plan. It is useful to analyze the techniques of their opponents in detail by drawing up a tactical plan. The plan should be simple and clear. It should take into account not only the general tasks of tactics, but also the ways to score a goal. It is necessary to create such conditions in the game that, using its strengths to the fullest, it will weaken the opponent, if possible. It is important to stop unexpected moves that are not the most dangerous for the opponent. In table tennis, the stylistic features of the technique play an important role, requiring a variety of tactical options. Regular training of a previously developed tactical plan increases the level of the tennis player's game in sports.

In conclusion, table tennis serves to strengthen human health. It develops agility, eye-sight, quick thinking in a person, that is, all the qualities that are needed in everyday life. Its attractiveness lies in the fact that people of different ages have the opportunity to compete for victory in this sport, and the youngest or strongest do not always win, much attention is paid to skill, agility and coordination. Table tennis is a great way to spend an active time for everyone who prefers serious training and who picked up a racket for the first time in their life.

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HUDUDLARNI RIVOJLANTIRISH UCHUN GEOFAZOVIY TEXNOLOGIYALARNI QO‘LLASH

Annotatsiya: *Maqolada hozirgi kunda geofazoviy ma’lumotlar orqali xavodan va sun’iy yo‘ldoshlar yordamida fazoviy usullardan foydalanib amalga oshirilmoqda. SHuningdek, masofadan zondlashda nafaqat fotoplyonkalar, balki raqamli fotoapparatlar, skanerlar, videolar, radar va termal sensorlar ishlatilmoqda. Utgan zamonlarda esa masofadan zondlash elektromagnit spektrning ko‘rinuvchi qismini ishlatish imkoniyati bilan cheklangan, spektrning inson ko‘ziga ko‘rinmaydigan qismi xozirgi kunda spektral filtrlar, fotoplyonkalar va boshqa turdagi sensorlar yordamida ishlatilishi mumkin.*
Kalit so‘zlari: *GLONASS, distansion zondlash, GIS, 3D relyef, geoaxborot.*

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APPLICATION OF GEOSPASTIC TECHNOLOGIES FOR REGIONAL DEVELOPMENT.

Abstract: *The article is currently carried out by spatial methods using geospatial data from the air and satellites. Also, remote sensing uses not only photographic films, but also digital cameras, scanners, video, radar and thermal imaging sensors. If earlier remote sensing was limited to using the visible part of the electromagnetic spectrum, then the part of the spectrum invisible to the human eye can today be used with the help of spectral filters, photographic films and other types of sensors.*
Key words: *GLONASS, remote sensing, GIS, 3D relief, geoinformation.*

Kirish.

Bugungi kunga kelib geofazoviy texnologiyalar haydovchilarga, piyodalarga sun’iy yo‘ldoshlar bilan aloqa qilgan holda geofazoviy ma’lumotlar o‘rni to‘g‘risidagi ma’lumotlarni qayta ishlash orqali turli marshrutlarni navigatsiya qilishda, eng yaqin, eng qulay yo‘llarni izlab topishda qulaylik tug‘dirmoqda. Bir qarashda oddiy uyali telefonimiz orqali bunday ma’lumotlarni kartada bemalol olishimiz oson ko‘rinadi, ammo bu qulaylik ortida geoaxborot tizimi qonunqoidalarini to‘g‘ri qo‘llash kabi ishlar ko‘lami yotadi. Agar geoaxborot tizimini bundan 10 yillar oldin faqatgina aniq bir mutaxassislar guruhigina ishlatishi mumkin, degan qoidalar mavjud bo‘lgan bo‘lsa, bugungi kunga kelib internet tarmog‘idagi veb-portallar, turli navigatsiya tizimlari, uyali telefonlardagi

dasturlarning ishlab chiqilishi oddiy fuqaroning ham ushbu sohani bilishiga asos yaratdi. Geoaxborot tizimi kartografiya va masofadan zondlash, fotogrammetriya va topografiya bilan chambarchas bog‘liq hamda matematik, kartografik, masofadan zondlashda qo‘llaniladigan usullar bilan bir qatorda yer qatlami geologiyasi, tuproqshunoslik, o‘rmonchilik, geografiya, iqtisodiyot, biologiya kabi fanlarni o‘zaro birlashtiradi [3].

Geoaxborot tizimidagi dasturlarda ma’lumot jadvalda keltirilishi mumkin. Ma’lumot qayta ishlanib, tahlil etilganidan so‘ng u axborotga aylanadi. Ma’lumotni o‘qiganda biz faqat sonlarni ko‘rsak, axborotda ma’lumotlar tartibli ko‘rinishga keltiriladi va aynan shu ma’lumotni ko‘rmasakda, ular asosida qayta ishlangan natijani ko‘rishimiz mumkin bo‘ladi. Tushunarli bo‘lishi uchun soddaroq misol sifatida talabalarning imtihon natijalarini keltirishimiz mumkin. Agar har bir talabaning imtihon natijasi ma’lumot hisoblansa, u holda auditoriyadagi yoki umuman institutdagi talabalarning o‘rtacha bahosi, o‘zlashtirish ko‘rsatkichi axborot deb ataladi.

Tadqiqot natijasi

Geofazoviy ma’lumotlar “geospatial data” deb yuritiladi va u geografik va fazoviy ma’lumotlar tushunchalarining yig‘indisidan tashkil topgan bo‘lib, fazoviy ma’lumotlar bilan bir xil tushuniladi. AQSH ning Geologik tadqiqot agentligi bergan ta’rifga ko‘ra, bu ikkala tushunchani bir xil ma’noda tushunish ma’qul hisoblanadi va ular bir-birining o‘rnida qo‘llaniladi. Geofazoviy ma’lumotlar odatda koordinatalar, topologiyalar ko‘rinishida saqlanadi va ular asosida kartalar ishlab chiqiladi. Bu tushuncha asosan geoaxborot tizimida qo‘llaniladi va olishga, boshqarishga hamda tahlil etishga mo‘ljallangan bo‘ladi. Geofazoviy ma’lumotlar geoaxborot tizimini boshqa axborot tizimlaridan ajratib turadi. Geofazoviy ma’lumotlar, o‘z navbatida, tizimda ikki turga bo‘linadi, ya’ni vektor va rastr ma’lumotlar.

Rivojlanayotgan axborot jamiyatining asosiy xususiyatlaridan biri axborotni eng muhim strategik boshqaruvga aylantirish muhim resurslaridan biridir [2]. Har xil turdagi geofazoviy ma'lumotlar orasida boshqaruv faoliyatini ta'minlashda axborot alohida o'rin egallaydi. Ushbu ma'lumotlar masofaviy zondlash natijalaridir. Yer elektromagnit spektrning turli diapazonlarida (ko‘rinadigan, infraqizil nurlar, santimetr); ishlaydigan radiodan ro‘yxatga olingan radio emissiyalari elektron vositalar, sun‘iy yo'ldosh orqali uzatiladigan radio signallari oqimlari aloqa tizimlari; global navigatsiya tizimlaridan navigatsiya signallari (masalan,GLONASS).

Sun’iy yo'ldosh tasvirlarining barcha to‘plami orasida [4] mavjud: oq-qora, yarim-butun ko‘rinadigan qismga sezgir bo‘lgan tasvirni qabul qilgichdan olingan spektr yoki uning alohida bo‘limlari; rangli (uch o‘lchamli), tasvirlarni berish tabiiy rang berish bilan; spektral (multispektral, giper-spektral), spektrning ma’lum qismlariga sezgir bo‘lib, beradi shartli ranglardagi uyg‘unlashgan tasvirlar; radiolokatsiyalardan foydalanish yer yuzasi va antropogen xususiyatlarini aks ettiruvchi elektromagnit spektrning radio (santimetr) diapazonidagi ob‘yektlardir.

Kosmik tasvirlarning asosiy xususiyatlari:

• yuqori axborot sig‘imi - rasmiy sifatida, qayta ishlab chiqarilgan elementlar soni (30x30 sm o‘lchamdagi har bir kvadrat uchun taxminan 10 10 juft birlik) yorqinligi gradatsiyalari soni m = 16 va o'lchamlari R = 50 satr bilan 1 mm uchun) va mazmunli, turli xil xususiyatlar bilan belgilanadi ob’yektlar va ob’yektlar o‘rtasidagi munosabatlardagi ma’lumotlarning miqdori;

• rejalashtirilgan tasvirdagi nuqtalar joylashuvining geometrik aniqligi, nuqtalarning koordinatalarini aniq o‘lchashga imkon beradi va boshqa o‘lchovlarni amalga oshirish uchun: chiziqli, maydonli, baland va burchakli o‘lchamlar;

• qo‘shimcha parametrlardan faol foydalanish (rang, to‘yinganlik zichlik, yorug‘lik, rang uyg‘unligi) jamlanmasini sezilarli darajada oshiradi, deshifrlash belgilari va boshqa belgilarga ko‘pincha indikator rolini bajaradi;

• murakkab deshifrlangan xususiyatlardan foydalanish - fazoviy tasvirlarning rang tuzilishi;

• ob’yektlarning qo‘shimcha harorat xususiyatlarini o‘tkazish imkoniyati va tunda tasvirlarni olish imkoniyati (infraqizil tasvirlar uchun);

• geoaxborot ma’lumotlarining yagona bankini shakllantirish, shu jumladan yaratish, hududlarni vizual ko‘rish imkonini beruvchi 3D relyef modellari ob’yektlarni qurish, kommunikatsiya infratuzilmasini sifatli loyihalash, ko‘rinish hududini, signalni qamrab olish hududini kuzatishni hisobga olgan holda tuzilmalar yaratish va h.k.;

• xaritalash, shu jumladan yaratish (qo'shimcha ma'lumotlarni jalb qilgan holda) va butun masshtab diapazonidagi topografik xaritalarni yangilash (1:2000 dan 1:1000 000 gacha), kadastr planlarini yangilash, tematik xaritalarni yaratish - qanday qilib tabiiy resurs va ijtimoiy-iqtisodiy va boshqalarni xaritalash;

• shahar iqtisodiyoti monitoringi (shahar qurilishi chegaralarini aniqlashtirish, shahar transport infratuzilmasini monitoring qilish, rejalashtirish va nazorat qilish shahar qurilishi, shaharning rekreatsion hududlari holatini monitoring qilish; qattiq maishiy chiqindilar poligonlari va poligonlari holatini nazorat qilish, aniqlash ruxsat etilmagan chiqindilarni olib tashlash va boshqalar [2].

Xulosa

Shunday qilib, tartibga soluvchi normativ-huquqiy hujjatlarni birlashtirish manfaatlarini ko‘zlab, kosmik faoliyat natijalarini qo‘llash tartibini belgilab beradi hududlarni ijtimoiy-iqtisodiy rivojlantirish va boshqarmalarning faoliyati kosmik axborotni to‘plash va qayta ishlash quyidagilarga imkon beradi: birinchidan, 2030 yilgacha bo‘lgan davr mobaynida Respublikamiz mintaqalarida davlat siyosatining asoslarini amalga oshirish bo'yicha yagona siyosat manfaatlari yo'lida geofazoviy faoliyat natijalaridan foydalangan holda iqtisodiyotini modernizatsiya qilish va uning mintaqalarini rivojlantirish; ikkinchidan, mintaqaviy hokimiyat va boshqa manfaatdor tomonlar va iste’molchilarni ma’lumotlar bilan o‘z vaqtida va to‘liq ta’minlash; uchinchidan, potentsial imkoniyatlarni amalga oshirish darajasini oshirish, ijtimoiy-iqtisodiy faoliyatning barcha sohalarida geofazoviy ma’lumotlar bilan ta’minlangan mintaqalar yaratish maqsadga muvofiqdir.

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WASTE PRODUCED IN THE PRODUCTION OF CHEMICAL ADDITIVES FOR PAINT PIGMENTS

Abstract: *The article provides information on hazardous waste generated during the production of chemical compounds required for the production of paints for light industry.*

Key words:*Light industry, paint, ester, reactor, plasticizer, titanium oxide, plasticizer.*

A complex ether (reactor) is used as a chemical additive to obtain light industrial paints. The following products are needed for the preparation of complex ether (reactor). Ethoxylate alcohol 8%, alkanesulfonates 7%, sulfosuccinates 9%, LABSA 4%, phosphonates 7.5%, copolymer acrylic and minor ionic acid 9%, homopolymer acrylic acids 7%, gluconates 6%, DTMRT 5%, oil 6%, amine ethoxylates 8%, naphthalene sulfonate 6%, organic acid and their salts 13%, acid complex fatty ether, siloxanes and silicones, ammonium salt, copolymer acrylic 4.5%. The above mixtures are mixed in universal reactors. The production capacity of complex ether for one day is 1500 kg/day. The annual capacity is as follows:

K = 10000 * 300 *0,8 = 2400 t/year

In the preparation of the compound ether, the pigments are mixed in a mixer at 1450 rpm until a single mass is formed. After the mixture reaches a uniform mass, it is sent to the pearl mill for dispersing the pigment paste. Then the mixture and solvents are added to the mixer and mixed until a mass is formed [1-3].

During the preparation of compound ether (reactor), acetone, benzene, butyl acetate, hydrocarbon, amyl acetate, propanol, xylene, methanol, ethyl acetate, ethylbenzene are released into the atmosphere. Pollutants are released into the atmosphere with the help of a ventilation pipe and cleaning equipment.

Chemicals needed to prepare 15% emollient mixture and bleach: isopropyl alcohol, monoethylene glycol, butyl diglycol ethyl, silicate oils, hydrogenated corn oil, acetaldehyde, emulsifiers, hydrogen peroxide, glycerin, ethoxyl alcohols, paraffin, polyethylene, aminoethylene, ethanol amine, diethanol amine, chlorine ammonium, phosphates, ammonium sulfate, formaldehyde.

To prepare the softener mixture and bleach, the above additives are mixed in a mixing pot with a specified percentage in a pot with a capacity of 3 tons/day. An annual capacity of 600 tons of softener and 1800 tons of bleaching products is produced.

As the prepared product is hot, it is cooled using a cooling compressor. A steam and oil generator, a cooling network of a cooling tower, a water ionization

production network, a compressor, and a generator are used in the technological process.

Pollutants formed in these processes are discharged into the atmosphere through the purification equipment of butyl acetate, butyl alcohol, ethyl alcohol, and toluene.

Chemicals used in the preparation of detergents: acrylic, hydroxide, ethoxyl alcohols,phosphonates, ammonium sulfate, labsa, butyl diglycol, isopropyl alcohol, polyethylene glycol, sulfuric acid, phosphoric acid, magnesium chloride, carbonate, hydrogen peroxide, sulfates.These compounds are mixed in the specified amount in the mixing pot. Washing products 2300 kg/day, annual amount 1382 t/year.

The preparation of washing products consists of a suspension of aqueous emulsion paints with pigments, fillers and water-dispersed film-forming substances, a mixture of emulsifiers, dispersants and other auxiliary additives. It is planned to install 3 complete sets of emulsion production equipment manufactured in Turkey for the production of washing products.

The following are installed in the laboratory. Drying cabinet, pH meter, conductometer, laboratory stirrer, dyeing machine, F350 Ataç Fulad, color cabinet, suction cabinet, Heat resistance testing device, measuring equipment.

Raw material products, which need to prepare a complex ether (reactor) for the reaction of the product, are brought to the enterprise ready-made.

The properties of paint products vary depending on the quantity and quality of the components.

The paint consists of a suspension of titanium dioxide and other apigmen, a filler mixed with pentatalum varnish. The table below shows the composition % of raw materials used for the production of PF type oil paint.

Products used for the production of PF type oil paint

1.Table

Substance name	White color	The air is colored	Gray color	Red color
Half-finished pentaphthalate varnish	28	26	20	85,3
Titanium dioxide	62	60	75	-
Zinc alloy	-	6	-	-
Technical carbon	-	-	0,5	
Iron azure	-	4	-	
Red pigment	-	-	-	10,7
Total: %	100	100	100	100

A total of 500 tons of oil paint is produced in the paint production workshop in one year. If this amount of oil paint is conditionally produced in 4 different colors, 125 tons of each color will be produced. Taking these into account, the consumption of raw materials will be as follows.

Raw materials for paint production

2.Table

Substance name	White color, 125 t	The air is colored, 125 t	Gray color, 125 t	Brown in color, 125 t	Total, kg
Half-finished pentaphthalate varnish, kg	3500	3250	2500	10662,5	19912,5
Titanium dioxide, kg	7750	7500	9375	-	24625
Zinc alloy, kg	-	750	-	-	750
Technical carbon, kg	-	-	62,5		62,5
Iron azure, kg	-	500	-		500
Red pigment, kg	-	-	-	1337,5	1337,5

These raw materials are brought to the enterprise ready. Raw materials are not produced on the territory of the enterprise.

In the preparation of the compound ether, the pigments are mixed in a mixer at 1450 ob/min until a single mass is formed. After the mixture reaches a uniform mass, it is sent to the pearl mill for dispersing the pigment paste. Then add driers and solvents to the mixer and mix until various masses are formed.

The complex ether is used for painting metal and wooden products inside and outside. It is often used as a finishing material in construction.

As a result of the preparation of complex ether in the workshop, it is observed that harmful substances such as Acetone, Benzene, Butylacetate, Hydrocarbon, Amylacetate, Propanol, Xylene, Methanol, Ethylacetate, Ethylbenzene are released into the atmosphere through the ventilation chimney.

Production of bleaching washing products: aqueous emulsion paints consist of a suspension of pigments, fillers and water-dispersed film-forming substances, a

mixture of emulsifier, dispersant and other auxiliary additives. It is planned to install 3 complete sets of emulsion production equipment manufactured in Turkey for the production of washing products.

By use, washing products are produced for light industry products.

Whitening detergents contain a film-forming substance, pigments, fillers, water, auxiliary functional substances (dispersant, emulsifier, stabilizer, thickener, anti-foaming agent (penogasitel), antiseptic, corrosion inhibitors) and additives (hydrophobic, structuring, coalescing, etc.) are included.

Pigments and fillers - inorganic pigments consist of anatase and rutile titanium dioxide, lithopone, strontium and lead crowns, ultramarine, chromium oxide, metal oxides.

Materials such as lead, zinc, iron lazuli are not used during production. It is not intended to use these substances because they are toxic, can damage alkalis, and release iron oxide.

40% of the composition of the emulsion is water. Because the film-forming substance also contains water. Water is also added to bring the aqueous emulsion to the required liquid. For the production of aqueous emulsion, it is recommended to use condensed, distilled or demineralized water. To reduce the water hardness, it is passed between two sodium cation filters and the hardness is brought to 3 meq/l. The process of reducing water hardness lasts for 1.5-2 hours.

Auxiliary substances and additives - dispersants for auxiliary substances (this substance softens pigments and additives, serves to mix them well in a liquid environment), protective colloid (polyvinyl alcohol serves as a protective colloid, this alcohol makes polyvinyl acetate coatings water-soluble 'serves to reduce conductivity'), emulsifiers (emulsifiers include fatty acid salts and highly active substances.

These substances serve to improve film formation in aqueous emulsions), stabilizers, thickeners, antiseptics, antifoaming agents, structuring agents, corrosion inhibitors, antifreezes.

During these processes, butyl acetate, butyl alcohol, ethyl alcohol, and toluene are released into the environment.

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UZBEKISTAN'S ECONOMIC PROBLEMS AND SOLUTIONS

Annotation: *The Republic of Uzbekistan, situated at the crossroads of Central Asia, has made significant strides in its economic development in recent years. However, like many developing nations, Uzbekistan faces several challenges that hinder its progress and require strategic solutions for sustainable growth. In this article, we delve into some of the key problems affecting the country's economic development and explore potential avenues for addressing them.*

Keywords*: Diversification, business environment, human capital, regional cooperation, structural dependence.*

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O‘ZBEKISTONNING IQTISODIY MUAMMOLARI VA YECHIMLARI.

Annotatsiya**:** *O‘zbekiston Respublikasi, Markaziy Osiyoning chorrahasida joylashgan bo‘lib, so‘nggi yillarda iqtisodiy rivojlanishda sezilarli yutuqlarga erishdi. Biroq, ko‘plab rivojlanayotgan mamlakatlar singari, O‘zbekiston ham uning taraqqiyotiga to‘sqinlik qiluvchi bir qator muammolarga duch kelmoqda va barqaror o‘sish uchun strategik yechimlar talab qiladi. Ushbu maqolada mamlakatning iqtisodiy rivojlanishiga ta’sir qiluvchi ba’zi muhim muammolar chuqur tahlil qilinadi va ularni hal qilishning mumkin bo‘lgan yo‘llari ko‘rib chiqiladi.*

Kalit so‘zlar: *Diversifikatsiya, biznes muhiti, inson kapitali, mintaqaviy hamkorlik, tuzilmaviy qaramlik.*

The Republic of Uzbekistan, situated at the crossroads of Central Asia, has made significant strides in its economic development in recent years. However, like many developing nations, Uzbekistan faces several challenges that hinder its progress and require strategic solutions for sustainable growth. In this article, we delve into some of the key problems affecting the country's economic development and explore potential avenues for addressing them.

Structural Dependence on Natural Resources:

One of the primary challenges facing Uzbekistan's economy is its structural dependence on natural resources, particularly cotton and gold. While these

resources have historically contributed to the country's export revenue, over-reliance on them can lead to economic instability, especially given the volatility of commodity prices in global markets. Diversifying the economy to reduce dependence on a few key sectors is essential for long-term sustainability.

Diversification of Economy:

One of the primary challenges for Uzbekistan is the overreliance on a few key sectors, notably cotton production and natural gas exports. This lack of diversification makes the economy vulnerable to external shocks, such as fluctuations in commodity prices. To address this, Uzbekistan must focus on diversifying its economic base by promoting sectors like manufacturing, tourism, IT services, and agriculture beyond cotton.

Improving Business Environment:

Despite recent reforms to attract foreign investment and improve the ease of doing business, Uzbekistan still faces challenges related to bureaucracy, corruption, and regulatory barriers. Streamlining administrative processes, enhancing transparency, and strengthening the rule of law are crucial steps to foster a more conducive business environment that encourages both domestic and foreign investment.

Infrastructure Development:

Infrastructure gaps, particularly in transportation, energy, and telecommunications, pose significant hurdles to economic growth. Investing in modern infrastructure not only facilitates trade and connectivity but also enhances productivity and attracts investment. Projects such as the development of transport corridors and renewable energy initiatives can play a pivotal role in addressing these challenges.

Human Capital Development:

The quality of human capital is a key determinant of economic success. Uzbekistan needs to prioritize education and skill development initiatives to equip its workforce with the necessary capabilities for a modern and competitive economy. Emphasizing vocational training, STEM education, and lifelong learning can bridge skill gaps and enhance employment opportunities.

Skills Mismatch and Unemployment:

A skills mismatch between the education system and the demands of the labor market contributes to high unemployment rates, particularly among youth. Many graduates lack the skills and training needed for available job opportunities, leading to underemployment or migration in search of work. Investing in vocational training, promoting entrepreneurship, and aligning education with industry needs can help reduce unemployment and enhance productivity.

Informal Economy and Corruption:

The prevalence of an informal economy and corruption presents significant obstacles to Uzbekistan's economic development. Informal economic activities often evade taxation and regulation, reducing government revenue and undermining fair competition. Additionally, corruption erodes trust in institutions, discourages investment, and distorts resource allocation. Implementing effective anti-corruption

measures and promoting transparency can help formalize the economy and improve governance.

Financial Sector Reforms:

A robust and efficient financial sector is essential for mobilizing savings, allocating capital efficiently, and facilitating investment. Uzbekistan has been undertaking reforms to modernize its banking sector, improve access to finance for SMEs, and enhance financial literacy. Continued efforts in this direction, coupled with regulatory frameworks that promote stability and innovation, are vital for economic development.

Sustainable Development and Environmental Protection:

As Uzbekistan pursues economic growth, it must also prioritize sustainability and environmental protection. Addressing issues such as water management, land degradation, and air quality not only preserves natural resources but also contributes to long-term economic resilience and social well-being.

Regional Cooperation and Global Integration:

Enhancing regional cooperation through initiatives such as the Central Asia Regional Economic Cooperation (CAREC) and deepening ties with neighboring countries can unlock new trade opportunities, infrastructure projects, and investment flows. Furthermore, greater integration into global value chains and participation in international trade agreements can expand market access and boost export competitiveness.

Improving the Investment Climate:

- Simplify the tax system and introduce tax incentives for businesses.
- Implement effective anti-corruption measures and ensure transparent governance.
- Create favorable conditions for foreign investors, such as establishing free economic zones.

Supporting Small and Medium Enterprises (SMEs):

- Provide affordable loans and grants for SMEs.
- Establish incubators and accelerators to support startups.
- Organize training programs on entrepreneurship and business management.

Developing Infrastructure:

- Modernize transportation networks (roads, railways, ports) and energy infrastructure.
- Expand digital infrastructure and improve internet access.
- Reduce the infrastructure gap between urban and rural areas.

Promoting Education and Innovation:

- Align the education system with labor market demands, strengthening vocational training.
- Invest in research and development (R&D) to foster innovation and technological advancement.
- Encourage collaboration between universities, research institutions, and the private sector.

Diversifying the Economy:

- Reduce dependence on a single sector (e.g., natural resources) by promoting industries like agriculture, manufacturing, or tourism.
- Support the development of high-value-added industries, such as technology and renewable energy.

Enhancing Financial Inclusion:

- Expand access to banking and financial services, especially in underserved areas.
- Promote digital payment systems and financial literacy programs.
- Encourage microfinance initiatives to support small-scale entrepreneurs.

Strengthening Regional and Global Integration:

- Pursue trade agreements and partnerships to access new markets.
- Participate in regional economic initiatives to attract investment and share best practices.
- Improve logistics and customs processes to facilitate exports.

Addressing Unemployment and Inequality:

- Create job opportunities through public-private partnerships and infrastructure projects.
- Implement social programs to reduce poverty and income inequality.
- Support marginalized groups, including women and youth, through targeted economic policies.

CONCLUSIONS

In conclusion, while Uzbekistan has made commendable progress in its economic development journey, addressing the aforementioned challenges is crucial for sustained and inclusive growth. A comprehensive approach that combines policy reforms, infrastructure investments, human capital development, and environmental stewardship is essential to unlock Uzbekistan's full economic potential and improve the well-being of its citizens.

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THE IMAGE OF A CHILD BETWEEN FANTASY AND REALISM (THE IMAGE OF A CHILD IN THE WORKS OF ANDREEV AND DICKENS WITH REALISM AND METAPHORICAL METHODS)

Abstract. *The child image in literature often serves as a reflection of society, morality, and the human condition. Charles Dickens and Leonid Andreev, two prominent writers from different cultural and historical backgrounds, used the figure of the child both realistically and metaphorically. This article explores how each author balances fantasy and realism in portraying children, uncovering deep social commentary and existential questions through the dual lens of concrete description and symbolic meaning.*

Key words: *child image, fantasy, realism, metaphor, Charles Dickens, Leonid Andreev, social critique, psychological depth, existentialism, literary symbolism, Victorian literature, Russian literature, childhood, morality, vulnerability.*

Introduction. The literary image of the child has long carried significant emotional and ideological weight. In the hands of Charles Dickens and Leonid Andreev, the child becomes more than a mere character—it becomes a symbol of societal critique, human vulnerability, and philosophical inquiry. While Dickens is often celebrated for his social realism and advocacy for child welfare, Andreev is known for his psychological depth and existential metaphors. This article compares their portrayals of children, showing how fantasy and realism intertwine to construct a compelling literary image.

Realism and the Social Child in Dickens. Charles Dickens' depiction of children is rooted in Victorian England's harsh social realities. Characters like Oliver Twist, David Copperfield, and Little Nell emerge from a world of poverty, neglect, and injustice. These child figures are realistic in their depiction: they suffer hunger, cruelty, and abandonment. However, Dickens often uses these realistic depictions to evoke sympathy and advocate reform. The emotional appeal of his narratives depends on a naturalistic portrayal of childhood hardship. At the same time, Dickens imbues his child characters with resilience and moral purity, turning them into symbols of hope in a corrupted world.

The Metaphorical and Existential Child in Andreev. In contrast, Leonid Andreev's children inhabit a darker, more symbolic space. While grounded in Russian realist tradition, Andreev moves toward psychological and philosophical explorations. In works like *The Seven Who Were Hanged* or *The Red Laugh*, child figures may not always appear as main characters, but their presence—or absence—

serves as a powerful metaphor for lost innocence, human suffering, and existential despair. His children are often silent witnesses or tragic victims in a world that seems chaotic and indifferent, reflecting the broader anxieties of pre-revolutionary Russia.

Fantasy as Contrast and Commentary. Both authors utilize elements of fantasy or metaphor to deepen their messages. Dickens, for instance, often introduces dreamlike or grotesque figures (e.g., Fagin, Miss Havisham) that heighten the reader's emotional response to the child's struggle. His use of exaggeration and sentimentality serves a purpose: to reveal truths about injustice through a slightly distorted lens. Andreev, meanwhile, delves into nightmarish and surreal imagery, particularly in his later works. This fantastical approach highlights the irrationality and fragility of human existence. For him, the child becomes a symbol—not of hope—but of existential tragedy and the collapse of meaning.

While Dickens portrays the child as a beacon of purity, Andreev often presents the child as a helpless being caught in an absurd universe. This stark contrast underscores the difference in their worldview. Dickens' optimism and belief in reform is mirrored in the redemptive journeys of his child characters. Andreev, however, reflects the growing philosophical pessimism of early 20th-century Russian literature, where the child represents vulnerability in a chaotic and unredeemable world.

Conclusion. The image of the child in the works of Charles Dickens and Leonid Andreev demonstrates the rich potential of literary characters to serve both as realistic depictions and metaphorical constructs. Through the lens of realism, both authors critique their respective societies, shedding light on the suffering of children. Through metaphor and fantasy, they elevate these characters to symbols of broader human concerns—hope, despair, morality, and the search for meaning. Together, Dickens and Andreev offer a complex and layered portrayal of childhood that continues to resonate with readers and scholars alike.

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THE ROLE OF MULTIMEDIA RESOURCES IN DEVELOPING THE EDUCATION OF ELEGANCE IN FOREIGN LANGUAGE TEACHERS

Abstract. *In the context of modern, technology-enriched education, the training of foreign language teachers increasingly involves not only linguistic and pedagogical preparation but also the development of cultural, aesthetic, and emotional competencies. One such aspect is the education of elegance—a concept that encompasses refined communication, cultural sensitivity, esthetic perception, and ethical behavior. This article explores how multimedia resources—ranging from visual arts and music to digital storytelling and virtual museum tours—can play a transformative role in cultivating aesthetic and emotional intelligence in future foreign language educators.*

Keywords: *foreign language teachers, multimedia resources, education of elegance, cultural sensitivity, aesthetic development, digital pedagogy, teacher training, emotional intelligence, artistic perception, intercultural communication.*

Introduction. With the global integration of education and culture, the role of foreign language teachers extends beyond language instruction to include the transmission of cultural and ethical values. One important but often overlooked area is the *education of elegance*—an umbrella term for the cultivation of aesthetic taste, interpersonal grace, emotional sensitivity, and refined thinking. In an era where digital tools dominate the classroom environment, multimedia resources offer powerful avenues to instill these qualities in future teachers. They not only make abstract concepts more tangible but also create immersive learning environments where beauty, harmony, and cultural richness can be experienced directly.

Main part. The education of elegance involves more than external refinement. In teacher education, it refers to the internalization of qualities such as empathy, sensitivity to cultural nuance, appreciation for artistic forms, and respect for moral-aesthetic values. For future foreign language teachers, this means being able to integrate language learning with cultural depth and humanistic values, fostering well-rounded global citizens in the classroom. The **education of elegance** transcends mere outward refinement or aesthetic presentation; it encompasses a complex system of internalized values and sensibilities that are crucial for developing culturally competent and ethically grounded educators. In the context of **teacher education**, especially for **future foreign language instructors**, elegance must be understood as a synthesis of **emotional intelligence**, **cultural awareness,** and **aesthetic responsiveness**. For foreign language teachers, these qualities are not supplementary, but central. Language is not merely a system of grammar and vocabulary; it is a carrier of worldviews, traditions, and artistic expression. As such, teaching a foreign language necessitates engaging students with the deeper layers

of culture, where elegance serves both as a pedagogical orientation and a personal disposition.

By fostering the education of elegance, teacher preparation programs aim to develop professionals who are not only linguistically competent but also emotionally and ethically sensitive. Such educators are better equipped to create humanistic, inclusive, and globally aware classrooms, capable of nurturing learners' intercultural competence and holistic development.

Multimedia resources such as films, music, podcasts, digital art, virtual museum tours, and interactive applications provide multisensory engagement with diverse cultural products. For foreign language teacher education, these tools:

- Introduce students to the cultural aesthetics of the target language,
- Support emotional and visual literacy,
- Foster interpretive thinking and appreciation for diversity,
- Encourage reflection on beauty, ethics, and style in communication.

For example, watching foreign-language films or analyzing artworks from different cultures can provide insight into emotional tone, historical context, and expressive traditions, all of which support elegant, culturally informed teaching practices.

Virtual museum visits, classical music performances, poetry readings, and digital exhibitions are accessible ways for students to experience and analyze cultural products. These experiences deepen students' sensitivity to form, expression, and symbolism, which are crucial for refined pedagogical interaction. By engaging in reflective activities—such as interpreting symbolic meaning in an artwork or describing emotional nuances in music—students develop a more elegant and thoughtful communicative style.

Multimedia can be integrated into teacher training programs through:

- **Digital storytelling** projects that combine narration, visuals, and music to express complex emotional or cultural themes;
- **Film-based discussions** on social norms, politeness strategies, or artistic styles in the target culture;
- **Virtual field trips** to art galleries or heritage sites with reflective writing tasks;
- **Music analysis** to explore cultural identity, metaphor, and emotion in song lyrics;
- **Interactive drama and simulation games** to develop empathy and grace in classroom communication.

Such activities help develop not only linguistic competence but also intercultural sensitivity and elegant teaching behavior.

While multimedia tools are promising, their effective use requires methodological awareness. Instructors must ensure that activities are purposeful, reflective, and aligned with pedagogical goals. Elegance cannot be "taught" directly; it must be cultivated through experience, modeling, and critical engagement with meaningful content.

Moreover, access to quality multimedia and appropriate technological training are crucial for both instructors and students. Careful selection of culturally authentic and ethically sound materials is essential to ensure the educational value of such resources.

Conclusion. The integration of multimedia resources into the education of future foreign language teachers provides unique opportunities for nurturing aesthetic sensibility, cultural awareness, and refined communicative competence. The education of elegance—understood as the development of moral, emotional, and cultural grace—can be meaningfully advanced through thoughtful engagement with art, media, and cultural symbols in digital form. As education continues to evolve in the digital age, the intentional use of multimedia for humanistic and aesthetic development will become an increasingly vital part of holistic teacher preparation.

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SCIENTIFIC AND THEORETICAL FOUNDATIONS OF THE ORGANIZATION OF TRANSPORT AND LOGISTICS SERVICES IN THE NAMANGAN REGION

Abstract: *This article analyzes the current state of organization of transport and logistics services in Namangan region and their theoretical and methodological foundations based on the model. Statistical indicators, regional infrastructure potential, formation of logistics flows, existing problems and strategies for their elimination are covered. Based on diagrams and a roadmap, a conceptual approach is developed to improve the logistics system of Namangan region until 2030.*

Keywords: *transport and logistics, Namangan region, refrigerated transport, digital logistics, agroterminal, roadmap.*

Introduction

The stability of the logistics system is of strategic importance for the country's economy and export potential. The eastern region of Uzbekistan - Namangan region - is a region that combines agricultural production and industrial potential, and is one of the largest suppliers of fruits and vegetables in the republic. However, the unbalanced development of logistics services, weak infrastructure and lack of refrigerated transport prevent the region from realizing its full export potential. The logistics system should be considered not only as a transport system, but also as a whole system of storage, packaging, information monitoring, agro-terminal and customs infrastructure. This article provides an in-depth analysis of the transport and logistics system in Namangan region.

(Methods)

The following approaches and methodologies were used in the study:

Statistical analysis: Based on data from the Ministry of Transport and Logistics, State Statistics Committee for 2020–2024.

Regional monitoring: The activities of logistics centers located in 3 main districts of the Namangan region (Turakurgan, Chortoq, Kosonsoy) were monitored.

Survey and interviews: Interviews with 25 farm managers and 10 logistics companies.

Analysis of international experience: based on the recommendations of FAO, UNESCAP, ITC, practical approaches of European and Asian countries (Turkey, Poland, China) were compared.

Graphical analysis: Regional logistics flows were visualized based on diagrams, cartographic maps, and road maps.

Results

1. Current infrastructure status (2024):

2.

Indicator	Quantity
Active road transport companies	135
Share of refrigerated transport	24.6%
Agroterminals and refrigerated warehouses	2 (Namangan city, Turakurgan)
Average freight transit time	2.8 days
Percentage of losses (en route)	9,2%

3. Chart 1: Annual growth in the volume of transport and logistics services **(2020–2024)**

4.

year	Cargo capacity (thousand tons)
2020	450
2021	520
2022	610
2023	690
2024	740

3. The main problems in the logistics system:

Lack of refrigerated vehicles, lack of digital monitoring, automatic temperature control systems. Poor coordination of interregional transport. Lack of knowledge and experience in special packaging technologies

Discussion:

Analysis shows that the Namangan region has high potential in terms of demand for logistics services, but the current system does not allow for effective management of regional cargo flows. Losses in product delivery remain high due to the reduced fleet of refrigerated vehicles, the poor network of agroterminals, and the lack of a single technology for packaging standards.Mana birinchi diagramma:

2020–2024 In the years, the volume of transport and logistics services in the Namangan region has shown an increase.

Chart 2: Main causes of product losses (in %)

• Lack of refrigeration – 43%
• Packaging errors – 22%
• Incorrect loading inside the truck – 18%
• Transport delays – 10%
• Other – 7%

Roadmap (2025–2030): Development of logistics in Namangan region

year	Measures
2025	Organize mini-logistics points in each district center
2026	Purchase 500 refrigerated vehicles on a subsidized basis
2027	Launch the "Agrologistics Platform" (mobile application + web)
2028	Organize specialized packaging plants
2029	Equip transport with temperature and direction control systems
2030	Increase the number of agroterminals to 7 and open export corridors

Conclusion

Although the transport and logistics potential of the Namangan region is quite high, the shortcomings of the existing infrastructure, technical base and coordination mechanisms do not allow for the full use of these opportunities. Based on the roadmap for 2025–2030:

• The share of refrigerated vehicles will increase from 24% to 50%;
• The number of agroterminals will increase from 2 to 7;
• Losses in freight transportation will be reduced from 9% to 3%;
• Regional logistics will be digitized.

This conceptual plan will serve to bring the regional logistics system to the level of regional competitiveness.

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STATE OF THEORY OF TRANSPORTATION OF FRUIT AND VEGETABLE PRODUCTS IN ROAD TRANSPORT

Abstract: *This article analyzes the current state of fruit and vegetable transportation by road in Uzbekistan, its theoretical and methodological foundations, and areas for improvement based on the IMRAT model. The problems, opportunities, and prospects of the sector are highlighted through statistical data, graphical analysis, layout schemes, and a roadmap. The research is based on data for 2020–2024 and concludes with development plans for 2025–2030. The article is useful for researchers, logistics specialists, and representatives of the agricultural sector.*

Keywords: *road transport, fruit and vegetable products, transportation theory, logistics, refrigerated transport, road map.*

Introduction: Agricultural products, especially fruits and vegetables, play an important role in the economy of Uzbekistan. Since the products are perishable in a short period of time, an excellent transport and logistics system is required to deliver them to markets or export points quickly, safely and in good quality. Unfortunately, at present, the theoretical and methodological foundations of the transportation of fruits and vegetables by road are not sufficiently developed. Deficiencies in the existing infrastructure, technical capabilities and transportation methods lead to a decrease in product quality and economic losses. This article discusses the scientific and theoretical foundations of the transportation of fruits and vegetables by road, based on the current situation, problems and development prospects.

The analysis is enriched with graphical, diagrammatic and pictorial visual aids.

Methods: The study was conducted based on the following sources and methodologies:

• Data from the Committees of Transport, Agriculture and Statistics of the Republic of Uzbekistan for 2020–2024;

• Observations and interviews at farms and logistics companies operating in Tashkent, Namangan and Samarkand regions;

• Methodological recommendations of international organizations such as FAO, ITC on “Cold Chain Logistics” and “Fresh Produce Transport”;

• Comparative analysis and graphic visualization methods.

Results: According to the analysis, the following problems were noted in 2024:

• Refrigerated vehicles account for only 23.8% of the total number of freight vehicles;

• 58% of motor vehicles are technically obsolete and do not have the ability to maintain temperature;

• 40% of packaging does not meet standards, there are frequent cases of crushing and crushing of products;

• Due to the lack of temperature monitoring, products lose up to 9–11% of their quality during 2.5 days of transportation; Delivery delays are increasing due to the lack of GPS and digital logistics management.

Chart 1: Annual volume of fruit and vegetable transportation by road (2020-2024)

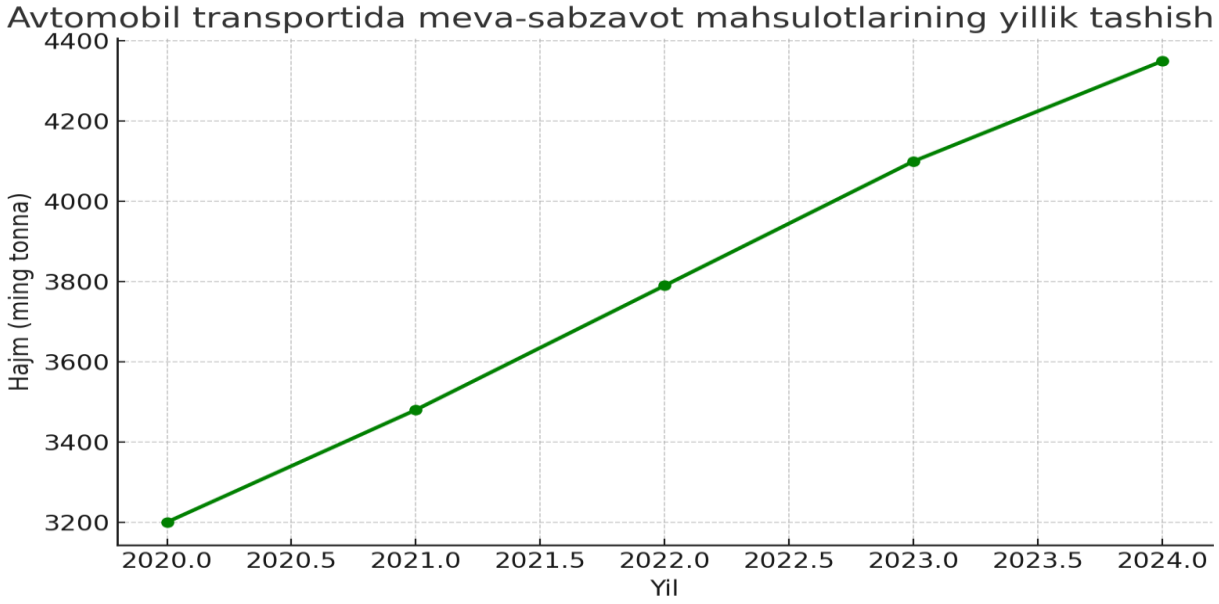
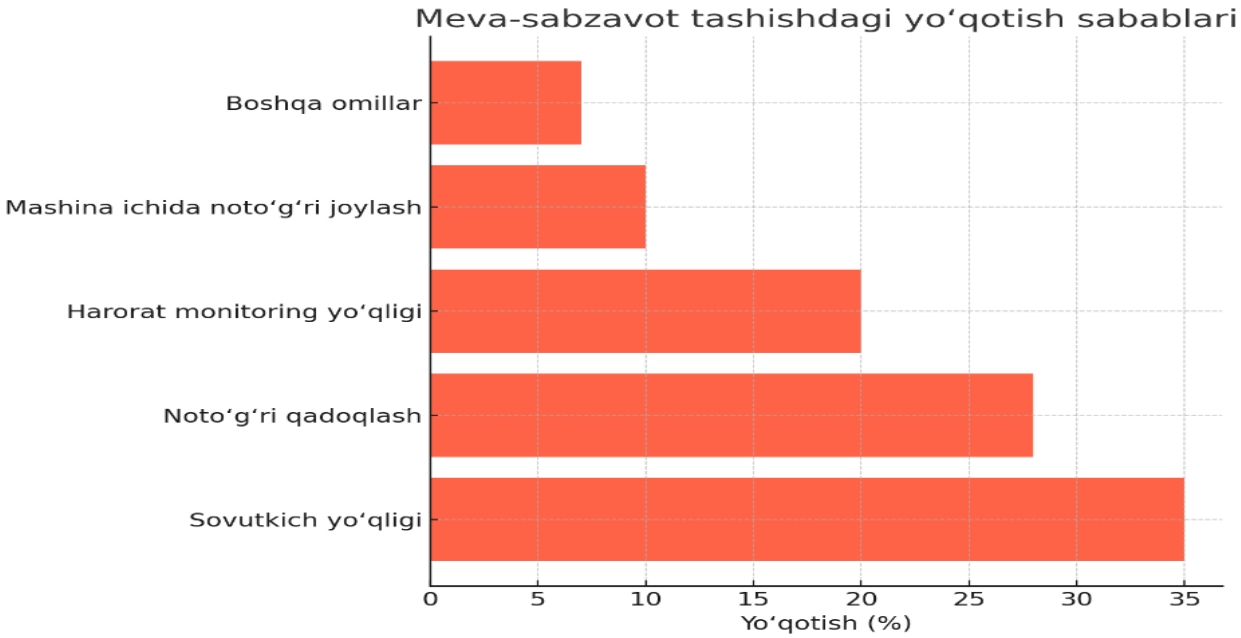


Diagram 2: Causes of losses in fruit and vegetable transportation (in percent)



Reason	Yo‘qotish (%)
Lack of refrigeration	35%
Improper packaging	28%
Lack of temperature monitoring	20%
Placement inside a truck	10%
Other factors	7%

Figure 1: Optimal placement scheme in a refrigerated vehicle (Image attached: fruits and vegetables are placed in a refrigerated container, layer by layer, with air circulation in between).

Discussion The current system for transporting fruits and vegetables by road is reactive, and measures are taken only when problems arise. The lack of a scientific and methodological approach negatively affects product quality and economic efficiency.

International experience, including the experiences of Spain, the Netherlands, and Turkey, shows that special attention is paid to the following during the transportation of products:

- Automatic temperature control in refrigerated vehicles;
- Use of durable, air-permeable materials in packaging;
- Order of product placement according to height and weight;
- Monitoring with GPS and temperature sensors during transport;
- Pre-cooling of products before transportation;
- Responsible control at all stages of the logistics chain.

Roadmap (2025–2030): Improving the fruit and vegetable transportation system

Year	Planned measures
2025	1 agroterminal in each region; 1,000 refrigerated vehicles will be purchased
2026	National standards for packaging and transportation methods will be developed
2027	Introduction of GPS and temperature monitoring systems to 60% of vehicles
2028	Financial incentives for farmer-logistics company cooperation
2029	Program for purchasing refrigerated vehicles from local manufacturers
2030	Full implementation of the “cold chain” chain and doubling export volumes

Conclusion

The system of road transportation of fruit and vegetable products in Uzbekistan is still in the transformation stage. Outdated vehicles, lack of refrigeration equipment, lack of standard packaging and temperature control systems reduce the efficiency of this sector.

By strengthening the scientific and theoretical approach to transportation, implementing technological solutions in practice, and adapting international experience to local conditions, a high-quality and efficient logistics system will be created. This will increase not only domestic consumption, but also export potential**.**

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SOCIAL AND PHILOSOPHICAL FACTORS IN ENHANCING THE SENSE OF PATRIOTISM AMONG YOUTH

Abstract: *This article explores the socio-philosophical foundations of patriotism among youth. It highlights the role of national ideology, education, culture, media, and community structures in fostering patriotic consciousness. The paper argues that patriotism is not innate but socially constructed through various institutional and cultural mechanisms. In the context of globalization and identity challenges, the article underscores the need for integrated approaches to nurture national values and civic responsibility among the younger generation.*

Keywords: *patriotism, youth, national idea, civic identity, social philosophy, education, culture*

1. Introduction

The process of nation-building in post-Soviet states, including Uzbekistan, has emphasized the crucial role of youth in sustaining national identity and cultural continuity. Patriotism, as both a moral and civic virtue, serves as a key indicator of the strength of national unity. From a social philosophy perspective, patriotism is not merely an emotional attachment but a value system reinforced through education, media, and collective memory.

2. Conceptualizing Patriotism: A Philosophical Approach

Philosophically, patriotism intersects with concepts such as identity, belonging, and moral duty. Classical and contemporary thinkers view patriotism as a means of aligning personal and national interests. Social philosophy analyzes it in terms of collective agency, cultural inheritance, and the ethical responsibilities of citizens.

Patriotism is a complex social and moral phenomenon that reflects love for the Motherland, respect for its history, culture, traditions and readiness to defend its interests. Social and philosophical analysis allows us to consider patriotism as a form of collective identity associated with historical memory, cultural continuity and moral responsibility of citizens.

Patriotism (Greek: πατριώτης - "compatriot", πατρίς - "homeland", "fatherland") is a political principle and social feeling, conscious love, attachment to the homeland, devotion to it and readiness to sacrifice for it, conscious love for one's people, their traditions.

Patriotism is rejected by universalist ethics, which believes that man is equally bound by moral ties with all humanity without exception. This criticism began with the philosophers of Ancient Greece (the Cynics, the Stoics - in particular,

the Cynic Diogenes was the first to describe himself as a cosmopolitan, that is, a "citizen of the world"

Researchers divide patriotism into “**blind**” and “**civic**”.

Prominent philosophers have defined "blind" patriotism as an attachment to one's country with an unquestioning positive assessment of one's homeland and intolerance of criticism of one's state. In contrast, "civic" or "constructive" patriotism is a love for one's country, associated with an analysis and criticism of the existing situation in it and a desire to change it for the better.

Their study of American students found that students with the "blind" type of patriotism were characterized by low political activity, high levels of nationalism, increased sensitivity to external threats, and reverence for state symbols.

"Blind" patriotism was associated with uncritical support for all actions of the country, as well as a preference for pro-American sources of information

In studying the role of patriotism, philosophers have found in their research that citizens inclined toward symbolic, emotional, or instinctive patriotism were more receptive to calls from politicians or presidential candidates to unite around national feelings and symbols (flag, anthem).

In contrast, “civic” patriotism was correlated in the philosophers’ study with a variety of measures of political activity, familiarity with different sources of information and points of view, and confidence in the ability to influence the life of one’s country for the better.

2. SOCIAL AND PHILOSOPHICAL FACTORS IN THE FORMATION OF PATRIOTISM IN YOUTH

2.1 National idea and ideology

In Uzbekistan, the formation of youth policy is based on the ideas of national revival, respect for traditions and modernization of society. The national idea acts as an ideological framework for patriotic education, contributing to the formation of civic identity.

National idea – embodies in general form the highest ideal of the nation, its will, long-term historical goals, desires and hopes. It expresses the essence of the society to which we aspire and which we are building.

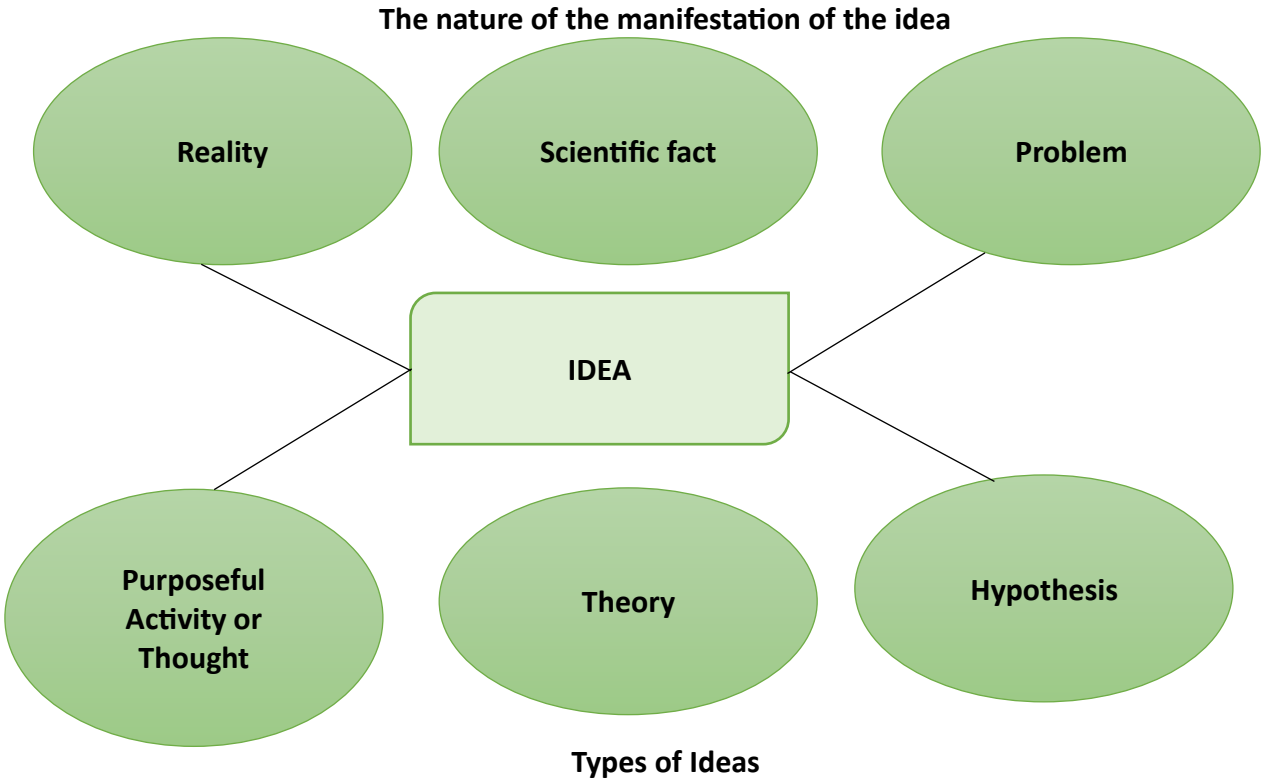
The deeper the national idea penetrates into the consciousness of the people, the higher their self-awareness, the stronger their unity and community, the more they feel, regardless of their nationality, language and religion, as a single people - Uzbeks.

National ideology is formed around the national idea.

The national idea of Uzbekistan-is a set of ideas expressing the main goals and aspirations of all members of society, regardless of their ethnicity, social status, gender, age and language, uniting them and linking their past and future with each other, serving the realization of their age-old aspirations and hopes.

In turn, ideas are one of the unique forms of reflection of reality and scientific knowledge, a product of human thinking, as well as a set of thoughts that direct a person and society to a certain goal.

Ideology is a set of ideas that embody the needs, goals, interests, desires and aspirations of certain social groups, social strata, nations, states, people and society, as well as the principles of their implementation.



Creative: noble, purposeful, exalting man (ideas of national independence, ideas of a comprehensively developed man).

Destructive: Evil, bringing grief and misfortune to people, sowing discord and unrest (crusades, religious fanaticism, fundamentalism, dogmatism, fascism, Bolshevism, racism and chauvinism, etc.)

Educational institutions play a key role in the formation of patriotic consciousness. Through academic disciplines, extracurricular activities and projects, respect for state symbols, heroes of the Fatherland, as well as a sense of responsibility for the fate of the Motherland are formed.

The structure of patriotic education of children and adolescents in educational organizations mainly includes:

– a set of educational tasks related to the formation of the need to become a patriot;

– a patriotic worldview and patriotic feelings;

- respect for the Armed Forces of the country and their military traditions, interest in studying military affairs;

- moral and psychological qualities necessary when performing tasks to ensure armed protection of the state and its national interests;

- knowledge of the basics of military affairs and the ability to apply them in practice; the necessary physical qualities of children and adolescents;

– pedagogical activity of educational subjects, carried out taking into account the requirements of psychological and pedagogical science and ensuring the formation and development of students in accordance with the set educational goals;

– controlled activities of adolescents for self-improvement, carried out in accordance with the conscious ideal of a citizen ready to carry out tasks to ensure the armed protection of the country and its national interests.

2.3 Mass culture and media space

Mass media, the Internet and social networks have a powerful influence on the worldview of young people. The creation and promotion of patriotically oriented media content is becoming an important tool for education.

The main areas of activity of mass culture and media space in influencing the worldview of young people:

• development of civilized forms and methods of public control over the formation of spiritual values in society that meet the national interests of the state, education of patriotism and civic responsibility for its fate;

• improvement of legislation regulating relations in the area of constitutional restrictions on the rights and freedoms of man and citizen;

• formation of legal and organizational mechanisms for ensuring constitutional rights and freedoms, raising the legal culture of citizens in the interests of counteracting the deliberate or unintentional violation of the constitutional rights and freedoms of citizens in the sphere of the spiritual life of society;

• development of effective organizational and legal mechanisms for access of the media and citizens to open documented information on the activities of government bodies and public associations, constant informing of citizens about the most important events and problems of spiritual life;

• development of special legal and organizational mechanisms to counter violent and monopolistic information-psychological influences on the mass consciousness of society, uncontrolled commercialization of culture and science, as well as mechanisms to ensure the rational use of information resources accumulated by society, which constitute the national heritage;

• coordination of the activities of government bodies, enterprises, institutions and organizations regardless of the form of ownership;

• establishment of responsibility of officials, government bodies, legal entities and citizens for compliance with information and psychological security requirements;

• development and creation of mechanisms for the formation and implementation of the state information policy of the Republic of Uzbekistan;

• development of methods for increasing the effectiveness of state participation in the formation of the information policy of state television and radio broadcasting organizations and other state media.

2.4 Family and Community (Mahalla)

Traditional structures such as the family and local community (mahalla) continue to shape moral attitudes, including loyalty to the homeland and communal responsibility.

The family is the main social environment for the people of our country and a part of society, which, in accordance with the social environment formed in the family, is called upon to educate the future generation as patriots of their country, devoted to the ideas of their family, parents, brothers, sisters, close relatives, neighbors and the Motherland.

The Research Institute "Mahalla va Oila" under the Ministry of Mahalla and Family Support of the Republic of Uzbekistan was established in accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated June 10, 2020 No. 367.

The Institute is a specialized state research institution that promotes the strengthening of community and family institutions, the transformation of citizens' gatherings into real partners of the population and the implementation of the idea of "Healthy Family - Healthy Society".

Research areas of the institute

In turn, the institute has 16 main directions.

Activities of the Institute

• During its activity the Institute carries out:

• Regular scientific seminars and round tables on current issues of taking the system of working with families and women in mahallas to a new level, increasing the social activity of young people, further strengthening the role and status of citizens' gatherings in transforming the region into a crime-free zone;

• Conducting scientific and scientific-practical conferences on topics such as the introduction of a system based on the principle of a “prosperous and safe mahalla”, priorities for strengthening the system of working with the everyday problems of the population in the region;

• organization of scientific, scientific-practical conferences, seminars, meetings on issues of strengthening the family in mahallas, supporting women, employment, developing entrepreneurship, public health, improving homes and streets, increasing the effectiveness of spirituality and education;

• development of analytical materials and scientifically based proposals based on the results of the event;

• training of highly qualified scientific personnel in the field of support for society and family at the institute, continuous improvement of the qualifications of researchers;

• implementation of cooperation with educational and scientific institutions of the republic in the areas of their activities, development of international relations with leading research institutions of foreign countries.

3. Conclusions and Recommendations

A holistic and philosophically grounded approach is required to nurture patriotism among youth. Policies should integrate educational reform, media

strategies, community engagement, and philosophical dialogue to foster resilient civic identities.

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LATE RESULTS OF SURGICAL TREATMENT OF CHRONIC TONSILLITIS IN CHILDREN WITH RHEUMATISM

Abstract: *The article studies the late results of surgical treatment of chronic tonsillitis in children with rheumatism. We observed 386 children with rheumatism for 6 years. These patients were divided into three groups: the first included 145 people suffering from rheumatism and chronic tonsillitis, who had been undergoing conservative treatment for chronic tonsillitis for the past few years. Recurrences of tonsillitis and paratonsillar inflammation after tonsillectomy ceased in 97% of cases.*

Keywords: *children, chronic tonsillitis, rheumatism, rheumatic myocardial sclerosis, tonsillectomy.*

Introduction. The study of long-term outcomes of surgical treatment for chronic tonsillitis in patients with rheumatism has been extensively covered in the literature [3,4]. Various data on the effectiveness of this treatment are reported in both domestic and international literature [1,2]. Several researchers have noted better outcomes in rheumatism treatment when tonsillectomy was performed as early as possible in the disease's progression and in younger patients [5,6]. When evaluating the results of surgical treatment for chronic tonsillitis in patients with rheumatism, it is recommended to consider the condition of the cardiovascular system, the presence of rheumatism relapses and recurrent attacks, the development of heart defects, and the progression of cardiac pathology [7]. These factors prompted us to investigate the long-term outcomes of surgical treatment for chronic tonsillitis in children with rheumatism.

Study Objective. The aim of this study was to evaluate the long-term outcomes of surgical treatment for chronic tonsillitis in children with rheumatism.

Materials and Methods. Over a 6-year period, we observed 386 children with rheumatism, aged 6 to 14 years. Of these, 118 were girls, 128 were boys, 140 were urban residents, and 146 were from rural areas. Rheumatic myocardiosclerosis was diagnosed in 253 patients, and heart defects (predominantly mitral valve insufficiency) were identified in 33 patients.

Study Results. Examination of ENT organs revealed chronic tonsillitis in 246 patients, while 140 patients showed no ENT pathology. Chronic tonsillitis was significantly more common among urban residents (69.1%) than rural residents (54.8%). Boys and girls were equally affected by chronic tonsillitis. For long-term monitoring of the rheumatic process, patients were divided into three groups. The first group included 145 patients with rheumatism and chronic tonsillitis who had

received conservative treatment for chronic tonsillitis in recent years. The second group consisted of 101 patients who underwent tonsillectomy at various intervals after the onset of rheumatism and chronic tonsillitis. The third group, serving as the control, included 140 patients with rheumatism alone.

Tonsillectomy was performed in the first year of rheumatism onset in 16 patients, after two years in 27, in the third year in 22, in the fourth year in 7, in the fifth year in 4, and in the sixth year in 7. The remaining 4 patients underwent tonsillectomy in the 8th or 9th year of the disease. Notably, 6 patients in the second group were unaware of the onset of rheumatism, and 8 patients had tonsillectomy performed for chronic tonsillitis one year before the rheumatism diagnosis. Recurrent attacks were recorded in 6.2% of cases in the first group. In the second group (tonsillectomy patients), recurrent rheumatism attacks were significantly less frequent, occurring in only 3.9% of cases, primarily in those who underwent surgery more than 5 years after disease onset. No heart defect formation was observed in the postoperative period in the second group. In the third group, recurrent rheumatism attacks were diagnosed in 2.1% of cases. It is noteworthy that after tonsillectomy, relapses of tonsillitis and paratonsillar inflammation ceased in 97% of cases. The best outcomes in rheumatism treatment were observed in patients who underwent surgery within the first two years of disease onset. The long-term outcomes of surgical treatment for chronic tonsillitis in children with rheumatism should, in our opinion, be studied in collaboration with a pediatrician, taking into account the condition of the cardiovascular system.

Conclusion. Over 6 years, 386 children with rheumatism, aged 6 to 14 years, were observed. These patients were divided into three groups: the first group included 145 patients with rheumatism and chronic tonsillitis who received conservative treatment for chronic tonsillitis in recent years; the second group included 101 patients who underwent tonsillectomy at various intervals after the onset of rheumatism and chronic tonsillitis; the third group, the control, consisted of 140 patients with rheumatism alone. Recurrent rheumatism attacks were recorded in 6.2% of cases in the first group, 3.9% in the second group, and 2.1% in the third group. Relapses of tonsillitis and paratonsillar inflammation ceased in 97% of cases after tonsillectomy

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NATIONAL CHARACTERISTICS OF PHRASEOLOGICAL UNITS FORMED ON THE BASIS OF PROPER NOUNS

Abstract: *This article examines the phraseological units formed with the participation of proper nouns, emphasizing their national-cultural specificity. Through examples from English and Uzbek, the study explores how names of historical figures, literary characters, and mythological beings contribute to the formation of idiomatic expressions that reflect the worldview, values, and cultural memory of a given people.*

Key words: *Phraseological units, proper nouns, cultural identity, national heroes, historical context, idioms, metaphorical meaning, linguistic expression, translation challenges, intercultural communication.*

Introduction. Phraseological units are an essential component of a language's expressive means, reflecting not only linguistic structures but also cultural identity. Among them, those formed on the basis of proper nouns carry rich historical, cultural, and emotional connotations. These idioms are strongly marked with national specificity and often resist direct translation due to their culturally embedded meanings. Phraseological units — also known as idioms, set expressions, or fixed phrases — form a vital part of any language. They enhance its richness, flexibility, and expressive power. Idioms encapsulate meanings that go beyond the literal interpretation of individual words. They often rely on historical, social, or cultural contexts to convey particular shades of meaning. Among these, **phraseological units formed with proper nouns** (e.g., names of people, places, events) are especially rich in cultural and emotional undertones.

Proper nouns — names of people, places, mythological figures, or literary characters — often become the basis for stable idiomatic expressions. These names, when used in phraseological units, are usually associated with specific qualities or symbolic meanings derived from historical events, popular literature, religion, or collective memory.

Examples in English include:

- *He's a real Romeo* – referring to a passionate lover, based on Shakespeare's character.
- *To meet one's Waterloo* – to face a final, crushing defeat, based on Napoleon's loss at Waterloo.

In Uzbek:

- *Nasriddin afandi yo'li bilan hal qilish* – to resolve something with wit or trickery, based on the popular folk character Nasriddin Afandi.

- *Temur kabi qat'iy* – showing firmness and strength, linked to the historical figure Amir Temur.

National and Cultural Markedness. Phraseological units with proper names reflect the unique cultural and historical experience of each nation. These expressions are closely tied to national heroes, writers, politicians, or legendary figures. The choice of these proper nouns reveals which figures are culturally significant or ideologically symbolic within that nation. The presence of a proper name in a phraseological unit is rarely arbitrary. Rather, it is the result of a collective cultural process whereby certain historical or fictional figures are elevated to emblematic status. These figures may include national heroes (e.g., Temur in Uzbek, George Washington in American English), renowned writers (e.g., Pushkin, Shakespeare), political leaders (Churchill, Lenin), religious figures (Jesus, Muhammad), or mythological and folkloric characters (Don Quixote, Nasriddin Afandi). When embedded in idioms, these proper names acquire metaphorical meanings that resonate strongly within the cultural and historical context of the respective language community.

For example, in English, the idiom to meet one's Waterloo signifies a decisive or ultimate defeat, derived from Napoleon Bonaparte's historical loss in the Battle of Waterloo. In Uzbek, an expression like Afandi qilganidek qilish implies solving a situation cleverly or humorously, referencing the witty folk figure Nasriddin Afandi. Such expressions demonstrate how phraseological units serve as linguistic crystallizations of a nation's collective consciousness.

For example:

- In English-speaking cultures, *a Benedict Arnold* refers to a traitor, based on the historical American figure.
- In Russian, *как Обломов* (like Oblomov) means someone lazy and indecisive, derived from Goncharov's novel character.
- In Uzbek culture, references to historical and literary figures such as *Alpomish* or *Ulug'bek* evoke bravery, intelligence, or nobility.

These idioms provide insights into the values and narratives prioritized by each culture — heroism, betrayal, cleverness, or love — and how these values are preserved linguistically.

Linguistic and Pragmatic Features. Proper noun-based idioms function as condensed narratives. They often rely on shared cultural knowledge and background awareness. Pragmatically, such expressions serve to categorize people or actions quickly, often with an evaluative or emotional undertone. Their usage can signal in-group belonging or serve as a rhetorical tool in discourse.

Moreover, many of these idioms are non-compositional and metaphorical, making them challenging for learners or translators. Their national coloring makes it essential to study them within cultural-linguistic contexts.

Cross-Linguistic Comparison. While some phraseological units are culture-specific, others may have near-equivalents in different languages, often adapted to the respective national context. For example:

English	Uzbek Equivalent	Meaning
A Scrooge	Bachil Bo‘richi	Stingy person
A Don Juan	Qizboz, mahmadona	Womanizer
To carry the cross	Ko‘tarib yurmoq	To endure a burden
Herculean task	Temurga xos ish	A task requiring great effort

This comparison highlights the presence of universal concepts (love, struggle, betrayal) framed within national-symbolic expressions.

Conclusion. Phraseological units formed on the basis of proper nouns are vivid examples of how language embodies the historical memory and cultural identity of a people. These expressions serve not only as linguistic tools but also as cultural signifiers. Understanding their national characteristics is crucial in language learning, translation, and intercultural communication. The study of such idioms opens doors to deeper cultural literacy and awareness in both native and foreign language contexts.

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THEORIES WHICH'RE RELATED TO THE SOCIALIZATION OF PRESCHOOL CHILDREN

Abstract: *The article presents the theoretical ideas of psychological scholars regarding the socialization of a child's personality. The psychological characteristics of the socialization of preschool-aged children are explored. The process of socialization has been analyzed.*

Key words: *socialization, personality, culture, civilization, communication, interaction, component, behavioral activity, "self" concept, criteria, aspect, mechanism.*

Introduction

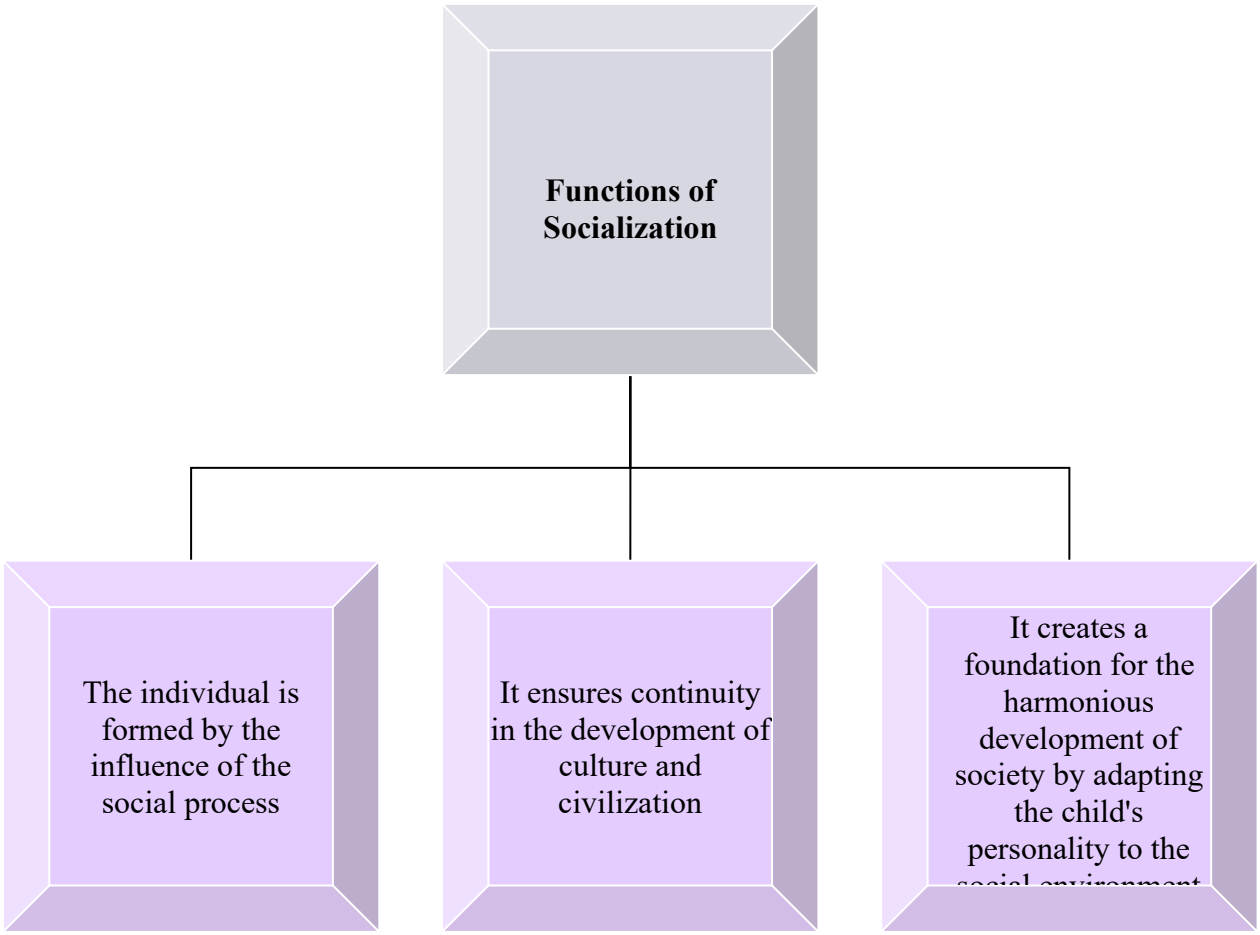
Socialization is essential for every individual to fully organize their life by acquiring necessary skills. What distinguishes humans from other living beings is their behavior and ability to engage in communication. The socialization of an individual begins primarily within the family. Initial socialization starts from birth and continues until the individual reaches maturity. The process of early socialization is crucial for a child, as it serves as the foundation for their future social integration.

The unique characteristics of the socialization process are studied in various fields such as philosophy, sociology, social psychology, the history of pedagogy, and ethnography.

Literature review and methodology

Nowadays the unique characteristics of the socialization process are being studied by representatives of the symbolic interactionism schools in chicago and iowa, as well as by proponents of the "psychodrama" approach. It is essential to consider ontogenetic and phylogenetic approaches in organizing pedagogical-psychological processes aimed at the socialization of preschool-aged children.

Today, there is a noticeable trend in pedagogy and psychology of utilizing a comprehensive range of methods and approaches developed through philosophical, sociological, socio-psychological, and historical-ethnographic analyses to address socialization issues. The socio-pedagogical system, which is crucial for the successful development of society, involves the process of an individual assimilating social norms and values.



Foreign scholars such as I.S. Kon, A.V. Mudrik, V.S. Mukhina, A.V. Petrovsky, and others have conducted research on the socialization of children. These scholars have established that the socialization of children primarily begins within the family.

A.P. Ganicheva, O.L. Zvereva, and S.V. Kupriyanova confirm that the socialization of children is ensured through family upbringing.

Theoretical analyses show that the socialization of children is realized through pedagogical influence, where family members and educators organize the child's interaction with siblings, peers, and others during play, work, and independent activities.

Socialization refers to the process of an individual's formation under the influence of culture and communication, ensuring the interaction of subjects with one another. This process occurs throughout a person's entire life.

Z. Freud emphasizes certain mechanisms in a child's development. According to him, “the relationships with parents play a significant role in the child's maturation and the formation of their personality” [2].

The philosophical interpretation of socialization was founded by G. Tarde. Furthermore, issues of socialization have been explored in Z. Freud's classical psychoanalysis, in interactionism, in the works of L. Vygotsky and A. Leontiev, and in T. Parsons’ structural-functional analysis.

J. Piaget asserts that there are significant stages in the development of a child's personality, but he emphasizes that social influence plays a crucial role in transitioning from one stage to the next. According to J. Piaget, “since cognitive activity occurs through cognitive processes, the child’s socialization adapts to the demands of society and achieves balance through new experiences” [8].

M. Mead and R. Benedict studied the influence of culture and parents at different stages of an individual’s development, demonstrating that each stage requires a specific form of socialization. Socialization is not limited to childhood but continues throughout a person’s entire life. Socialization is a bidirectional process that also has a noticeable impact on the progress of society.

The Greek philosopher Plato believed that “the formation of behavior in children is one of the essential criteria for their level of socialization, as it involves consciously adhering to the norms and rules of behavior in societs” [3].

In his dialogues titled “The Republic” and “Laws”, Plato addressed the issue of the relationship between the individual and society, arguing that society is an unchanging unity in relation to the individual, and its development is governed by the laws of societal progress. In contrast, Aristotle expressed the opposing view, stating that the individual is the cause of all social changes because they possess psychological systems that enable this. In other words, while Plato resolved the issue of the relationship between the individual and society in favor of society, Aristotle approached it from the perspective of the individual's benefit.

Later philosophers of the modern era—Hobbes, Helvetius, Locke, Rousseau, Hegel, Machiavelli—as well as Eastern philosophers such as Al-Biruni and Al-Farabi, also attempted to explain the contradictions between the individual and society on a scientific basis in their works. However, none of them were able to elevate this issue to the level of a socio-psychological problem. [p 1,13.]

According to D.M. Baldwin, “the process of socialization also influences the child's self-evaluation and personal qualities” [p 2; 47]. The scholar emphasized the social significance of play, arguing that play serves not only as a form of practice but also as an important tool for socialization. It prepares children for the complex social relationships they will encounter in life.

The American sociologist Margaret Mead proposed the idea that “the socialization of children occurs differently in societies based on diverse cultural practices and traditions” [p 6;57]. She affirmed that socio-cultural factors play a leading role in the psychological development of a child. In her scientific views, Mead argued that different cultural practices shape a child’s self-awareness and self-evaluation, which are tied to the cultural traditions of the specific nation. She also highlighted the importance of the characteristics of education and upbringing, as well as the role of family interaction skills in guiding the child's development.

Results

Ensuring that preschool-aged children interact with their peers is crucial. Children begin to shift their attention from adults to their peers, and their engagement in communication gradually expands at this age. While 3-4-year-old

preschool children can easily switch companions in their interactions with peers, by the age of 6-7, they start striving to communicate with specific children.

Hierarchies begin to form within groups, with leaders emerging who can organize the activities of other children and express their sympathy toward them.

Children develop self-evaluation skills and gradually adapt to communication in the process of interacting with peers. They compare themselves with other children, increasingly showcasing their abilities and expressing themselves more prominently. To gain recognition from those around them, they demonstrate themselves in various activities.

Discussion

The important aspects of socialization are characterized by the individual's activity and their personal perspectives on external influences. Therefore, the socialization and formation of an individual occur under purposeful conditions through mutual interaction, the direct influence of the environment, and elements of spontaneity and disorganization. The concepts of "socialization" and "upbringing" are closely related, as the process of socialization proceeds more effectively through purposeful upbringing. The socialization of an individual takes place under the conditions of their life activities. This process is realized through the individual's acquisition of cultural skills, education, upbringing, and participation in social life. The success of socialization depends on changes in behavior and adherence to societal demands.

The individual discovers personal experience through social qualities. The formation and development of the "Self" concept cannot occur without interaction and activity in preschool-aged children. The components of socialization consist of activity, communication, and self-awareness. In their activities, children demonstrate personal qualities, independence, initiative, creativity, and personal agency. In the context of communication, children deeply understand themselves and the participants in the communication process, grasping the essence of mutual interaction and the perception of others. As a result of self-awareness, the "Self" concept develops, social status is acquired, social roles are assimilated, social perspectives are formed, and moral upbringing takes place. According to psychological scholars, the process of socialization involves the individual's interaction with the surrounding environment, the assimilation of societal life, and social experiences. The unique characteristics of the individual are manifested through their participation in social situations.

The points mentioned above demonstrate that personal relationships manifest in both internal and external activities, and the process of socialization is not always comprehensive if evaluated solely based on external indicators. Socialization occurs within the process of upbringing, which can be both organized and spontaneous, though it is not always purposeful.

Conclusion

In the process of socialization, preschool-aged children discover personal qualities and assimilate the moral norms necessary for daily life. The socialization

process of children is interconnected with biological, social, moral, and other processes.

We have identified the following criteria for the socialization of preschool-aged children in our research:

- Independence from others, reliability, and self-reliance.
- Formation of societal values and stereotypes.
- Adaptation to behavioral norms and the ability to apply them to their lifestyle.

Socialization develops through mutual relationships and interactions, and the "Self" concept evolves in children. As a result, they learn to express themselves, transform their potential, satisfy their needs, articulate their personal thoughts, make independent decisions in problem-solving, and develop initiative. The child achieves the ability to adhere to societal norms and values.

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THE MAIN AGROTECHNICAL PROPERTIES OF CHERRIES FROM LEGUMES

Annotation. *Cherry is a fruit that many people love and eat. The cherry fruit is also characterized by its richness in vitamins. This fruit is also rich in the minerals calcium, iron, magnesium, phosphorus, potassium, sodium, which are important for our body. There are usually 2 types of cherries: sweet and bitter (sour). Sweet cherries are eaten as wet fruits, while bitter cherries are mainly used in desserts and canning.*

Keywords. *Cherry tree, shaping and shrubbing, watering and fertilizing, planting calcium, iron, magnesium, phosphorus, potassium, sodium, seedlings.*

The cherry tree is extremely delicate and can easily die due to various diseases (moniliosis, bacterial necrosis, cytosporosis, root throat). Taking into account the unpretentiousness of caring for cherry trees, it is recommended to plant them in soil with good moisture permeability and artificially raised. Bitter Cherries have a self-pollination peculiarity, but sweet cherries should be planted together with pollinating varieties so that they give a good harvest. For planting seedlings, it is necessary to choose a place where there is a lot of sunlight. It is necessary that the cherry tree is saturated with sunlight for at least 6 hours in a day. They cannot grow well in areas where regular fog falls, especially since the fog that falls during the summer season can prevent them from saturating themselves from the sun.

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Since growing cherry trees have a widespread root system, they are practically not required to apply excess fertilizer. Taking into account their fast growth husk, it is possible to determine at what point additional fertilizer is required. The fact that the tip of the tree branches grows less than 25 centimeters per year

means that there is a demand for fertilizer. From other signs that indicate a demand for additional feed, again, it is the fact that the leaves are smaller than in the previous year. By mid-summer there may be premature yellowing, as well as shedding before the arrival of autumn. In cases other than these, it is not recommended to fertilize cherry trees. Otherwise, the trees will grow rapidly, and this can cause a decrease in yield.

Cherries begin to ripen mainly in late spring. It is imperative to dial the fruits with a bandage, in akshol they quickly lose their quality. The fruit band is cut off from the ground touching the branch without damaging it. Shaping fruit trees has been done for centuries by cutting off tree branches and branches. Shaping the tree trunk in the desired direction is an effective method of creating a strong tree base. Shaping trees is an important factor for their long life. Cutting trees can seem complicated for those who are just learning the secrets of gardening. However, minor mistakes made during the cutting process usually do not cause much damage to the tree.

Shaping and shrubbery are considered an important event in the care of cherries. With it, a branch-branch is formed, which carries the expected large yield weight. In the first year, the height of the tree trunk is determined. In this case, the height of the body is measured 60-70 CM. 4-6 buds are counted towards the top, and the upper part is cut off from these buds. In the spring of the second year, the base of the first yarus is formed. The first yarus branches are formed from the central body towards different sides, which are cut off leaving a length of 0.5 meters. In the early spring of the third year, the branches growing towards the inside of the branch-branch or in a vertical position are cut off. In this, the second yarus is formed and their length is regulated.

The branches of the second yarus should be 15 cm shorter and 20 cm lower than those of the first Yarus. The main body is cut after 6 buds, measuring 0.5 meters above the point where the second yarus begins. In the spring of the fourth year, the formation of the first two yaruses is completed. If branches have formed above the tree, a third yarus is also formed. To do this, the branches are cut 20 cm longer than the length of the central body. In the spring of the fifth year, the formation of cherry Horn-Sheba is completed. From this year, cherries are included in the full Harvest. In the orderly formation of branches of cherry trees-cherry seedlings are shortened at a distance of 75-90 cm from the ground in early spring, regardless of the period of planting (in autumn or spring), depending on what height it is planned to form the first branch.

Once the growing branches reach a length of 10-15 cm, the wood is bent from the leading branch to the horizontal position with the aim of forming fleeing branches at right angles. After 2-3 weeks, horizontally bent branches begin to grow in a vertical position under the influence of the pole. In the early spring of the second year after planting, three to four leading branches are selected, which serve as leaders in the tinym period of the shoots (when the distance between the trees is 6 meters), and four to five leading branches are selected when the tree is larger. The main thing is that the direction of the leading branches is required to be vertical.

Leaving one or two more temporary additional branches in an effort to prevent the leading branches from growing strongly will not be beneficial. The remaining branches are cut off. The leading branches are shortened at a distance of 60-90 cm from the base. In a cherry tree that has entered the crop, growth subsides. The branchlets thicken. It should be remembered that in order for flower buds to form on cherry branches, a large amount of light is required. Therefore, large branches blocking light from falling into the tree branch-trunk, as well as excess bachki, are removed from the base of the semi-scalloped branches, which are temporarily left at the top of the tree in order to prevent the growth of branches. These are held in early spring. The large branches should be on the base of the branch-trunk of the tree, and the branches located above them should be relatively thin. Each leading branch should look individually sickle-shaped (ductile).

Conclusion

In the process of shaping the fruit trees studied, if the tree grows strongly and the lower branch-branches thicken, the inner and branch branches of the branch-branches are shortened in summer. The formation of side branches of the second order is carried out in order to ensure that the lower part of the tree is creamy and relatively thin as it rises

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THE MAIN AGROTECHNICAL FEATURES OF SUBTROPICAL FRUIT PLANTS

Annotation. *Pomegranate is a heat-loving plant, when the sum of the useful temperature reaches 5000 0s, excellent quality fruit is obtained from it. In the southern regions, pomegranate is grown on lalmikor land at an altitude of 1200 m above sea level, with an aging rainfall of 700 mm. Pomegranate gardens are built from annual seedlings. The land for establishing a pomegranate garden is prepared in the usual way, as if prepared for other fruit trees. Pomegranate grows on fertile loamy soils, protected from cold winds and heated by the sun.*

Keywords. *Pomegranate figs, pomegranate seedlings give shape to the main branches dates, subtropical fruit trees.*

It does not grow well on saline and waterlogged lands. Pomegranate seedlings are planted at intervals of 4 x 2 m from each other, and when grown on lalmikor land, they are planted at intervals of 5 x 4 m. Pomegranate is an edge-pollinated plant, but can also be pollinated on its own. Therefore, mixing different varieties of pomegranate increases the yield. Pomegranate seedlings are planted mainly in Spring - late March to early April. The depth of the mows in which the seedlings are planted is 60 cm, the width is up to 75 cm. Before planting seedlings, the land should be driven off by turning over with plantain plugs to a depth of 40-50 cm deep. Seedlings are watered furrowed after planting. 2-3 days after watering, the seedlings are straightened and, if necessary, the soil is pulled under them.

The first year of planting pomegranate seedlings is watered 10-12 times during the growing season (with an account of 600-700 m3 per hectare). The moisture content of the pomegranate soil is maintained at 75-80% compared to the wet capacity of the field. The last water is given in the first decade of October. With the maturation of the soil after each year of watering, the irrigation egats and plant bases and the rows are loosened. The plant row is loosened 4-5 times during the summer. In the fall, pomegranate bushes are taken with a pillow and buried with soil. Pomegranate bushes are grown in the southern regions without burial, where there is no severe frost in winter and the temperature does not drop below 15-16o. For the first two years, the rows are left to black plough, after which it is advisable to plant siderat crops between the rows. The pomegranate that has entered the crop is watered 9-10 times during the growing season. The norm of watering is 800-900

m3 per hectare, pomegranate bushes are invaded during the growing season to be easy in winter.

The branches are not watered in winter so that they do not mold, but are watered once or twice per hectare in the norm of 1500-2000 M3 when winter is very dry. Young pomegranates are fertilized with manure at the expense of 25-30 t per hectare from the third year after building a garden, and from the fifth year, manure from 35-40 T is used every three years. In the first two years of Mineral fertilizers, 30-35 kg of nitrogen, 20-25 kg of phosphorus and 7-8 kg of potassium are applied annually on the account of the substance acting on the hectare. In the third, fourth year, the amount of nitrogen and potassium is doubled, and phosphorus is increased by 1.5 times. The norm of nitrogen per hectare after the age of five years and above is reached by 100-120 kg/ha, fosforni by 60-65 kg and kaliyniki by 25-30 kg/ha.

In low-fertility lands, the amount of nitrogen and phosphorus is increased by 1.5-2 times, of which 50% of nitrogen is given in summer-long feeding. Fertilizers are applied in young gardens to a depth of 15-20 cm, and in pomegranate fields that have entered the crop to a depth of 35-40 CM. In the fall, after the pomegranate bushes are buried in the winter, the rows are plowed to a depth of 25-30 CM. The plowed ground is boronated in spring, while the sides of the row plants are loosened 2-3 times during the growing season. Regular watering plays an important role, otherwise the pomegranates will crack. After each gall or both watering, the middle is loosened.

Conclusion

Garden care agrotechnics will also be the same as in pomegranates. Therefore, let's dwell only on some of the distinctive features. The garden is grazed by annual cuttings that are shortened to 2/3 of their length. The feeding area will be larger 5x4 m than pomegranate. The pomegranate Bush is given a shape in the form of a low-bodied tree that reaches 30-40 cm in height. Above the body, 3-4 main branches are left, from which branches of the second and subsequent order are formed. If the pomegranate Bush is given this uniform shape, it will be convenient to bury it in winter. When the main branches become overextended, the fig Bush also becomes larger and consequently the work of burying and opening the Bush becomes more difficult.

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MORPHOLOGICAL CHANGES IN LYMPH NODES VESSELS OF THE SMALL INTESTINE OF DOGS WITH OBSTRUCTED LYMPH DRAINAGE

Abstract: *One of the main ways of nutrient absorption in the small intestine is, as is known, its interorgan lymphatic system, from which lymph is diverted to the extracorporeal milk vessels. The extra organ milk vessels of the human small intestine, located in the mesentery, are formed from the diverting lymphatic vessels of the submucosa and the diverting lymphatic vessels of the serosa. They follow from the mesenteric edge of the small intestine to the main lymph nodes of the mesentery root together with or separately from the blood vessels, terminating in numerous mesenteric lymph nodes.*

Key words: *dog, small intestine, extra organ lymph nodes, lymph vessels, abdominal cavity, lactic vessels, mesenteric node.*

Introduction. One of the primary pathways for nutrient absorption in the small intestine is its intraorgan lymphatic system, from which lymph is drained into extraorgan chylous vessels [1,3]. The extraorgan chylous vessels of the human small intestine, located in the mesentery, are formed from the efferent lymphatic vessels of the submucosal layer and the serous membrane [2,4,5]. These vessels extend from the mesenteric border of the small intestine to the main lymphatic nodes at the root of the mesentery, either alongside blood vessels or independently, interrupted by numerous mesenteric lymphatic nodes.

Research Objective. The purpose of this study is to investigate the morphology of the chylous vessels of the dog's small intestine under conditions of lymph stasis induced by ligation of lymphatic vessels at various levels.

Materials and Methods. The study involved 23 animals (dogs), including 3 controls. Four series of experiments were conducted on experimental animals to induce impaired lymph outflow.

In the first series, the thoracic lymphatic duct was ligated near its entry into the left venous angle in 5 dogs.

In the second series, the intestinal trunk was ligated at the origin of the cranial mesenteric artery in 5 dogs.

In the third series, 5 dogs underwent two operations: first, the thoracic lymphatic duct was ligated in the neck, followed by ligation of the efferent lymphatic vessels of the cranial mesenteric node 4, 5, 7, 10, or 15 days later.

In the fourth series, the afferent lymphatic vessels of the cranial mesenteric node were ligated at their entry into the node in 5 dogs. Experimental animals were euthanized 1, 3, 5, 7, 10, or 15 days post-operation.

Results. The study revealed that in 5 dogs of the first series and 5 dogs of the third series, dilated chylous vessels (1.5–2 times larger) were clearly visible in the wall of the small intestine and its mesentery 2–7 days post-operation. The number of these vessels significantly increased in both the jejunum and ileum compared to the norm, likely due to the expansion of reserve lymphatic vessels. A network of lymphatic vessels in the serous membrane was clearly visible along the length of the small intestine, with loops of varying shapes oriented nearly perpendicular to the intestine's long axis. Collecting lymphatic vessels formed from this network, merging in pairs and crossing the intestine transversely, reached its mesenteric border and entered the mesentery, where they anastomosed with each other and with efferent lymphatic vessels.

First Series Results:8–15 days post-operation, the condition of the extraorgan lymphatic vessels of the small intestine and its mesentery in other dogs of this series was similar to that described above. However, the diameter of the lymphatic vessels slightly decreased, and areas of the mesentery free of vessels showed varying degrees of opacity due to connective tissue proliferation. In all dogs of this series, the lymphatic vessels of the cranial mesenteric node were sequentially studied in the direction of lymph flow toward the vein. The efferent lymphatic vessels of the cranial mesenteric node were numerous. Five dogs were euthanized, while in another 5, well-filled efferent lymphatic vessels of the cranial mesenteric node were ligated and left for further study.

Second Series Results: In 3 dogs, incomplete ligation of the intestinal trunks was performed due to undetected additional intestinal trunks. Consequently, no visible morphological changes were observed in the lymphatic vessels of the small intestine wall or its mesentery 7, 10, or 15 days post-operation. In a dog euthanized 5 days post-operation, injection of Gerota's mass into the lymphatic vessels of the small intestine wall showed incomplete filling of the mesenteric lymphatic vessels. The efferent lymphatic vessels of the cranial mesenteric node formed a bundle directed cranially, either entering the cisterna chyli directly or passing through the pancreaticoduodenal node. The intestinal trunks were obliterated from the cranial mesenteric node to the ligation site.

Third Series Results: This series aimed to further investigate the condition of the extraorgan lymphatic vessels of the small intestine in 5 dogs from the first series, where the thoracic lymphatic duct was initially ligated, followed by ligation of the efferent lymphatic vessels of the cranial mesenteric node 4, 5, 10, or 15 days later.

Five to seven days post-operation, severe engorgement of the lymphatic vessels in both the small intestine wall and its mesentery was observed, along with vessel deformation, tortuosity, increased vessel count, and some thickening and hardening of the intestinal wall. Collecting lymphatic vessels of the serous membrane were primarily formed at the free edge of the intestine, crossing it as dense white cords into which lymphatic vessels from the intestinal wall drained.

Near the obliterated intestinal trunks, numerous small and large efferent lymphatic vessels of the cranial mesenteric node were found, some significantly dilated, forming a plexus on the posterior abdominal wall that partially compensated for lymph outflow. Some efferent lymphatic vessels, filled with blue mass, extended cranially and either entered the cisterna chyli directly or were interrupted in the pancreaticoduodenal nodes. Others extended caudally toward the aortic or lumbar lymphatic nodes behind the inferior vena cava.

Fourth Series Results:In 5 dogs, the afferent lymphatic vessels of the cranial mesenteric node were ligated at their entry into the right and left halves of the node. Three to five days post-ligation, severe stasis of chylous fluid was observed in these vessels. Dilated arcades of lymphatic vessels at the mesenteric border connected the lymphatic vessels of adjacent neurovascular bundles in the mesentery. By day 7 post-operation, expansions resembling chylous “lakes,” connective tissue proliferation, and mesenteric opacity were observed along the lymphatic vessels. Due to wall thickening and reduced lumen, the lymphatic vessels felt dense and were tortuous. The small intestine wall in these animals Kierkegaard animals was edematous and hardened.

Conclusion. Simultaneous ligation of large and small efferent lymphatic vessels of the cranial mesenteric node significantly affects the extraorgan lymphatic vessels of the small intestine, resulting in increased number and diameter of efferent lymphatic vessels, thickening and hardening of the lymphatic vessel walls and the intestinal wall, enlargement and hardening of the cranial mesenteric node, and, in some cases, small hemorrhages and ulcerations of the intestinal mucosa. These changes in the extraorgan lymphatic vessels of the small intestine and its mesentery may occur due to lymphatic vessel and node obstruction by malignant tumor cells or other pathological processes.

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CYTOMORPHOLOGICAL ANALYSIS OF SECRETORY ACTIVITY IN NEURODYSTROPHIC PROCESSES IN THE LIVER

Abstract: *The article studies the differential analysis of tissue changes in the liver that occur in it with various types of denervation. To study the secretory activity of the denervated liver, experimental and intact animals were always killed at the same time of day - at 9-10 am, after a preliminary 24-hour fast. Denervation of the liver only limits the regulatory effect of nerve impulses on the liver parenchyma, causing a disorder of the entire secretory activity of hepatocytes.*

Key words: *cats, liver, denervation, hepatocytes, nerve transection, experiment, biliary pole, bile acids, Golgi apparatus.*

Introduction. In an intact organism, a glandular cell functions as part of a whole. At the same time, like any other somatic cell, the glandular cell is an integrated system, meaning it cannot develop, function, or reproduce without any of its components [2,3]. Understanding the mechanisms of central regulation of intracellular regulatory systems is of great theoretical and practical interest and remains relevant at the current stage of scientific research [1,4]. Selective disruption of the afferent or efferent components of the reflex arc can serve as one of the possible methods to elucidate their role in the structural and functional organization of glands [5].

Study Objective. The object of study in this work was the denervated liver in an experimental setting.

Materials and Methods. The experimental animals used were male domestic cats. All experimental and intact animals were housed in a vivarium and maintained on a standard mixed diet. After surgical intervention, experimental animals were euthanized at various time points, ranging from 1 week to 6 months, always between 9–10 a.m. following a 24-hour fasting period. Control operations involved opening the spinal canal or abdominal cavity without subsequent nerve transection or removal of nerve ganglia. The secretory activity of hepatocytes in intact animals was studied at different time points after feeding and at various times of the day. A total of 20 operated and approximately 10 intact animals were examined. Tissue samples from the organs of intact and operated animals were analyzed using cytological, histochemical, and biochemical methods.

Results. The secretory activity of hepatocytes is manifested in their production of both protein (plasma proteins, enzymes secreted with bile) and non-protein (bile acids, plasma phospholipids, cholesterol) secretory products. Additionally, unlike muscle cells, hepatocytes can freely absorb glucose from the

blood and store it in their cytoplasm as glycogen granules. The liver, as a digestive gland, functions through the biliary pole of hepatocytes by secreting bile acids, alkaline phosphatase, and small amounts of other enzymes into the duodenum. Through their vascular pole, hepatocytes receive raw materials from the blood and release finished secretory products back into the bloodstream. It is in this region of the liver lobules that complex structural and functional relationships between the circulatory system and the vascular pole of hepatocytes are established. Our data indicate that cellular organelles are involved in the secretion of bile acids. Biochemical data show that structural changes in mitochondria and their movement within the cell during different phases of bile acid secretion suggest that mitochondria not only provide the bioenergetic support for bile formation but also participate directly in bile acid secretion. To study the secretory activity of the denervated liver, both experimental and intact animals were euthanized at the same time of day (9–10 a.m.) after a 24-hour fasting period. In intact animals, during these hours, most cells in the liver lobules are filled with secretory granules (the phase of bile acid accumulation). In mixed denervation (removal of celiac plexus nodes or transection of vagus nerves), the degree of impairment in liver secretory activity depends on the extent of denervation. The most extensive denervation in our experiments was achieved by removing the semilunar nodes of the celiac plexus or simultaneously removing the celiac and superior mesenteric plexus nodes and transecting both vagus nerves below the diaphragm. However, despite vascular disturbances in the liver with mixed denervation, glycogen never completely disappears, although its levels typically decrease. In contrast, with deafferentation of the liver, hepatocytes completely lose their ability to accumulate glycogen. Mixed denervation results in more extensive necrotic foci in the liver compared to pure deafferentation. In the preserved areas of the lobule parenchyma, some hepatocytes retain secretory activity, while others show clear signs of impaired secretory processes. Structural changes in cellular organelles are also observed: the Golgi apparatus becomes significantly hypertrophied, bile canaliculi appear dilated and fragmented in many places, and small amorphous areas are found in some hepatocytes. Biochemical analysis of plasma proteins (albumins and globulins) using paper electrophoresis revealed a sharp decrease in total serum protein two weeks after liver denervation, primarily due to a reduction in the albumin fraction. Five months after mixed denervation, there was a tendency toward normalization of the levels of various protein fractions in the serum. Thus, the experimental data presented in this study indicate that even partial denervation of the liver, which only limits the regulatory influence of nerve impulses on the liver parenchyma, disrupts the entire secretory activity of hepatocytes. Our experiments clearly distinguish the effects of pure deafferentation of the liver from mixed denervation. In the latter case, the overall pattern of denervation changes is compounded by intensified vascular and circulatory disturbances due to complete vascular denervation. Liver denervation triggers a series of chain reactions that underlie all physiological mechanisms of the organism and ensure the interaction of its various parts. To understand the complex interplay of factors affecting the secretory activity of

denervated hepatocytes, we briefly consider the main changes observed in liver denervation. Deafferentation of the liver was achieved in our experiments by removing spinal ganglia. We noted that deafferentation leads to the loss of hepatocytes' ability to absorb glucose and store it as glycogen granules. In intact fasted animals, glucose induces the synthesis of glucokinase in the liver, whereas in fasted animals with denervated livers, glucose does not affect the reduced activity of this enzyme. Fasting induces the synthesis of glucose-6-phosphatase in a normal liver but does not produce this effect in a denervated liver. Similarly, insulin administration restores glucokinase synthesis in the liver of diabetic organisms, but in denervated livers, insulin does not alter the reduced activity of this enzyme. In our experiments, the glycogen storage function of hepatocytes did not recover even six months after deafferentation. In other words, hepatocytes denervated in the sensory aspect lose their ability to respond to many external factors, including hormonal ones. It should also be considered that impaired glucose metabolism in the liver alters the intracellular energy resources of hepatocytes, ultimately leading to disrupted ATP synthesis in their mitochondria. It can be hypothesized that impaired ATP synthesis alters the conformational state of proteins in mitochondrial membranes. Our experiments clearly demonstrate the dynamics of structural and functional impairments in the mitochondrial apparatus of denervated hepatocytes.

Conclusion. In the later stages of deafferentation, a reduction in the number of mitochondria in liver cells is observed, and in some hepatocytes, mitochondria disappear entirely. In the early stages of denervation (two weeks post-operation), hepatocytes are notably overloaded with secretory granules, which often appear swollen with blurred contours. Sometimes, these granules merge into large fuchsinophilic conglomerates interspersed with vacuoles of varying sizes. One and three months after deafferentation, the number of secretory granules and mitochondria in hepatocytes is significantly reduced, and in some cells, they disappear completely.

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EPIDEMIOLOGY OF THE ENTRY OF COVID-19 INTO THE SAMARKAND REGION

Annotation. *The mass spread of any infectious disease among the population is characterized by the conditions that determine its occurrence and development, as well as the intensity, composition, and dynamics of its spread. By observing and recording these manifestations, initial hypotheses are formed about the causes of the occurrence and spread of the disease. Comparison and analysis of various indicators characterizing the manifestations of the spread allow us to draw conclusions about the verification - confirmation or rejection of the formed hypotheses. After a certain idea is formed about the determinants of the spread of COVID-19, that is, the reasons for the emergence and spread of this disease from abroad in a particular region, a decision is made to organize and implement specific diagnostics of the disease, treatment and preventive measures, based on the existing infrastructure and capabilities of the healthcare system.*

Key words; *COVID-19, epidemiology, prevention, quarantine-restriction.*

Relevance of the problem. According to the results of the study of the epidemiological significance of the introduction of Covid-19 into the Samarkand region [1,3], the first cases of infection with this disease in the region began to be observed in the first ten days of April 2020 among citizens of the city of Samarkand and Tayloq district returning from foreign countries as an “exotic” disease - an imported disease, and the disease continued to be registered among the population until December of this year [2,5,6]. During the epidemic period, that is, from April to December 2020, a total of more than 2,500 people were diagnosed with COVID-19 in the region [4,7.8].

Research material and methods. Analysis of the dynamics of COVID-19 cases shows that in April (45 cases) 1.8% of the total number of cases was recorded, while in May (280 cases) there was a sharp increase in the number of cases - 6.2 times compared to April. In June (178 cases), a slight decrease in the number of cases was recorded - 1.57 times compared to May. However, in July, a sharp increase in the number of cases was observed again, that is, a 3.39-fold increase compared to June and amounted to 604 cases, which is 13.42 times higher than in April. High rates of the disease remained stable in August (670 cases) and September (550 cases). Of the total number of cases (2327 cases) recorded during the epidemic period, the absolute majority (1824 cases) were recorded in July-September.

To comprehensively assess the impact of quarantine and restriction measures on the intensity of the disease, COVID-19 cases were analyzed for 5 days of each

month. As soon as the first case of COVID-19 was registered in Uzbekistan (March 15, 2020), mass events, air travel with foreign countries (March 16, 2020), and rail travel (March 19, 2020) were suspended, and the scope of restrictions was quickly expanded and the first strict quarantine was established (March 30, 2020 - May 8, 2020). As a result of these measures, the first wave of infection in Samarkand region was eliminated by the end of May - almost two months later. In the first two 5 days of June, no cases of COVID-19 were recorded in the region. The interruption of the chain of the COVID-19 epidemic process in the first 10 days of June can be directly assessed as a positive effect of strict quarantine measures. However, starting from the third five days of June, that is, a month after the easing of quarantine measures, COVID-19 infections began to be observed again in the region as a second wave of infections, the highest level of infections was recorded in the second ten days of July, and in general, this situation was similar to the epidemic situation observed in most regions of the republic. Therefore, a second strict quarantine was introduced in the republic from July 10 to August 11. Despite this, the second wave of COVID-19 infections in the Samarkand region lasted from the third five days of June to the fourth five days of October - exactly four months. The conducted analyses show that quarantine and restrictive measures are effective in controlling the COVID-19 epidemic process, but have a relative impact, that is, with the easing or cessation of this set of measures, the incidence of the disease will begin to increase again. This manifestation of the spread of the disease (in general, or rather, the epidemic process) is a natural phenomenon for exotic diseases transmitted by airborne droplets, including COVID-19. The fact that the second wave of COVID-19 infection is more intense and lasts more than twice as long as the first wave is explained by the fact that over time, after the introduction of the disease from abroad, the number of sources of infection among the population increases and the nosocomial area expands. This situation may also be partly due to the decrease in the level of compliance of the population with the next quarantine and restriction requirements - the population's "fatigue" from quarantine and restriction measures.

Results and discussion. In order to clarify the level of reliability, the data obtained were analyzed. This analysis shows that the relative risk of COVID-19 infection among residents of “urban” areas is 1.9 times higher (RR=1.9) than among residents of “suburban” areas. The above data indicate that cities are a “risk zone” for the spread of COVID-19, and residents of cities and suburban areas, according to the level of morbidity, belong to the “risk group”. This difference in the intensity of the spread of the disease (epidemic process) is explained, first of all, by the different population densities in cities and areas, in particular, the higher population density in cities. In this case, of course, the population density is affected not only by people registered in the city, but also by regular visitors to cities from neighboring regions for work, education, commerce, medical services, household chores and many other activities - there are many factors that affect the "pendulum-like oscillation" of the city's population, and these factors should not be ignored. At the same time, in our opinion, it should be taken into account that for all "exotic", that is, infectious diseases that enter from outside, in most cases, they are initially

brought to administrative centers and spread radially from this place to the surrounding areas. COVID-19, as an "exotic" infectious disease, was initially recorded precisely in the administrative center - the city of Samarkand and in the adjacent Tayloq district, and from these areas to the surrounding areas, radially, away from the center, was observed. The concentration of administrative, social, industrial, educational, commercial, healthcare, and many other facilities in the city, in addition to affecting population density, also contributed to the spread of the disease throughout the region through those who applied to these facilities from the districts (or those who worked in them from the districts).

It is worth noting that all study participants were treated in inpatient settings, and that the treatment of patients in hospital settings is often determined by the manifestation and severity of clinical symptoms of the disease. That is, the presented morbidity indicators may reflect not only the intensity of the epidemic process, but also indirectly the severity of the disease.

In our opinion, the significantly lower incidence rate in children under 14 years of age compared to the average is consistent with the general trend in the age distribution of COVID-19 cases observed worldwide in 2020 and can be explained, first of all, by the initial state of the organism (before infection) and the pathogenetic mechanism of the disease. Differences in the incidence of age groups over 15 years of age were manifested, first of all, in proportion to the differences in the social activity of people in a particular age group. As a result of the analysis, it was found that members of the 15-49 age group belong to the risk group in terms of disease transmission. In the age group over 50, although the frequency of age-related factors leading to the manifestation and clinical exacerbation of the disease is higher, due to the introduced quarantine and restrictive measures, their social activity has decreased and the frequency of communication has decreased, the incidence rate in these groups has been reliably lower than the average among the population. This proves the effectiveness of the recommended quarantine and restrictive measures, such as maintaining social distance, wearing masks, and isolation.

It is important to analyze the incidence rate in different social groups of the population in order to determine the reasons for the differences in the intensity of the epidemic process among individuals of the same age group. Analysis by socio-professional groups shows that the lowest incidence rate of COVID-19 was recorded in the group of preschool children (11.5±3.4 per 100,000 people).

This indicator is 5.5 times lower than the average incidence rate of the general population (62.9), that is, significantly lower ($r<0.05$). At the same time, it is worth noting that the incidence of children belonging to organized communities in this group (17.5±2.5) is 2.6 times higher ($r<0.05$) than the incidence of unorganized children (6.8±1.4). Compared to the average incidence of the population, the incidence of children in organized communities is 3.6 times lower, while the incidence of children in unorganized communities is 9.3 times lower.

It is one of the laws inherent in the epidemiology of diseases transmitted by the airborne mechanism that individuals of the same age group (including children) differ in their level of morbidity depending on their non-union and belonging to an

organized community. All other things being equal, the incidence of infections transmitted by the airborne mechanism is necessarily higher among members of an organized community than among unorganized ones, and this is explained by the activation of the transmission mechanism in accordance with the grouping of people. In particular, the activation of the airborne transmission mechanism is determined by many factors, such as the duration of people's stay and communication inside the building, the number of people in the building, the level and volume of the room per person, the distance between people, the nature of ventilation.

Conclusions: Two waves of the intensity of the COVID-19 epidemic process were observed in Samarkand region in 2020. The second wave of the disease was more intense and longer than the first wave. The wave-like course of the intensity of the COVID-19 epidemic process is determined by the presence and extent of the conditions for transmission of the infection, that is, as a result of strict quarantine restrictions, the incidence decreased to a certain extent, and after the relaxation of these measures, it manifested itself in the form of a second wave. This manifestation of the epidemic process is natural for “exotic” diseases transmitted by the airborne mechanism, including COVID-19. The fact that the second wave of COVID-19 infection was more intense and lasted more than twice as long as the first wave is explained by the increase in the number of sources of infection among the population and the expansion of the nosocomial area over time after the introduction of the disease from abroad.

Analysis of the COVID-19 epidemic process showed that high rates of infection were recorded in July-September (“dangerous time”), in cities and peri-urban areas (“risk zones”), and among males, in the 15-49 age group, and among members of organized communities (“risk groups”). In particular, among members of organized communities, the incidence of infection among medical workers, civil servants, school and lyceum teachers, and college and university teachers is significantly higher than the average incidence of the population.

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THE ROLE OF MOVEMENT GAMES IN THE FORMATION OF MORAL AND VOLITIONAL QUALITIES IN PRESCHOOL CHILDREN

Abstract: *This study investigates the pedagogical potential of movement games in shaping moral and volitional qualities in preschool-aged children. The preschool period is critical for the development of personality traits such as responsibility, perseverance, honesty, discipline, and self-control. Based on theoretical analysis and practical interventions in preschool institutions, this paper demonstrates that movement games, when properly organized, contribute significantly to the social-emotional, moral, and volitional development of children. The research combined observational, experimental, and interview-based methods over a 4-week intervention program involving 50 children aged 4–6. The results provide strong evidence supporting the integration of movement games into the preschool curriculum.*

Keywords: *movement games, preschool children, moral development, volitional qualities, physical activity, character formation, early education*

1. Introduction

In the early years of life, children begin to develop not only their cognitive abilities but also fundamental moral and volitional traits that shape their personalities. The preschool age is a formative period during which children learn to follow rules, regulate their behavior, and cooperate with others. These competencies are essential for social adaptation and long-term academic success.

While academic and cognitive skills are often emphasized in early education, recent research underlines the importance of integrating play-based activities—particularly movement games—into preschool programs. Movement games are structured physical activities that incorporate elements of fun, rules, and interaction. These games offer rich opportunities for children to experience concepts such as fairness, persistence, patience, and mutual support in action.

In the context of preschool institutions, movement games are not only a tool for physical development but also a platform for shaping children's internal moral compass and volitional strength. This study aims to explore how systematically organized movement games can contribute to the formation of these traits in preschoolers.

2. Methods

2.1. Participants

The study was conducted at three preschool institutions in Tashkent region. A total of 50 children (26 boys and 24 girls) aged between 4 and 6 years were selected. Five educators and 20 parents were also involved in the study for data triangulation.

2.2. Research Design

The research employed a quasi-experimental design combining pre-test and post-test evaluations, direct observation, and qualitative interviews.

2.3. Instruments and Data Collection

Behavioral Observation Protocol: Used to assess moral and volitional behaviors during and after movement games.

Educator Interviews: Semi-structured interviews with five preschool teachers were conducted to gain insights into behavioral changes.

Parent Questionnaires: Parents completed a checklist on children's behavior at home before and after the intervention.

Pre-Post Assessment Tool: A 5-point scale was developed to evaluate changes in cooperation, patience, rule-following, responsibility, and perseverance.

2.4. Intervention

For 4 weeks, children participated in movement games 4 times per week, each lasting 30–40 minutes. The games were designed to:

Encourage teamwork and collaboration (e.g., "Tunnel Relay", "Build the Tower Together")

Promote rule-following and fairness (e.g., "Red Light, Green Light")

Stimulate persistence and problem-solving (e.g., "Obstacle Course Adventure")

Enhance self-regulation (e.g., "Freeze Dance", "Simon Says")

Educators were trained in advance to observe and support the development of targeted qualities during the games.

3. Results

3.1. Quantitative Outcomes

After four weeks, children showed statistically significant improvements in the following areas:

Behavioral TraitImprovement Rate (%)Cooperation+78%Patience and Turn-taking+62%Rule-following+71%Responsibility+66%Perseverance+69%Reduction in conflict–48%

These results were consistent across all three institutions, indicating the effectiveness of the program regardless of socio-economic or cultural background.

3.2. Qualitative Observations

Educators noted several positive behavioral patterns:

Children began to remind peers of rules and encouraged fair play.

More children volunteered for leadership roles in team activities.

Children showed increased ability to manage frustration after losing a game.

Instances of aggression, crying, and quitting decreased noticeably.

Parents reported similar improvements at home, especially in areas of discipline, cooperation with siblings, and responsibility in tasks like tidying toys or following bedtime routines.

4. Discussion

The findings support the hypothesis that movement games are a powerful means for instilling moral and volitional traits in young children. These games

provide a structured but emotionally engaging context where values such as honesty, fairness, responsibility, and self-control can be practiced in real-life situations.

The repetition of these games over several weeks allowed children to internalize positive behaviors. This aligns with L.S. Vygotsky's theory, which asserts that play is a leading activity during preschool years and plays a crucial role in the development of self-regulation and higher mental functions.

Furthermore, the cooperative and rule-based nature of movement games helped children understand the importance of respecting others and controlling their impulses. This is consistent with Bandura's social learning theory, which emphasizes that behavior is learned through observation and imitation in social contexts.

The study also highlights the role of the educator as a facilitator and moral guide during games. Proper organization, consistent reinforcement of values, and reflective discussion after playtime contributed significantly to the outcomes.

5. Conclusion

Organized movement games, when purposefully integrated into preschool education, serve as an effective medium for developing key moral and volitional qualities in children. These games enhance social skills, emotional control, and character formation, all of which are foundational for later success in school and life.

Preschool educators should receive training in the intentional use of movement games, and educational institutions should consider allocating more time and resources to this aspect of the curriculum. Future research can further explore long-term impacts and differences across cultural or developmental contexts.

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STUDY OF THE LANGUAGE, STYLE, AND TERMINOLOGY OF ENGLISH TEXTS RELATED TO TECHNICAL FIELDS

Abstract. *In the modern era of globalization and rapid technological advancement, the role of English in technical communication has become increasingly vital. This article explores the distinctive language features, stylistic elements, and specialized terminology found in English texts across various technical domains. Emphasis is placed on how these linguistic components contribute to clarity, precision, and functionality in scientific and engineering discourse.*

Key words: *Technical English, formal language, domain-specific vocabulary, terminology, engineering communication, passive voice, structure, consistency, teaching technical vocabulary, lexis competence.*

Introduction. English has long served as the global lingua franca of science, engineering, and technology. Whether in academic publications, user manuals, software documentation, or engineering specifications, the language of technical fields is characterized by its formal tone, unambiguous structure, and domain-specific vocabulary. Understanding the linguistic and stylistic features of these texts is essential for students, engineers, translators, and educators involved in technical communication.

Technical English differs significantly from general English in several ways:

1. **Precision and Clarity**. One of the most important features of technical texts is their commitment to clarity and precision. Unlike literary or informal writing, which may use figurative language, emotional expressions, or vague descriptions, technical writing must convey information in a direct and unambiguous way. This is especially critical in scientific and engineering contexts, where misunderstanding can lead to serious errors. For example, a phrase like “a lot of pressure” is too vague for technical communication. Instead, a precise measurement such as “85 psi (pounds per square inch) of pressure” provides an exact and universally understood value. This level of specificity helps ensure that instructions, specifications, and analyses are interpreted consistently by all readers, regardless of their background or location.

2. **Impersonal Style**. The passive voice is frequently used to emphasize the process rather than the person performing it. For instance: *"The circuit was tested under controlled conditions."* rather than *"We tested the circuit."*

3. **Nominalization**. Nouns are often used in place of verbs to maintain objectivity and formal tone. Example: *"The installation of the software..."* instead of *"Installing the software..."*

4. **Use of Numbers and Units**. Technical writing heavily relies on numerical data and measurement units (e.g., kW, GB, mm). Accuracy is paramount.

The style of technical English is typically:

- **Formal and Objective**: No contractions (e.g., *do not* instead of *don't*), no idioms, and limited emotional expression.
- **Structured**: Organized using headings, bullet points, tables, and diagrams to support understanding.
- **Consistent**: Terminology, abbreviations, and formatting follow industry standards (e.g., IEEE, ISO, APA).

Terminology in Technical English

Technical texts use domain-specific vocabulary that may not appear in general English. For example:

- ✓ In **Computer Science**: *algorithm, compile, bandwidth, encryption*
- ✓ In **Mechanical Engineering**: *torque, piston, tensile strength, lubrication*
- ✓ In **Electronics**: *resistor, diode, circuit board, voltage regulator*

Terminologies are often standardized within disciplines to ensure mutual understanding across borders and languages.

Implications for Teaching and Learning

Developing lexis-oriented competence in technical English requires:

- Exposure to authentic texts such as scientific articles, technical manuals, and patents.
- Practice with glossaries, word lists, and dictionaries tailored to specific disciplines.
- Focused instruction on prefixes, suffixes, and root words common in scientific terminology (e.g., *-meter, auto-, trans-*, etc.).
- Integration of corpus-based tools to analyze frequency and usage of technical terms.

Conclusion. A solid understanding of the language, style, and terminology of English texts in technical fields is crucial for effective communication in today's interconnected scientific and technological communities. Mastery of technical English not only facilitates academic success but also enhances professional collaboration and innovation across international boundaries.

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THE USE OF DIGITAL TECHNOLOGIES IN LIGHT INDUSTRY ENTERPRISES

Abstract. *The article covers the issues of developing the organization of production based on digital technologies in industrial enterprises, analyzes existing problems in this field, studies the factors hindering digitalization processes, and describes the directions of digitalization of production. Features of modern digital production systems are revealed.*

Keywords. *production process, digital economy, digital technology, automation, software, artificial intelligence, smart enterprise, blockchain.*

Introduction. In modern conditions, the digitalization of economic processes and information technologies is penetrating into all spheres of activity. The new development strategy of Uzbekistan for 2022-2026 also plans to make the digital economy the main "driver" of economic development and increase its volume by at least 2.5 times. The task is to increase the volume of software production by 5 times, their exports by 10 times to 500 million dollars. To fulfill these tasks, large-scale measures have been outlined to widely introduce and support the digital economy, and as part of these tasks, new electronic document management systems are being introduced in the country, electronic payments are developing and the regulatory framework in the field of electronic commerce is being improved, electronic infrastructure and commerce are being formed, digital technologies are being introduced in all areas of the economy. Moving to transformation step by step is a step in the process.

With the introduction of digital technologies into production processes, new requirements are being placed on the sources of competitive advantage of enterprises, on effective concepts of their functioning and management. Taking into account the specifics of the transition to the digital economy, forecasting possible problems, as well as developing solutions and proposals to minimize negative consequences are becoming the main condition for organizing the company's activities. An important aspect of achieving competitive advantage is the system of effective management of available resources and business processes in industrial enterprises, based on innovative technologies and methods of optimizing business processes.

Literature review. Digital technologies are a part of our lives today and are widely used in practice in various fields. Several scientists expressed their opinion about digitization in the manufacturing process.

The term "digital economy" was first used in 1994 by Canadian economist Don Tapscott. In his work, the author talked about the impact of digitalization on the economy. He considered the reduction of transaction costs and the emergence

of completely new business models to be one of the main advantages of digitalization.

V.A. In his research, Plotnikov defined digitization as "a modern stage in the development of informatization, characterized by a combination of a new device and software, characterized by the widespread use of digital technologies for the creation, processing, transmission, storage and visualization of information." He also lists several advantages that businesses receive when using digital technologies.:

- the flexibility of production increases due to its rapid restructuring, dynamic changes in the characteristics of the production process, which creates a competitive advantage and leads to an increase in potential profits.;

- provides information integration of product lifecycle stages from development to disposal, which allows us not only to optimize production, but also to effectively and comprehensively address issues of quality, environmental safety, creation of new business opportunities, etc.

Brynjolfsson and Priests (2002) first promoted the digitization of the economy as a topic of discussion in the mid-1990s, providing the first definitions recognized in these definitions as a means of meeting businesses and consumers in virtual worlds.

With the development of digitalization, the company's business models are constantly changing. Therefore, many authors interpret the definition of digitization in different ways. For example, Alexander Kutsman characterizes the digital economy as "a modern type of economy characterized by the priority role of information and knowledge based on the active use of digital technologies to identify, store, and process resources in the production of tangible products and services." Aksenov R. K. He argues that the digital economy is based on the production of electronic products and e-commerce services. Aksenov R. under e-commerce. The electronic movement of capital and electronic products also implies the process of electronic information exchange.

Issues such as the effective use of new information technologies in various sectors of the national economy, methods of introducing digitalization systems into them, principles of digital modeling based on new information systems, evaluation of the effectiveness of using automated information systems in corporate governance, their control, and conditions for the development of the digital economy are reflected in Kabulov's scientific research (1998).

E.In Muminova's study, studies were conducted on the effectiveness of using blockchain technologies in the development of the country's industry, the importance of electronic commerce and electronic contracts in enterprise cooperation. Openness as a result of the ongoing reforms in Uzbekistan, the development of international economic and political ties have created opportunities for modernization, technical and technological re-equipment of industries in the country. As you know, the digital economy also plays an important role in creating added value today. As a result of the ongoing reforms in the sectors of the economy,

the processes observed on the basis of the impact of digital information acquire a key decisive force in the strategic development of industrial enterprises.

Decree of the President of the Republic of Uzbekistan dated October 10, 2020 No. PF — 6079 On the approval of the strategy "digital Uzbekistan-2030" and Measures for its Effective Implementation also noted that the following activities will be carried out in order to develop digital technologies in the real sector of the economy:

-S ensuring automation and management of all stages of the enterprise's supply chain, as well as reducing logistics and procurement costs due to this;

-S improving the quality of products and services through the introduction of modern information systems and software products, reducing their cost, production shutdowns, and increasing the transparency of financial and economic activities;

-C Improving the regulatory framework for the introduction of innovative automated control systems and software products;

-Step-by-step automation of workplaces and robotization of production processes, as well as the introduction of artificial intelligence technologies;

-S improving the mechanisms of interaction with customers (clients) in order to increase sales and improve customer service;

-C Improvement of the management information acceptance support system, including the implementation of a real-time business analysis system;

-S to increase the share of large business entities that have implemented an enterprise resource management system (shp) to 90% in 2025;

With the transition of the economy to a new technological stage, there is a need to modernize the country's production structures, organizational and economic support for production processes, and the formation of modern approaches to management methods. In the context of deepening economic reforms, the processes of automation and robotization of production at industrial enterprises, the introduction of advanced methods and techniques of production organization, and increasing the level of its digital intellectualization are rapidly developing. Modern approaches to the organization and management of production are based on a complete exchange of information, reducing the number of workers and employees in a short time, increasing their competence, and introducing flexible production systems and robotic complexes. To do this, it is necessary to pay attention to the development of innovative, high-tech production. In the field of digital production, such modern trends as the "industrial Internet of things", "additive manufacturing technologies", "cloud technologies", "artificial intelligence", and "intelligent robotic manufacturing" are developing, and the organization uses simulation and economic mathematical modeling in decision-making. The following advantages and risks of digital transformation of industrial enterprises can be cited.

Pros and cons of risks

New breakthrough digital technologies, artificial intelligence, industrial Internet of things, big data analysis, dependence on borrowed imported

technologies, violation of one's own competence, the presence of hidden "bookmarks" in hardware and software

New sales markets, business models, innovative productions, media services the risk of rapid capture of innovative markets by companies in economically developed countries.

Growth of labor productivity, production efficiency, automation, robotization, job cuts, termination of some special jobs, unemployment, social conflicts

Increased efficiency and standardization of services, exclusion of intermediaries, uberization of transport, medicine, education, services, legal uncertainty, increased fraud, ethical issues, social stratification

In modern conditions, the organization of production is considered as a process of effectively combining highly qualified personnel (workers) with the necessary competencies with innovative tools and products of labor in a certain environment and at a certain time, based on the digitalization of product lifecycle management.

In our opinion, digitalization of production is hindered by such factors as the fact that enterprises continue to use outdated technologies (64%), the lack of specialists with certain experience, knowledge and skills (61%) and weak integration links between new technologies (62%). According to the results of research in the field of digital transformation of production, enterprises using digital technologies and management methods receive 26% more profit than their competitors. The financial results of enterprises that pay little attention to management with sufficient investment in digital technologies are 11% lower, and due to the modernization of the management process, only 9% of additional income can be obtained.

The current economic situation with the beginning of the fourth industrial revolution

is characterized. As part of this revolution, digitized "smart" enterprises are being created. Such enterprises provide an opportunity to produce products that are competitive in the domestic and foreign markets. But the process of large-scale introduction of digital technologies into production processes at industrial enterprises operating in our country today is unsatisfactory. The following circumstances prevent this:

- the lack of a legislative framework governing the new economic order, or its inconsistency with the technological changes taking place at the present stage;
- the emergence of new technologies, objects and subjects of economic relations, the rapid growth of information, which has become a form of capital
- insufficient training of qualified personnel, lack of human capital;
- large amounts of data create large information flows and risks associated with ensuring information security during data transmission, processing and storage;
- the lack of financial resources of the enterprise and the high cost of projects aimed at digitalization of the industry;

- the conservative nature of individual industries. Little attention is paid to these processes, knowing that the widespread use of digital technologies opens up new opportunities for enterprises.

Developing an effective approach to managing business processes and new technologies in an enterprise is not an easy task. The application of innovative management theories and methodologies is required to ensure the sustainable development of an industrial enterprise. The processes taking place in an enterprise require constant attention from management, process owners, and staff involved in the implementation of business processes. In the process of process improvement and optimization, it is necessary to maintain the level of efficiency and progress achieved as a result of the implementation of the process approach. The modern method of the digital economy is characterized by the development of a new generation of enterprise management concepts. These concepts are characterized by processes such as industrial robots, uncontrolled transport, the use of software-based equipment for digital control, the use of 3D printers, storage of large amounts of data in cloud technologies, artificial intelligence, the industrial Internet of Things (Internet of Things, IoT), innovations in blockchain, simulation and mathematical modeling and forecasting., cybersecurity.

When implementing the algorithm of the digital transformation process of an enterprise, depending on the chosen priority, it can be suggested to use the following modern concepts in enterprise management. For example, the use of IoT technologies makes it possible to transform an organization's business processes and significantly increase operational efficiency by reducing the duration of production and the duration of the production cycle; reduce operating costs and increase energy efficiency; reduce the number and duration of equipment downtime, and increase its utilization rate.; provides improved product quality.

The use of multi-coordinate machining centers based on digital control also makes it possible to move working tools during machining when performing turning, grinding, and grinding operations. Such four- to six-axis equipment ensures the simultaneous execution of several processes when processing any complex parts, which, in turn, leads to a shorter production cycle. Digital production ensures a high level of labor productivity and high product quality, remote collaboration between project participants, and contributes to a significant improvement in cost control.

The use of hardware and software complexes for production and control leads to the prevention of errors that occur under the influence of the human factor. The development of the industrial Internet of Things. as a result of the use of artificial intelligence based on neural network technologies, it becomes possible to create a "smart production" capable of promptly making decisions about the rational organization of production in the face of problematic situations. The modern paradigm (visibility) of production organization reflects the possibility of adapting equipment to the production of a variety of products, reducing the number of workers employed in production and maintenance, and moving to the production of

new types of products based on the introduction of flexible technologies and robotic systems.

Digital control-based equipment makes it possible to control production processes with high accuracy and make independent decisions based on the data obtained. There are several levels of modern digital production systems. At the physical level, sensors, sensors, and equipment networks are located in the workshops.

Programmable logic controllers (PLC - programmale Logis Controller) are installed at the control and management level of the equipment, with the help of which information is collected.

The highest level of management consists of enterprise resource planning systems (ursp-Enterprise resoures Planning), which are hosted on data center servers.

The organization of digital production makes it possible to reduce the time interval between the order for the design of a product in accordance with the needs of consumers and the manufacture of finished products based on a digital model. The use of digital manufacturing technologies allows industrial robots to create complex-looking products using 3D printers.

The breakthrough of the digital production concept is that already at the stage of product modeling in a virtual environment, production costs are reduced by identifying and eliminating errors. The use of blockchain technologies improves the activities of an enterprise or organization in the field of financial transactions and transactions with tangible and intangible assets, as well as changes the management system by tracking and recording completed transactions (external and internal).

Summarizing the above, the following algorithm (algorithm) is proposedimproving the implementation of digital technologies in industrial enterprises:

When forming a roadmap, it is necessary to take into account the level of material and technical potential and the need for its modernization, as well as the level of personnel potential of the enterprise and the need to improve the skills and motivation of the organization's personnel.

Conclusion

In conclusion, it can be noted that the decision to use modern technologies in the organization of production affects the activities of the entire enterprise, and it is necessary to take into account the risks that may arise with it. Only a thorough planning and comprehensive study of promising technologies, their pros and cons, can you get the desired effect. It is also necessary to take into account the peculiarities of the management of the enterprise in the conditions of digitization. It is possible to create flexible organizational structures using digital information technologies. During the period of digitization, the organization and management of the activities of an industrial enterprise imposes requirements on the head of the organization for professional knowledge, skills and qualifications in both management, production technologies and it technologies.

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THE SOCIO-GEOGRAPHICAL FACTORS INFLUENCING ENVIRONMENTAL CONDITIONS AND PUBLIC HEALTH IN INDUSTRIALISED CITIES

Abstract. *This study investigates the complex interplay between socio-geographical factors and their influence on environmental conditions and public health outcomes in industrialised urban areas. Drawing on data from five representative cities, the research analyzes key variables such as air pollution levels, population density, and respiratory disease incidence to uncover spatial patterns and correlations. The findings reveal that areas with higher pollution indices and greater population concentrations tend to experience elevated rates of respiratory illness, highlighting the compounded effects of environmental exposure and socio-spatial inequality. Visual analyses and statistical evaluations support the argument that socio-geographical configurations—such as urban density, industrial zoning, and limited access to green infrastructure—intensify the health burdens faced by urban populations, particularly among vulnerable socio-economic groups. The study emphasizes the urgent need for integrated urban planning and policy-making approaches that address both environmental and public health concerns through a spatial justice lens.*

Keywords. *Industrialised cities; socio-geographical factors; air pollution; public health; respiratory diseases; urban planning; environmental justice; population density; green space access; environmental epidemiology*

Introduction. Industrialised urban centers across the globe are increasingly grappling with complex environmental and public health challenges. These challenges stem not only from the intensity of industrial activities but also from a web of interconnected socio-geographical determinants. Key among these are high population densities, inadequate urban planning, spatial inequalities, and limited access to ecological infrastructure such as green spaces. In densely populated industrial cities, the concentration of vehicular traffic, factories, and residential areas often leads to elevated levels of air pollutants, including fine particulate matter (PM2.5), nitrogen dioxide (NO_2), and volatile organic compounds (VOCs). Such environmental stressors disproportionately affect urban populations, contributing to a surge in chronic respiratory conditions, cardiovascular diseases, and overall health deterioration. This article critically examines how these socio-geographical variables interact to shape urban environmental quality and public health outcomes, with a particular focus on the prevalence and distribution of respiratory illnesses in industrialised settings.

Methodology. To comprehensively investigate the interplay between environmental conditions and public health in industrialised urban contexts, this study undertook a multi-variable analysis across five representative cities characterized by high levels of industrial activity. Key indicators—including the Air Pollution Index (API), population density (measured in residents per square kilometer), and the incidence rate of respiratory illnesses (per 100,000 population)—were systematically collected from public health records and environmental monitoring agencies. These metrics were selected for their relevance in capturing both environmental stressors and their epidemiological outcomes. Employing bivariate scatter plot visualizations and preliminary correlation analysis, the study aimed to uncover statistically significant relationships between these variables, thereby providing insight into how socio-geographical structures may influence urban health disparities.

Analysis and Discussion. The analytical findings reveal a pronounced and statistically significant positive correlation between elevated air pollution levels and the incidence of respiratory diseases across the studied industrialised cities. Urban areas registering higher Air Pollution Index values consistently report increased rates of respiratory conditions, suggesting a direct link between environmental degradation and adverse health outcomes. This association is likely driven by sustained exposure to harmful airborne contaminants—such as particulate matter (PM2.5 and PM10), sulfur dioxide (SO_2), and nitrogen oxides (NO_x)—which are prevalent in regions with dense industrial and vehicular emissions.

Table 1
Environmental and Health Indicators by City

City	Air Pollution Index	Population Density (per km²)	Respiratory Disease Rate (per 100k)
City A	85	5000	300
City B	90	7000	450
City C	75	4500	280
City D	60	3000	200
City E	95	8000	500

Furthermore, the data underscores the influence of population density as a compounding factor in public health vulnerability. Densely populated urban zones tend to exhibit higher disease prevalence, a pattern attributable not only to greater pollutant concentration but also to reduced per capita access to clean air, healthcare infrastructure, and green open spaces. These spatial inequities further amplify environmental exposure risks and systematically erode the adaptive capacity of vulnerable urban populations—especially those situated within lower socio-economic strata. Limited access to health-promoting resources such as green infrastructure, adequate ventilation, and high-quality healthcare services renders

these communities disproportionately susceptible to the adverse effects of industrial pollution. The compounded burden of environmental and social disadvantage underscores a broader pattern of environmental injustice. Collectively, the evidence reinforces the premise that socio-geographical configurations—encompassing population distribution, urban morphology, and infrastructural disparities—serve as critical amplifiers of the public health consequences associated with environmental stressors in heavily industrialised cityscapes.

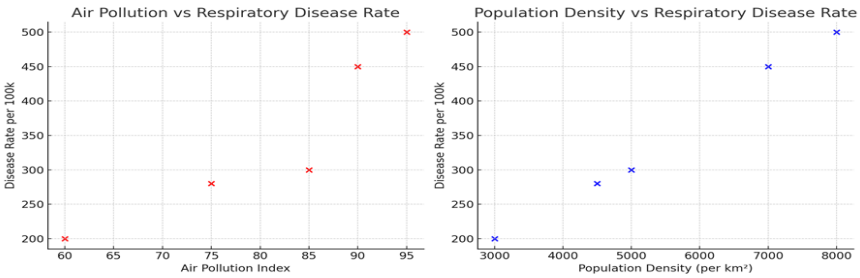

Figure 1. Environmental Factors and Health Outcomes

Conclusion. The findings of this study underscore the profound influence of socio-geographical determinants on environmental quality and public health outcomes in industrialised urban contexts. Factors such as population density, spatial distribution of industrial zones, accessibility to green and recreational spaces, and socio-economic disparities collectively shape the intensity and distribution of environmental risks. These dynamics not only affect air quality but also drive the spatial epidemiology of respiratory and other environmentally linked diseases.

To address these challenges, it is imperative that urban planning practices adopt an integrative and data-driven approach. Strategic interventions—such as equitable green space allocation, implementation of industrial buffer zones, and the decentralisation of essential services—can significantly reduce the environmental burden on vulnerable communities. Furthermore, public health policy must incorporate spatial and demographic data to identify at-risk populations and design targeted prevention and mitigation strategies. Ultimately, embedding socio-geographical analysis within urban development and health governance frameworks is essential for fostering sustainable, resilient, and health-promoting urban environments.

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CHIZIQLI ELEKTR ZINJIRLARNI HISOBLASH USULLARI VA TAHLILI

Annotatsiya: *Elektr zanjirlarini hisoblashdan asosiy maqsad tokni zanjir tarmoqlarida qanday taqsimlanganligini aniqlashdir. Bu vazifa Om va Kirxgof qonunlaridan foydalanib hal etiladi. Elektr zanjirlari hisobi aniq olinsa va himoya qurilmalari to‘g‘ri o‘rnatilsa ko‘yillar xizmat qiladi.*

Kalit so’zlar: *Elektr zanjirlari, Tugun kuchlanish usuli, Qo`shilish usuli, Kontur toklar usuli.*

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METHODS AND ANALYSIS OF CALCULATION OF LINEAR ELECTRIC CIRCUITS

Abstract: *The main purpose of calculating electrical circuits is to determine how the current is distributed in the circuit branches. This task is solved using Ohm's and Kirchhoff's laws. If the calculation of electrical circuits is accurate and the protective devices are installed correctly, the clothes will serve.*

Keywords: *Electric circuits, Nodal voltage method, Connection method, Loop current method.*

Elektr zanjirlarini hisoblashdan asosiy maqsad tokni zanjir tarmoqlarida qanday taqsimlanganligini aniqlashdir. Bu vazifa Om va Kirxgof qonunlaridan foydalanib hal etiladi.

Murakkab elektr zanjirlarini hisoblash uchun turli usullar mavjud bo`lib ularni qaysi birini qo`llash sxemalarda elementlarni qanday joylashishiga va masala shartiga bog`liq[1].

Quyida ushbu usullarni alohida ko`rib chiqamiz.

1. Tugun kuchlanish usuli yordamida ikki tugun nuqtaga ega bo`lgan murakkab zanjirli hisoblanadi.

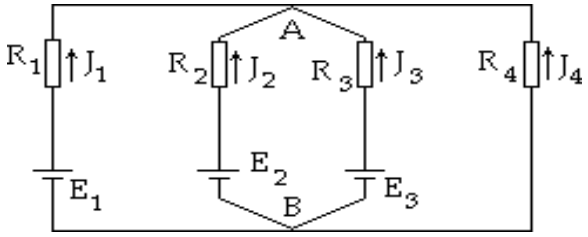
1-rasmda A va V tugun nuqtalarga ega bo`lgan murakkab znjir tasvirlangan. A va V tugun nuqtalari orasidagi kuchlanish **tugun kuchlanish** deb ataladi. V tugundan A tugunga qarab yo`nalgan tok yo`nalishini EYUK larning musbat yo`nalishi deb ataymiz. A va V tugun orasidagi kuchlanish:

$$u = E_1 - J_1 R_1 = E_2 - J_2 R_2 = E_3 - J_3 R_3 = O - J_u R_u$$

Tarmoqlardagi toklarni hisoblash qo`yidagicha bajaralidi.

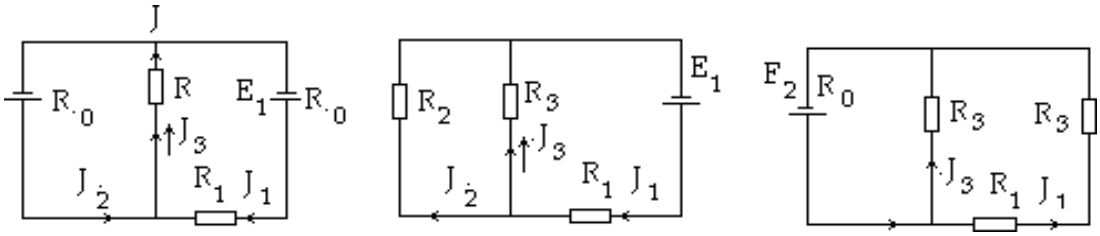
E_1-u	E_2-u	E_3-u	O-u
J_1=-------	J_2=-------	J_3= ------	J_4= --------

R_1 R_2 R_3 R_4



1-rasm. Murakkab elektr zanjirlari.

**2. Qo`shilish usulini** mohiyati shundan iboratki, agar zanjirda bir necha EYUK bo`lsa, zanjirning har bir qismidagi toklarni bir-biridan mustaqil holda, shu qismlardagi EYUK Lar hosil qiladi deb hisoblashmumkin(2-rasm).

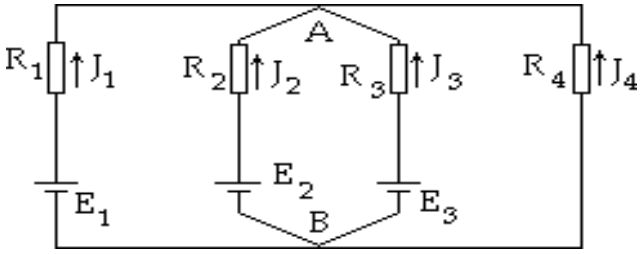


3.

Natijaviy yuklarni topish uchun hususiy toklarni yo`nalishini hisobga olgan holda ularni qo`shamiz[2,3,4].

4. Kontur toklar usuli. Bu usulni qo`llashda murakkab zanjirda kontur toklari qabul qilinib yo`nalishlari qabul qilinadi. Avvalo bu konturlar uchun Kirxgof qonuniga asoslanib tenglamalar tuziladi. Bu tenglamalar sistemasini yechish natijasida kontur toklar qiymatlari aniqlanadi. So`ngra bu toklar asosida zanjir elementlaridagi xususiy toklaraniqlanadi.

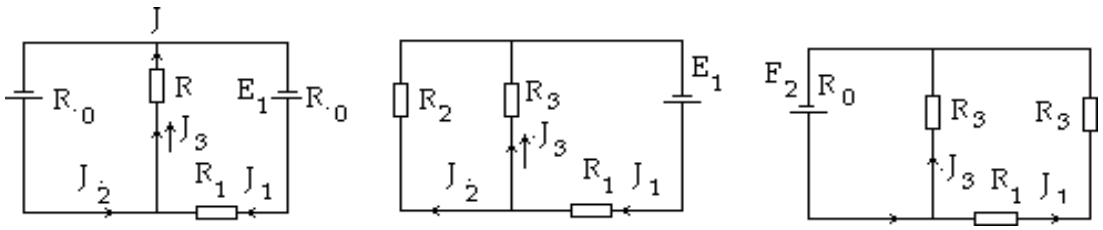
R_1 R_2 R_3 R_4



1-rasm. Murakkab elektr zanjirlari.

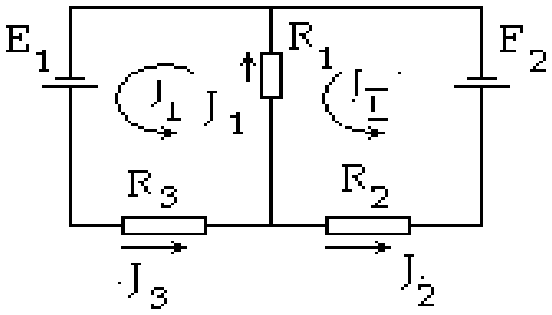
**5. Qo`shilish usulini** mohiyati shundan iboratki, agar zanjirda bir necha EYUK bo`lsa, zanjirning har bir qismidagi toklarni bir-biridan mustaqil holda, shu qismlardagi EYUK lar hosil qiladi deb hisoblash mumkin(2-rasm) [5,6].

Natijaviy yuklarni topish uchun hususiy toklarni yo`nalishini hisobga olgan holda ularni qo`shamiz.



6. Kontur toklar usuli. Bu usulni qo`llashda murakkab zanjirda kontur toklari qabul qilinib yo`nalishlari qabul qilinadi. Avvalo bu konturlar uchun Kirxgof qonuniga asoslanib tenglamalar tuziladi. Bu tenglamalar sistemasini yechish natijasida kontur toklar qiymatlari aniqlanadi. So`ngra bu toklar asosida zanjir elementlaridagi xususiy toklaraniqlanadi.

7.



3-rasmda ko`rsatilgan zanjir uchun tenglamalar tuzamiz va ular asosida xususiy toklarni topamiz[6,7].

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ELEKTROMAGNIT MAYDON TAHLILI

Annotatsiya: *Elektromagnit maydon nazariyasini ishlab chiqilishi va uni tajribalar yordamida tasdiqlanishiga oid tahliliy ishlar va standartlar ko'rib chiqiladi va xulosalar olinadi.*

Kalit so’zlar: *Elektromagnit maydon, Elektr maydoni, Magnit maydoni, Elektr zarad.*

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ELECTROMAGNETIC FIELD ANALYSIS

Abstract: *Analytical works and standards related to the development of the theory of the electromagnetic field and its experimental verification are reviewed and conclusions are drawn.*

Keywords: *Electromagnetic field, Electric field, Magnetic field, Electric*

Elektromagnit maydon nazariyasini ishlab chiqilishi va uni tajribalar yordamida tasdiqlanishiga oid tarixiy ma’lumotlar kitobning boshlanishida aytib o‘tilgan edi. Davlat standartiga ko‘ra *elektromagnit maydon deb, barcha nuqtalarining elektr va magnit xossalari mos ravishda ikkita vektor kattalik bilan aniqlanadigan, birining o‘zgarishi ikkinchisini vujudga keltiradigan va zaradlangan zarrachalarga ularning tezligi va zarad kattaligiga bog‘liq bo‘lgan kuch bilan ta’sir ko‘rsatadigan materiyaning maxsus ko‘rinishiga aytiladi.* Agar elektromagnit maydon vaqt bo‘yicha o‘zgarmasa, u holda u *statsionar maydon* deb ataladi. Bunday maydonda elektr va magnit maydonlarini alohida-alohida o‘rganish mumkin bo‘ladi[1,2].

Elektr maydoni – elektromagnit maydon ikki tomonining biri bo‘lib, elektr zaradi atrofida va magnit maydonining o‘zgarishi tufayli hosil bo‘ladi, zaradlangan

zarracha va jismga ta’sir ko‘rsatadi hamda zaradlangan qo‘zg‘almas zarracha va jismga ko‘rsatadigan ta’sir kuchi bilan aniqlanadi[1,2,3].

Magnit maydoni – elektromagnit maydon ikki tomonining biri bo‘lib, zaradlangan zarracha yoki jism harakati va elektr maydonining o‘zgarishi tufayli hosil bo‘ladi, harakatlanayotgan zaradlangan zarracha yoki jismga ta’sir ko‘rsatadi hamda harakatlanayotgan zaradlangan jismga uning harakat yo‘nalishiga perpendikular yo‘nalgan va tezligiga proporsional bo‘lgan ta’sir kuchi bilan aniqlanadi[3,4].

Elektr zarad – materiya yoki jism xossasi bo‘lib, uni o‘zining va tashqi elektromagnit maydon bilan o‘zaro aloqasini tavsiflaydi. Elektr zarad ikki xil: *musbat zarad* (proton, pozitron va boshqa zarrachalar zaradi) va *manfiy zarad* (elektron va boshqa zarrachalar zaradi). Elektr zarad son jihatdan zaradlangan zarrachaga va jismlarning o‘zaro ta’sir kuchi bilan aniqlanadi[5].

Har qanday zaradlangan zarracha atrofida elektromagnit maydon paydo bo‘ladi va bu maydon zarracha bilan yaxlit bir butunlikni tashkil etadi. Elektromagnit maydon zarrachadan tashqarida ham bo‘lishi mumkin. Zarad miqdori o‘zgarganda mos ravishda o‘zgaruvchan elektromagnit maydon hosil bo‘ladi.

Elektromagnit maydon ma’lum miqdordagi energiyani tashiydi va uning energiyasi kimyoviy, issiqlik, mexanik va boshqa turdagi energiyalarga aylanishi mumkin[5,6].

Elektromagnit maydon quyidagi o‘ziga xos xususiyatlarga ega:

1) elektromagnit maydon – obyektiv borliq - materiyaning maxsus ko‘rinishi bo‘lib, u o‘zaro uzviy bog‘liq va biri ikkinchisini namoyon etuvchi elektr va magnit maydonlarining majmuasidir.

2) elektromagnit maydon modda kabi massaga, energiyaga, harakat miqdori va uning momentiga ega bo‘lib, boshqa materiya hisobiga hosil bo‘ladi va materiyaning boshqa turiga aylanishi mumkin hamda tabiatning asosiy qonuniga ko‘ra bordan yo‘q va yo‘qdan bor bo‘lmaydi. Shu bilan birga elektromagnit maydon fazoda uzluksiz to‘lqin, diskret yoki kvant ko‘rinishida tarqaladi. Bu xususiyat esa faqat elektromagnit maydonga xos bo‘lib, materiyaning boshqa turlarida kuzatilmaydi.

3) elektromagnit maydon tomonidan zaradlangan zarrachalarga ko‘rsatadigan kuch ta’siri maydonning maxsus elektromagnit xususiyati hisoblanadi. Bunday xususiyat mexanikada butunlay kuzatilmaydi.

4) elektromagnit maydon ma’lum sharoitlarda moddaga, modda esa o‘z navbatida maydonga aylanishi mumkin. Masalan, elektron va pozitron ikki kvantli elektromagnit nurlanishga aylanadi, foton yo‘q bo‘lganda esa ikki juft elektron va pozitron hosil bo‘ladi.

Shu narsani ta’kidlab o‘tish joizki, fizik (elektr, magnit va boshqa) maydon va bizga matematika kursidan ma’lum bo‘lgan funksiya, skalyar yoki vektorning maydoni turlicha ma’noga ega. Funksiyaning maydoni deganda bu funksiya aniqlanadigan fazoning sohasi tushuniladi. Fizik maydon xossalarini bayon etishda maydonning matematik tushunchasidan foydalaniladi[7].

Elektromagnit maydon nazariyasini o‘rganish har xil elektr va elektromagnit qurilmalarning ishlash asoslarini bilib olish va eng asosiysi talab etilgan darajada yangi qurilmalarni hisoblash hamda loyihalash imkoniyatlarini yaratadi.

Elektromagnit maydon nazariyasi bilan bevosita bog‘langan amaliy sohalarga elektrotexnika, energetika, avtomatika, radiotexnika, aloqa tizimlari, hisoblash va o‘lchash texnikalari, qishloq va suv xo‘jaligi, tibbiyot va boshqalar kiradi[8].

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ELEKTR USKUNALARINI ISHLATISHDAGI ASOSIY TALABLAR

Annotatsiya: *Ishlatishni yo‘lga qo‘yish elektr energiyaga bo‘lgan talabni uzluksiz elektr ta’minoti, o‘zgarmas chastota, kuchlanishni kerakli me’yori va yuqori tejamkorlik orqali to‘liq qondirilsagina to‘g‘ri hisoblanishini bilish yo‘llari.*
Kalit so’zlar: *Elektrotexnik uskunalar, energetika inshootlari, elektr uskunalar.*

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BASIC REQUIREMENTS FOR THE OPERATION OF ELECTRICAL EQUIPMENT

Abstract: *Ways to know that the implementation of the operation is correct only if the demand for electrical energy is fully met through uninterrupted power supply, constant frequency, the required voltage standard, and high efficiency.*
Keywords: *Electrical equipment, power plants, electrical equipment.*

Ishlatishni yo‘lga qo‘yish elektr energiyaga bo‘lgan talabni uzluksiz elektr ta’minoti, o‘zgarmas chastota, kuchlanishni kerakli me’yori va yuqori tejamkorlik orqali to‘liq qondirilsagina to‘g‘ri hisoblanadi.

Elektr ta’minotining tejamkorligi birinchi navbatda ishlab chiqarish tannerxi, elektr energiyani uzatish va taqsimlash, uskunalarning to‘liq ishlashiga, uning FIK, xodimlarning soniga yoki mehnat unumdorligi orqali baholanadi[1].

Ishlatishni yo‘lga qo’yish va amalga oshirish talablari quyidagi tartibda:

1. Rahbarda mutaxassis xislatlari bo‘lishi, ya’ni rahbar zamonaviy ilg‘or texnikani mukammal bilmog‘i lozim.
2. Tashkiliy tuzilishlarni doimiy ravishda yaxshilash.
3. Mehnat intizomini quvvatlash.
4. Uskunalarni to‘liq bilishi. Bunday bilish o‘zida berilgan tipdagi uskunani ishlatish nazariyasini, stansiyada o‘rnatilgan uskunalarni bilishi, ularning tarkibini, parametrlari va xarakteristikalarini o‘z ichiga jamlaydi.
5. To‘g‘ri ishga kiritish tartibini bilish. U yoki bu sharoitlarda ruxsat etilgan

yuklama miqdori, jarayonga kerakli bo‘lgan ko‘rsatkichlarni ta’minlash, tezlik va uskunani bir holatdan boshqa holatga o‘tish tartibi tejamkor ishlashiga muhim ahamiyat kasb etib va kerakli ishlash muddatini ta’minlashiga ta’sir etadi.

6. Uskunani ko‘rib chiqishdagi na’munaviy tartib. Kirish joylarida tozalikka rioya qilish qoidalarini qo‘yish.

7. Rejaviy ogohlantiruvchi ta’mirlashlarni sifatli o‘tkazish. Rejaviy ogohlantiruvchi ishlarni nazorat qilish muddati ko’zda tutilmaydi. Har qanday ko‘zda tutilgan nosozliklar iloji boricha qisqa muddatda yo‘q qilinishi lozim.

Rejaviy – ogohlantiruvchi ta’mirlash yig‘ilgan nosozliklarni ommaviy yo‘qotilishga kirmaydi, balki ularning vujudga kelishi ogohlantiruvchi hisoblanadi.

8. Oldini olish sinovlarini o‘tkazish va o‘lchov hamda rele uskunalarining aniq tekshirishlarini kiritish. Oldini olish sinovlari uskunani ko‘zdan kechirishda aniqlanmagan nosozliklarni aniqlab beradi, chunki bunday nosozliklar tashqi belgilarga ega emas.

9. Hujjatlarni to‘g‘ri olib borish. Hujjatlar uskunaning o‘tgan umrini, eng ma’qul holatini o‘rnatishga, ko‘zdan kechirish usuli va sozlash usullarini, nosozliklarni yoki halokat sabablarini aniqlashga yordam beradi.

10. Halokat sabablarini sinchkovlik bilan tekshirish. Halokat ishlatishdagi katta yetishmovchilikni birinchi alomatidir. Uni diqqatlik bilan o‘rganish orqali ularni yanada yomon oqibatlarga olib kelishi mumkin bo‘lgan nozik joylarini aniqlash mumkin.

11. Elektrotexnik uskunalarga xodimlarni tayyorlash. Xodimdan egallab turgan lavozimiga monand texnik bilim, ishlatayotgan uskunani bilishi, uni ishlatish qoidalarini va ish joyiga qo’llanadigan ishlab chiqarish ko‘nikmalari talab qilinadi[2,3].

Energetika inshootlari ishchilari majbur:

- uzatilayotgan elektr energiyasining sifatini nazorat qilish. Kuchlanish va chastotaning me’yori, issiqlik tashuvchilarning bosimi va harorati;
- tezkor – dispetcherlik intizomiga amal qilmoq;
- inshootlarni, binolarni, uskunalarni ishlatishga shay holda tutmoq;
- energiya ishlab chiqarishni maksimal tejamkorlik va ishonchliligini ta’minlash.
- inshoot va uskunalarni ishlatish jarayonida sanoat va yong‘in xavfsizligi qoidalariga rioya qilmoq.
- mehnatni muhofaza qilish qoidalarini bajarish.
- ishlab chiqarishdagi insonga va tabiatga bo‘lgan zararli ta’sirlarni kamaytirish.
- elektr energiyani ishlab chiqarishda, uzatishda va taqsimlashdagi yagona o‘lchov birligini ta’minlash.
- tejamkorlik, ishonchlilik, xavfsizlik hamda energetik inshoat tabiatini va atrof - muhit tabiatini yaxshilash maqsadida ilmiy – texnik yutuqlaridan foydalanish[4,5].

Iste’molchilarni uzluksiz elektr energiya bilan ta’minlash muhim ahamiyat kasb etadi, energiya ta’minotidagi uzilishlar sanoat korxonalarining texnologik

jarayonlarini buzishi, elektrlashgan transportning to'xtashiga, shaharlar va qishloqlardagi normal hayotni buzishiga olib keladi. Uzluksiz elektr ta'minoti tezkor xizmatchilarning yaxshi ishlashi, sistemada quvvat zaxirasi va elektr tarmoqlarining ratsional sxemalari orqali ta'minlanadi[6].

Texnologik jarayonlarning buzilishi elektr energiya sifatining kamayishi natijasida ham kuzatiladi. Sistemada chastotaning kamayishi motorlardagi mexanizmlarning aylanish tezligini kamayishiga olib keladi va ishlab chiqarilayotgan mahsulotlarning sifatsizligiga olib kelishi mumkin. Kuchlanishning tushishi motorlarning aylanish momentini kamaytiradi, kuchlanishni oshishi esa yoritgich qurilmalarining umrini qisqartiradi[7].

Elektr energiya sifati nazorati chastota va kuchlanish rostlashni avtomatlashtirish, kompensatsiyalovchi uskunalarni to'g'ri ishlatish, kuchlanishni yuklama ostida rostlash transformatorlarini qo'llash orqali amalga oshiriladi.

Iste'molchi ta'minlashi lozim:

- elektr uskunalarni ishga yaroqli holda saqlash va ularni xavfsizlik qoidalari hamda boshqa me'yoriy – texnik xujjatlarga muvofiq ishlatish.
- elektr uskunalar va elektr qurilmalarning texnik xizmatini, rejaviy – ogohlantiruv ta'mirlashini, sinashni, yangilash va tiklashni o'z vaqtida hamda sifatli o'tkazish.
- elektrotexnik va elektrotexnologik xodimlarni yig'ish, ishchilarni davriy tibbiy ko'riklari, mexnat xavfsizligi, yong'in xavfsizligi bo'yicha yo'riqnomalarni o'tkazish.
- elektrotexnik va elektrotexnologik xodimlarni o'qitish va bilimini tekshirish.
- elektr uskunalarni xavfsiz va ishonchli ishlatish.
- elektrotexnik va elektrotexnologik xodimlarning mehnatini muhofaza etish.
- elektr uskunalarni ishlatishda tabiatni muhofaza qilish.
- elektr uskunalarni ishlatishdagi qoida buzilishlar, elektr uskunalarni ishlatish bilan bog'liq bo'lgan baxtsiz hodisalarni hisobga olish, tahlil qilish hamda ularning paydo bo'lishiga olib kelgan sabablarni yo'q qilish uchun chora tadbirlarni ko'rish.
- elektr uskunalar bilan bog'liq bo'lgan o'limli va og'ir halokatlar hamda guruhli baxtsiz hodisalarni davlat energiya nazoratiga xat orqali ma'lum qilish.
- elektrotexnik xodimlar uchun lavozim yo'riqnomasi, ishlab chiqarishga oid yo'riqnoma hamda tabiatni muhofaza qilish yo'riqnomalarini ishlab chiqish.
- elektr uskunalarning himoya vositalari, o't o'chirish vositalari va jihozlar bilan ta'minlash.
- elektr energiyasining ratsional isrofini hisoblash hamda energiya tejamkorlik bo'yicha tadbirlar o'tkazish.
- elektr uskunalarida, chaqmoqdan himoya qurilmalarini ishlatish, o'lchov asboblari va elektr energiyani hisobga olish vositalarida kerakli bo'lgan tajribalarni o'tkazish[8].

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ELEKTR O‘LCHASHLAR VA ELEKTR O‘LCHASH ASBOBLARINI TADQIQ ETISH

Annotatsiya: *Elektr qurilmalarni uzluksiz nazorat qilib turish, ishlab chiqarish jarayonlarini to‘g‘ri olib borish xamda ulardan samarali foydalanish katta axamiyatga ega xisoblanadi. Buning uchun turli xil fizik kattaliklarni o‘lchash ishlarida elektr o‘lchov asboblaridan foydalanishni talabaga o‘rgatish muxim vazifa xisoblanadi.*

Kalit so’zlar: *O‘lchov asboblari, fizik kattaliklar, elektr o‘lchash, ferrodinamik o‘lchash.*

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RESEARCH OF ELECTRICAL MEASUREMENTS AND ELECTRICAL MEASURING INSTRUMENTS

Abstract: *Continuous monitoring of electrical devices, proper operation of production processes, and their effective use are of great importance. For this, it is an important task to teach students how to use electrical measuring instruments to measure various physical quantities.*

Keywords: *Measuring instruments, physical quantities, electrical measurement, ferrodynamic measurement.*

Elektr qurilmalarni uzluksiz nazorat qilib turish, ishlab chiqarish jarayonlarini to‘g‘ri olib borish xamda ulardan samarali foydalanish katta axamiyatga ega xisoblanadi. Buning uchun turli xil fizik kattaliklarni o‘lchash ishlarida elektr o‘lchov asboblaridan foydalanishni foydalanuvchiga o‘rgatish muxim vazifa xisoblanadi[1].

Elektrik kattaliklarni o‘lchash turli ishlab chikarish jarayonlarini to‘g‘ri olib borishga, elektr qurilmalarini beto‘xtov ishlatishga va ulardan yaxshiroq foydalanishga yoqilg‘i xamda xom ashyoni tejashga imkon berganligi uchun bizning keng masshtabli ishlab chiqarishimizda nixoyatda katta axamiyatga egadir.

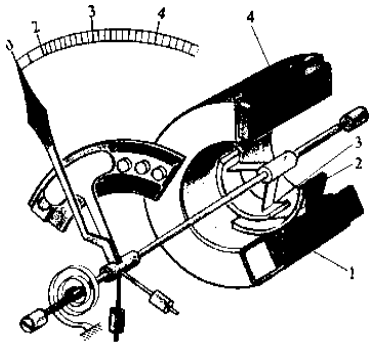
Elektr o‘lchash asboblarini ikkita asosiy guruxga ajratish mumkin: 1.Bevosita baxolash asboblari. 2.Solishtirib o‘lchaydigan asboblar[2].

Davlat standartiga ko‘ra bevosta baxolaydigan asboblar aniqlik darajasiga qarab sakkizta sinfga bo‘linadi 0,05 ; 0,1; 0,2; 0,5; 1; 1,5; 2,5; va 4. Asboblarning shkalasida aniqlik sinfini ko‘rsatuvchi son aylana ichiga olib quyiladi. Nominal kattalik deb, asbobni yuqori o‘lchash chegarasiga aytiladi. Shunday qilib, asbobni keltirilgan xatoligi Umumiy xolda xatolik musbat yoki manfiy bo‘lishi mumkin. Biror kattalikni asbob yordamida o‘lchab aniqlaganda qilingan nisbiy xatolik deb asbobning eng katta xatoligining shu kattalikni o‘lchab topilgan qiymatiga nisbatiga aytiladi, bu nisbat foizlarda ifodalanadi. Shunday qilib asbob bilan kattalikni o‘lchagandagi nisbiy xatoligi aniqlanadi[3,4].

Elektr o‘lchov asboblarini klassifikatsiyalanishi.

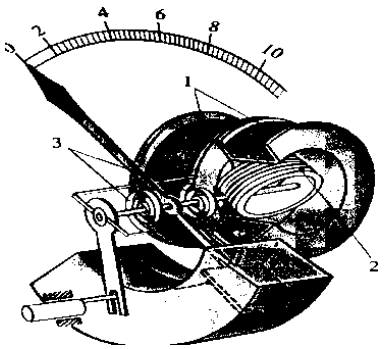
Eng ko‘p tarqalgan tizimlarning o‘lchash mexanizmlari bilan tanishib chiqamiz.

Magnitoelektrik o‘lchash mexanizmi ko‘chmas magnit zanjiri xamda xarakatchan qismdan iborat bo‘ladi.



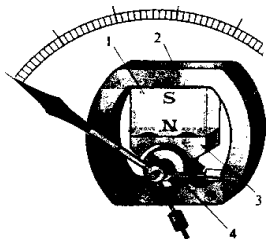
1-RASM. MAGNITOELEKTRIK O‘LCHASH MEXANIZMI. 1-DOYIMIY MAGNIT, 2-MAGNITLI O‘ZAK, 3-MAGNIT QUTBI.

Elektromagnit o‘lchash mexanizmi g‘altak va strelka bilan bir o‘qqa o‘rnatilgan po‘lat o‘zakdan iborat. Xuddi o‘sha o‘qqa teskari ta`sir ko‘rsatuvchi spiralsimon prujina va tinchlantiruvchining alyuminiydan yasalgan sektorsimon yaproqchasi xam o‘rnatiladi. Bu yaproqcha o‘zgarmas magnitning qutblari orasiga joylashtiriladi.



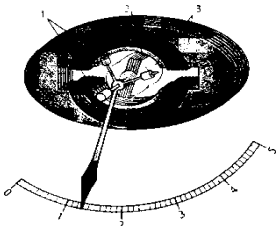
2-RASM. ELEKTROMAGNIT O’LCHASH MEXANIZMI. 1-CHULG‘AM, 2,3- O‘ZAK, 4-EKRAN.

Elektrodinamik tizimdagi o‘lchash mexanzimi ikki sektsiyaga ajratilgan ko‘chmas g‘altak va xarakatchan g‘altakdan iborat bo‘ladi.



3-RASM. ELEKTRODINAMIKDAGI ЎLCHASH MEXANZIMI. 1-2-CHULQAMLAR 3-PRUJINA.

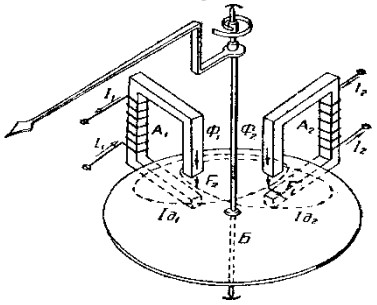
Ferrodinamik o‘lchash mexanizmini ishlash printsipi elektrodinamik o‘lchash mexanizimlarining ishlash printsipidan farq qilmaydi.



4-rasm Ferrodinamik o‘lchash mexanizmlari. 1,2-chulg‘amlar 3-magnitli o‘zak

Induktsion sistemadagi o‘lchash mexanizmidagi ikkita k‘chmas elektromagnit xamda strelka bilan bir o‘qqa o‘rnatilgan xarakatchan alyuminiy diskdan iborat.

5-rasm. Induktsion sistemadagi o‘lchash mexanizmi.



O‘lchash natijalarini taqqoslash va baxolash.

Texnologik jarayonlarni takomilashtirishda, boshqarish tizimlarida, elektr energiyasini uzoq masofalaridan tejamli uzatishda, kerak bo‘lgan joyda uni talabi ga muvofiq taqsimlanishi xamda elektr qurilmalarni osonlik bilan avtomatlashtirish imkoniyatlari elektr o‘lchov asboblari yordamida amalga oshiriladi[5].

Elektr o‘lchov asboblari xalq xo‘jaligida elektr kattaliklari: kuchlanish, tok

kuchi, quvvat, energiya, qarshilik, tok chastotasi shuningdek noelektrik kattaliklar: temperatura, namlik, satx va boshqalarni o‘lchashda keng q‘llaniladi. Elektr qurilmalarining ish rejimi o‘lchash asboblarining ko‘rsatishiga muvofiq kuzatiladi.

Fizik kattaliklarni elektr usul bilan o‘lchash va uning axamiyati.

O‘lchash natijalarini olish usuli bo‘yicha bevosita va bilvosita o‘lchash usul lari mavjud. Bevosita o‘lchashlar shkalasi izlanayotgan kattalik xisobida darajalan gan o‘lchov asboblari yordamida bajariladi. Bilvosita o‘lchashlar yordamchi kattaliklarning qiymatini beradigan asboblar yordamida bajariladi. Bu yordamchi kattalik vositasida izlanayotgan kattalik xisoblab chiqariladi[6].

Maxsus texnik vositalar – o‘lchash asboblari yordamida biror fizik kattalikni qiymatini tajriba yo‘li bilan aniqlash o‘lchash deyiladi. O‘lchash ma`lumotlarini kuzatuvchi vosita o‘zlashtirilishi uchun qulay bo‘lgan shaklda ko‘rsatuvchi texnik vosita o‘lchash asbobi deyiladi. Odatdagi o‘lchashlar uchun mo‘ljallangan asboblar ish asbobi deyiladi. Bu asboblarning shkalalarini darajaga bo‘lib chiqish uchun va ularni tekshirib turish uchun mo‘ljallangan asboblar namuna asboblar deyiladi. Ba`zi elektr o‘lchash asboblarini o‘zgarmas tok zanjirida xam o‘zgaruvchan tok zanji rida xam ishlatish mumkin bo‘ladi. Bunday o‘lchash asboblarini universal o‘lchov asbobi deyiladi. O‘zgaruvchan tokni yuqori kuchlanishli zanjirlariga ulanadigan o‘lchov asboblarining o‘lchash chegaralarini kengaytirish maqsadida kuchlanish va tok transformatorlaridan foydalaniladi. Chunki bunday zanjirlarda o‘lchash chegarala-rini qo‘shimcha qarshilik yordamida yoki shuntlar yordamida kengaytirish mumkin emas. Negaki o‘lchash asbobining chulqamlari yuqori kuchlanish ostida bo‘lib ularni ishdan chiqib qolish xolatlari kuzatilishi mumkin[7].

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O‘ZBEKISTON SEYSMOLOGIK ATLASINI YARATISHNING UMUMIY TAVSIFI

Annotatsiya: *Mazkur maqola O‘zbekiston seysmologik atlasini loyihalash va tuzish masalalariga bag‘ishlangan. Unda atlasning maqsadi, unga qo‘yiladigan talablar, tarkibi va mazmuni, kartalarining ro‘yxati, atlas bo‘limlari va kartalarni joylashtirish ketma-ketligi, shuningdek ularning mazmuni bayon etilgan. Shu bilan birga maqolada atlasni loyihalash, tuzish usullari va undan foydalanishning asosiy yo‘nalishlari tahlil etilgan.*

Kalit so‘zlar: *Seysmologiya, atlas, seysmologik atlas, seysmogen jarayonlar, karta komponovkasi, legenda, kartografik tasvirlash usullari, atlaslarni loyihalash.*

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GENERAL CHARACTERISTICS OF THE CREATION OF THE SEISMOLOGICAL ATLAS OF UZBEKISTAN

Abstract: *This article is devoted to the issues of designing and compiling the seismological atlas of Uzbekistan. It describes the purpose of the atlas, the requirements for it, its structure and content, the list of maps, the sequence of the atlas sections and maps, as well as their content. At the same time, the article analyzes the methods of designing and compiling the atlas, the main areas of its use.*

Key words: *Seismology, atlas, seismological atlas, seismogenic processes, map layout, legend, cartographic representation methods, designing atlases.*

Kirish. Tabiiy ofatlar ichida eng xavflilaridan biri bu – zilzila hisblanadi. Zilzila - yer osti zarbasi va yer ustki qatlamining tebranishi bo‘lib, tabiiy ofatlar, texnologik jarayonlar tufayli yuzaga keladi. Yer ostki zarbasining paydo bo‘lish o‘chog‘i, yerning ostki qatlamidagi uzoq vaqt yig‘ilib qolgan energiyaning ozod bo‘lish jarayoni tufayli yuzaga keladi. Bunday tabiiy ofat aholining tinch hayot kechirishiga tahdid soluvchi eng xatarli hodisadir. Shuning uchun ham zilzila hamda uning sodir bo‘lish jarayonlarini ilmiy jihatdan o‘rganish, uning oqibatlarini tahlil qilish hamda zilzilani prognozlashtirish muhim masalalardan biri hisoblanadi.

Markaziy Osiyoda zilzilalarni muntazam tarzda instrumental kuzatish ishlari ilk bor 1901 yilda Toshkent seysmik stansiyasi ochilgan vaqtdan boshlangan. 1900 yilda seysmik apparatura uchun yer ostida bino qurilishi boshlandi va 1901 yil mayda selner-Repsold gorizontal mayatnigi o‘rnatildi. O‘sha yilning 13 iyulidan boshlab muntazam seysmik kuzatuvlar o‘tkazila boshlandi. Hozirgi kunda ham respublikamizda aholi va hududlarni seysmik xavfdan himoya qilish bo‘yicha aniq maqsadga qaratilgan chora-tadbirlar amalga oshirilmoqda. Seysmologiya va seysmik chidamli qurilish sohasidagi ilmiy-tadqiqot ishlarini jahon talablari darajasiga olib chiqish uchun shart-sharoitlar yaratilmoqda.

Respublikamizda hamda transchegaraviy hududlarda, shuningdek tabiiy va texnogen xavfli hududlarda hamda muhim obyektlarda seysmik xavfsizlik bo‘yicha monitoringni tashkil etish, kuchli va talafotli zilzilalar sodir bo‘lishi xavfi mavjud bo‘lganida ularning oqibatlarini bartaraf etish bo‘yicha ilmiy tadqiqotlarni o‘tkazish, respublika aholisi va hududining seysmik xavfsizligini ta’minlashga qaratilgan keng ko‘lamli vazifalarni hal qilishda seysmologik kartalarning ahamiyati ham yuqori hisoblanadi. Shu sababli yuqoridagi masalalarni hal etishda qaror qabul qilish uchun keng imkoniyatlar yaratuvchi bunday kartalarni birlashtirish hamda O‘zbekiston seysmologik atlasini yaratish bugungi kunda sohaning dolzarb masalalaridan biri edi.

Materiallar va metodlar. O‘zbekiston seysmologik atlasini yaratishda O‘zbekiston Respublikasi hududida seysmik stansiyalarning joylashishni o‘rganish, O‘zbekistonning gidroseysmologik prognostik stansiyalari (suv quduqlari) tarmog‘ini tahlil etish hamda joylashtirish, O‘zbekiston va unga tutash hududlarda tarixiy davrdan shu kungacha sodir bo‘lgan zilzilalari hamda ularning oqibatlarini o‘rganish, O‘zbekiston va unga tutash hududlarda tarixiy hamda instrumental kuzatuv davrlarda sodir bo‘lgan zilzilalar epitsentrlarini geografik joylashuvini aniqlash, hududlarni seysmik mikrorayonlashtirish, seysmik riskni baholash kabi masalalarni hal etish maqsadi ko‘zlangan. Ushbu atlas O‘zbekiston Respublikasi Fanlar Akademiyasi Seysmologiya instituti olimlari tomonidan yillar davomida olib borilgan tadqiqot natijalarini o‘zida aks ettirgan bo‘lib, atlas tarkibiga kiruvchi kartalar ArcGIS dasturi asosida yaratilgan.

ArcGIS geografik axborotni to‘plash, tashkil etish, boshqarish, tahlil qilish, almashinish va taqdim etish imkonini beruvchi to‘liq tizim hisoblanadi. GAT qurilishi va foydalanish uchun platformalar orasida yetakchilardan hisoblangan ArcGIS davlat boshqaruvi, mudofaa, tadbirkorlik, fan, ta’lim, OAV, turizm kabi sohalarda geografik bilimlarni qo‘llashda foydalanib kelinmoqda. ArcGIS dasturida

nafaqat an’anaviy geografik xaritalar, balki turli xil noodatiy ilmiy tasvirlarni, animatsiyalarni ham hosil qilish mumkin.[1] Shuning uchun ushbu dastur yordamida O‘zbekiston sesymologik atlasini yaratish hamda unda yoritiladigan tavsilotlarni turli kartografik tasvirlash usullari bilan boyitish ancha qulay hisoblanadi.

Tahlil va natijalar. Alohida ta’kidlash joizki, seysmologiya sohasini barqaror rivojlantirishda tadqiqotni boshqa usullari qatori kartografik metod ham alohida o‘rin tutadi. Ma’lumotlarni boshqa manbalaridan farqli ravishta, xarita va atlaslarda tasvirlash ancha ko‘rgazmali bo‘lib, seysmologiya hamda ularni yetakchi tarmoqlarini aniq fazoviy-hududiy joylashuvini, hozirgi holatini rivojlantirishning tabiiy va ijtimoiy-iqtisodiy shart-sharoitlarini yaqqol ko‘rsatadi, ularni atrof-muhit bilan bog‘liqligini va aloqadorligini hamda uzoq muddatli rivojlanish istiqbollarini aniqlashga imkon beradi. Shuningdek, sohaviy xarita va atlaslar zamonaviy ilg‘or fan, texnika va texnologiyalar erishgan yutuqlarni targ‘ibot va tashviqot qilish hamda ularni ishlab chiqarishga jorish etishda yaxshi vosita hisoblanadi.

O‘zbekiston Respublikasi Fanlar Akademiyasi Seysmologiya institutida soha olimlarini faoliyati samaradorligini oshirish, ularning ilmiy ishlanmalarini ko‘rgazmali tasvirlash, zizlilalarni prognozlashtirish, aholini xavfdan ogohlantirish hamda shu kabi boshqa masalalarni hal etishga qaratilgan faoliyat doirasida O‘zbekiston seysmologik atlasi ishlab chiqilgan. Atlasning qog‘oz bichimi 36x51 sm bo‘lib, umumiy hajmi 88 bet. Unda 100 ga yaqin karta va karta-sxema berilgan. Kartalarning mazmuni diagramma va jadvallar, tushuntirish matnlari va turli qirqim kartalari bilan to‘ldirilgan. Asosiy kartalar 1:1 500 000, 1:3 500 000 va 1:2 000 000 masshtablarda, shaharlar planlari esa 1:55 000 , 1:65 000 va 1:70 000 masshtablarda tuzilgan. Atlas xaritalarida kartografik to‘r ko‘rsatilgan. Geografik asos elementlari esa xaritalarni ramkasigacha davom etgan.

Atlasning dasturi, maket komponovkasi va kartalarning mualliflik maketlari hamda atlasga tegishli boshqa materiallar atlasni ilmiy tahririy kengashi tomonidan tasdiqlangan. Ilmiy tahririy kengash tarkibi Fanlar Akademiyasi hamda Seysmologiya instituti mas’ul hodimlaridan iborat. Ushbu atlasda tasvirlangan obyektlarni joylashtirish, tasvirlash usullarini tanlash, komponovkasini tuzish, atlasni nashrga tayyorlash B.Mallayev hamda A.Ahmadjonovlar tomonidan ishlab chiqilgan. O‘zbekiston seysmologik atlasi

- O‘zbekiston respublikasi haqida sohaga oid umumiy ma’lumotlar
- Respublika seysmik kuzatishlar tarmog‘i
- Respublika seysmoprognostik kuzatuvlar tarmog‘i
- Kuchli zilzilalarning epitsentral zonalarini makroseysmik tadqiq etish
- O‘zbekiston hududining seysmikligi
- Yirik shaharlar hududlarini seysmik mikrorayonlashtirish
- Seysmik xatar

kabi bo‘limlarni o‘z ichiga olgan.

Quyida O‘zbekiston seysmologik atlasining tarkibiy tuzilishi, bo‘lim va bo‘linmalarining to‘liq ro‘yxati keltirilgan.

1-jadval

O‘zbekiston seysmologik atlasi mazmuni, tarkibi va asosiy kartalarning ro‘yxati

T/r	Bo‘lim va kartalarning nomi	Kartalar masshtabi	Beti
1	Titul		1
2	Taxrir hayati tarkibi		2
3	Mundarija		3
4	O‘zbekiston seysmologik atlasini yaratishda qatnashgan tashkilotlar, muassasalar va shaxslar		5
5	Shartli belgilar		8
6	**O‘zbekiston Respublikasi to‘g‘risida umumiy soha ma’lumoti**		9-10
7	O‘zbekiston Markaziy Osiyoning tabiiy xaritasida	1:4 000 000	11-12
8	Geologik tuzilishi va yer qa’ri resurslari		13-16
9	O‘zbekiston Respublikasi geologik xaritasi	1:2 500 000	17-18
10	Тўртламchi davr tuzilmalari xaritasi	1:2 500 000	19-20
11	Mezozoygacha bo‘lgan davr tuzilmalarining tektonik xaritasi	1:2 500 000	21-22
12	**Respublika seysmik kuzatishlar tarmog‘i**		23-24
13	O‘zbekiston Respublikasi hududida seysmik stansiyalarning joylashish xaritasi	1:3 500 000	25
14	O‘zbekistonda 2020 yil holati uchun zilzilalarning magnituda bo‘yicha qayd etish imkoniyatlari xaritasi	1:2 800 000	26
15	O‘zbekiston Respublikasi hududida gruntlar kuchli tebranishlarining zilzilalar magnitudasi bo‘yicha qayd etish imkoniyatlari xaritasi	1:3 000 000	27
16	**Respublika seysmoprognostik kuzatuvlar tarmog‘i**		28-29
17	Magnitometrik stansiyalar	1:3 500 000	30
18	O‘zbekistonning gidroseysmologik prognostik stansiyalari (suv quduqlari) tarmog‘i	1:3 500 000	31
19	Yer osti suvlarining gidroseysmologik ko‘rsatkichlari (gidrogeodinamik va muhit ko‘rsatkichlari)	1:3 500 000	32
20	Yer osti suvlarining gidrogeoseysmologik ko‘rsatkichlari (suv harorati, gaz-kimyoviy tarkibi)	1:3 500 000	33
21	Seysmik rejimning kompleks prognostik ko‘rsatkichlari bo‘yicha yaqin yillarda seysmik faollashish kutilayotgan hududlar	1:3 500 000	34
22	**Kuchli zilzilalarning epitsentral zonalarini makroseysmik tadqiq etish**		35-36
23	O‘zbekiston va unga tutash hududlarda tarixiy davrdan shu kungacha sodir bo‘lgan zilzilalardan yuzaga kelgan seysmik ta’sirning maksimal jadallik xaritasi	1:3 500 000	37
24	Andijon zilzilasi izoseysti (1902 y.)	1:1 500 000	38
25	Qurshob zilzilasi izoseysti (1924 y.)	1:1 000 000	38
26	Qoratog‘ zilzilasi izoseysti (1907y.)	1:1 500 000	39
27	Chatqol zilzilasi izoseysti (1946 y.)	1:1 500 000	40
28	Isfara-Botken zilzilasi izoseysti (1977 y.)	1:1 000 000	40
29	Toshkent zilzilasi izoseysti (1966 y.)	1:1 500 000	41
30	Nazarbek zilzilasi izoseysti (1980 y.)	1:1 500 000	42
31	Gazli zilzilasi izoseysti (1976 y.)	1:3 500 000	43
32	Gazli zilzilasi izoseysti (1984 y.)	1:3 500 000	44
33	Kon zilzilasi izoseysti (2011 y.)	1:1 000 000	45

34	Tuyabo‘g‘iz zilzilasi izoseysti (2013 y.)	1:1 000 000	45
35	Marjonbuloq zilzilasi izoseysti (2013 y.)	1:1 200 000	46
36	Baxmal zilzilasi izoseysti (2017 y.)	1:1 200 000	46
37	**O‘zbekiston hududining seysmikligi**		47-53
38	O‘zbekiston va unga tutash hududlarda tarixiy hamda instrumental kuzatuv davrlarda sodir bo‘lgan zilzilalar epitsentrlari xaritasi	1:3 500 000	54
39	O‘zbekiston va unga tutash hududlarda tarixiy davrdan shu kungacha sodir bo‘lgan kuchli va sezilarli zilzilalar epitsentrlari xaritasi	1:3 500 000	55
40	O‘zbekiston hududining seysmik faolligi xaritasi (A_{10})	1:2 000 000	56
41	Zilzila o‘choqlari mexanizmlari	1:3 500 000	57
42	Zilzila o‘chog‘i yorig‘ining kinematik turlari (Yu.L.Rebeskiy bo‘yicha)	1:3 500 000	58
43	O‘zbekiston va unga yondosh hududlarning seysmogen zonalari xaritasi	1:3 500 000	59
44	Turli jadallikdagi (6 ball) seysmik ta’sirning takrorlanish davri	1:2 500 000	60
45	Turli jadallikdagi (7 ball) seysmik ta’sirning takrorlanish davri	1:2 500 000	61
46	Turli jadallikdagi (8 ball) seysmik ta’sirning takrorlanish davri	1:2 500 000	62
47	Turli jadallikdagi (9 ball) seysmik ta’sirning takrorlanish davri	1:2 500 000	63
48	O‘zbekiston hududini gruntlar maksimal tezlanishlari qiymatlari bo‘yicha rayonlashtirish 50 yil ichida seysmik ta’sirning oshmaslik ehtimoli P=90%, P=95%, P=98%, P=99%	1:3 500 000	64-67
49	O‘zbekiston hududining makroseysmik shkala ballarida seysmik rayonlashtirish 50 yil ichida seysmik ta’sirning oshmaslik ehtimoli P=90%, P=95%, P=98%, P=99%	1:3 500 000	68-71
50	O‘zbekiston hududining grunt tebranishi tezligi amplitudasi bo‘yicha seysmik xavfi 50 yil ichida seysmik ta’sirning oshmaslik ehtimoli P=90%, P=95%, P=98%, P=99%	1:2 000 000	72-75
51	Toshkent viloyatining mukammal seysmik rayonlashtirish xaritasi	1:750 000	76
52	Toshkent viloyati seysmogen zonalari	1:750 000	77
53	Toshkent viloyati seysmotektonika xaritasi	1:750 000	78
54	G‘arbiy Tyan-Shan faol yer yoriqlari	1:1 600 000	78
55	Farg‘ona vodiysi viloyatlarining mukammal seysmik rayonlashtirish xaritasi	1:900 000	80
56	**Yirik shaharlar hududlarini seysmik mikrorayonlashtirish**		81-82
57	Toshkent shahari hududining seysmik mikrorayonlashtirish xaritasi	1:135 000	83
58	Samarqand shahari hududining seysmik mikrorayonlashtirish xaritasi	1:70 000	83
59	Namangan shahari hududining seysmik mikrorayonlashtirish xaritasi	1:70 000	84
60	Andijon shahari hududining seysmik mikrorayonlashtirish xaritasi	1:55 000	84
61	Farg‘ona shahari hududining seysmik mikrorayonlashtirish xaritasi	1:70 000	85
62	Buxoro shahari hududining seysmik mikrorayonlashtirish xaritasi	1:75 000	85
63	Jizzax shahari hududining seysmik mikrorayonlashtirish xaritasi	1:60 000	86
64	Navoiy shahari hududining seysmik mikrorayonlashtirish xaritasi	1:75 000	86
65	**Seysmik xatar**		87-88

66	Seysmik xavf 6, 7, 8 ballni tashkil etganda Jizzax viloyatining seysmik risk xaritasi	1:700 000	89-91
67	Jizzax shahari hududining mahallalar kesimidagi seysmik zaiflikni rayonlashtirish xaritasi	1:55 000	92
68	Jizzax shahrida qurilishning foydali maydon birligidagi zararning mahallalar kesimidagi xaritasi	1:55 000	93
69	Jizzax shahari hududining seysmik risk bo‘yicha rayonlashtirish xaritasi	1:55 000	93
70	Buxoro shahrini 50, 100, 500, 1000 yilda 1 marta takrorlanadigan tebranishlar davri uchun seysmik risk xaritasi	1:75 000	94-95
71	Kuchli zilzilalar katalogi		96

O‘zbekiston seysmologik atlasini yaratishda respublikamizda, yaqin va uzoq xorij mamlakatlarida atlas kartografiyasi, xususan, tabiiy ofatlarni kartalashtirish sohasida orttirilgan boy tajribalardan, shuningdek, tegishli vazirlik va idoralarning, davlat tashkilotlari va muassasalarning hamda Seysmologiya instituti materiallaridan keng foydalanilgan. Atlas kartalarini mazmunini ishlab chiqishda sohaning malakali mutaxassislari va uning iste’molchilari keng jalb etiladi.

Xulosa. O‘zbekiston seysmologik atlasi soha mutahassislariga respublikamiz hamda transchegaraviy hududlarda seysmiklikni baholash, hududlarni seysmik rayonlashtirish, mintaqaning seysmotektonikasini o‘rganish, zilzila o‘choqlari geografik joylashuvi hamda yer yoriqlarining kinematik turlarini tahlil qilish, respublikamiz hududida gruntlar tebranishlarini va ularning magnitudalarini qayd etish, turli jadallikdagi seysmik ta’sirlarni o‘rganishda muhim ahamiyat kasb etadi. Mazkur atlas ma’lum ma’noda shunga o‘xshash ilmiy tadqiqotlarda hamda zilzilani prognozlashda manba bo‘lib turli darajada xizmat qiladi.

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TA’LIM MUASSASALARIDA MEHNAT MUHOFAZASINI TASHKIL ETISH XUSUSIYATLARI

Annotatsiya; *Ushbu maqolada mehnatni muhofaza qilish tushunchasi, uning huquqiy asoslari va ta’lim muassasalarida amaliy qo‘llanilishi keng yoritilgan. Muallif mehnatni muhofaza qilish sohasidagi asosiy normativ hujjatlar, jumladan O‘zbekiston Respublikasi Mehnat kodeksi, “Ta’lim to‘g‘risida”gi qonun, xalqaro konvensiyalar hamda vazirlik qarorlariga asoslanib, bu sohaning dolzarb jihatlarini tahlil qiladi. Maqolada xavfsiz mehnat sharoitlarini yaratish, himoya vositalari bilan ta’minlash, o‘quv mashg‘ulotlari tashkil etish kabi chora-tadbirlar tizimi bayon etilgan. Mazkur maqola ta’lim muassasalarida xavfsizlik madaniyatini shakllantirish va mehnat muhofazasining samaradorligini oshirishga qaratilgan.*

Kalit so‘zlar: *Mehnatni muhofaza qilish, huquqiy asoslar, mehnat qonunchiligi,ta’lim muassasalarida xavfsizlik, xavfsizlik texnikasi,mehnat sharoitlarini baholash, yo‘riqnomalar,himoya vositalari, pedagog xodimlar xavfsizligi, psixologik xavfsizlik.*

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FEATURES OF OCCUPATIONAL SAFETY ORGANIZATION IN EDUCATIONAL INSTITUTIONS

Abstract: *This article provides a detailed examination of the concept of occupational safety, its legal foundations, and its practical implementation in educational institutions. The authors analyze current issues in the field of labor protection based on key regulatory documents, including the Labor Code of the Republic of Uzbekistan, the Law "On Education", international conventions, and ministerial decrees. The article outlines a system of measures for creating safe working conditions, providing personal protective equipment, and organizing training sessions. This work aims to foster a culture of safety in educational institutions and improve the effectiveness of occupational safety measures.*

Key words: *occupational safety, legal foundations, labor legislation, safety in educational institutions, safety regulations, assessment of working conditions, instructions, protective equipment, safety of teaching staff, psychological safety, state control.*

Mehnatni muhofaza qilish — bu ta’lim muassasalarida talaba va xodimlarning sog‘lig‘ini va xavfsizligini ta'minlash, mehnat jarayonida yuzaga keladigan xavf-xatarlar va kasalliklardan himoya qilish maqsadida ko‘rilgan barcha chora-tadbirlar yig‘indisidir. Bunga quyidagilar kiradi:

-Ish joylaridagi xavfsiz sharoitlarni yaratish;

-Mehnatni muhofaza qilish va xavfsizlik texnikasi bo‘yicha o‘quvlar va ta'limlarni tashkil etish;

-Ishchilarni mehnat sharoitlariga moslashtirish, zaruriy himoya vositalari bilan ta'minlash.

Mehnatni muhofaza qilishning huquqiy asoslari. Mehnatni muhofaza qilishning huquqiy asoslari bir qancha normativ hujjatlarga asoslanadi. O‘zbekistonda bu sohadagi asosiy hujjatlar quyidagilardir:

O‘zbekiston Respublikasi Mehnat kodeksi: Mehnat kodeksi mehnatni muhofaza qilishni ta'minlash bo‘yicha umumiy huquqiy norma va talablarni belgilaydi. Bu kodeksda ishchilarni himoya qilish, mehnat sharoitlari va xavfsizligini ta'minlash bo‘yicha qoidalar o‘z aksini topgan.

O‘zbekiston Respublikasi Prezidentining Farmonlari va Qarorlari:Mehnatni muhofaza qilish bo‘yicha qabul qilingan farmonlar va qarorlar mehnat muhofazasini kuchaytirishga qaratilgan bo‘lib, bu sohada qonun hujjatlarining amalga oshirilishini nazorat qiladi.

Vazirliklarning Mehnatni muhofaza qilish bo‘yicha qarorlari:Davlat organlari tomonidan chiqarilgan maxsus qarorlar va mehnat xavfsizligi bo‘yicha normativ hujjatlar mehnat sharoitlari, ishchilarni himoya qilish bo‘yicha alohida qoidalarga asoslanadi.

Mahalliy farmoyishlar va hujjatlar: Mahalliy darajadagi **farmoyishlar** va hujjatlar, ayniqsa korxonalar va tashkilotlar tomonidan ishlab chiqilgan xavfsizlik qoidalari, ishchi guruhlar va xodimlar uchun qo‘shimcha mehnatni muhofaza qilishni ta'minlaydi.

Mehnat muhofazasining me’yoriy-huquqiy bazasi

Ta’lim muassasalarida mehnat muhofazasini tashkil etish quyidagi me’yoriy hujjatlarga muvofiq amalga oshiriladi:

O‘zbekiston Respublikasining Mehnat kodeksi;

2020 yil 23 sentyabrdagi O‘RQ-637-son O‘zbekiston Respublikasining Ta’lim to‘g‘risidagi Qonuni;

SanPiN va GOSTlar;

O‘zbekiston Respublikasi Mehnat vazirligi va oliy ta’lim, fan va innovatsiyalar vazirligining qarorlari va buyruqlari;

Ta’lim muassasalarining ichki me’yoriy hujjatlari.

Ushbu hujjatlar mehnat muhofazasining umumiy tamoyillari va ta’lim sohasidagi maxsus xavfsizlik talablarini belgilab beradi.

Ta’lim muassasasi rahbari mehnat muhofazasi tizimini tashkil etish va uning faoliyati uchun javobgar hisoblanadi. Xodimlar soniga qarab, ta’lim muassasasida xodimlar soni 50 nafardan ortiq bo‘lsa — mehnat muhofazasi bo‘yicha mutaxassis tayinlanadi. Agar xodimlar soni 50 nafardan kamroq bo‘lsa — tegishli tayyorgarlikka ega boshqa lavozimdagi shaxsga mehnat muhofazasi bo‘yicha mas’uliyat yuklanadi.

Mehnat muhofazasi bo‘yicha mutaxassis asosiy vazifalar:

Mehnat muhofazasi bo‘yicha yo‘l-yo‘riqlar va o‘quv mashg‘ulotlarini o‘tkazish;

Lokal hujjatlarni (yo‘l-yo‘riqlar, nizomlar) ishlab chiqish;

Xavfsizlik talablariga rioya etilishini nazorat qilish;

Nazorat organlari bilan hamkorlik qilish.

Pedagogik va ma’muriy xodimlar quyidagi turdagi yo‘l-yo‘riqlarni o‘tadilar:

-kirish yo‘l-yo‘rig‘i;

-ish joyidagi boshlang‘ich(dastlabki) yo‘l-yo‘riq;

-takroriy yo‘l-yo‘riq (kamida har 6 oyda bir marta o‘tkazilishi lozim);

-rejadan tashqari va maqsadli — ehtiyoj tug‘ilganda.

Talaba va o‘quvchilar ham maxsus kabinetlarda (fizika, kimyo, texnologiya) va jismoniy tarbiya darslarida ishtirok etganda xavfsizlik texnikasi bo‘yicha yo‘l-yo‘riqlardan o‘tadilar. Barcha yo‘l-yo‘riqlar maxsus jurnallarda qayd etiladi.

Ta’lim muassasalaridagi asosiy o‘ziga xoslik — bolalar va o‘smirlarning mavjudligidir. Shuning uchun ma’muriyat quyidagilarni ta’minlashi shart:

Sanitariya-gigiena talablariga rioya qilish;

Bino va uskunalarning texnik holatini nazorat qilish;

Rejali evakuatsiya mashqlarini tashkil etish;

Ta’lim muassasalarida mehnat muhofazasini tashkil etish — bu faqatgina qonun talablarini rasman bajarish emas, balki ta’lim jarayoni ishtirokchilari salomatligi va hayotini muhofaza qilishga qaratilgan kompleks tizimdir. Ta’lim muhitida xavfsizlik madaniyatini shakllantirish — zamonaviy ta’limning ustuvor vazifalaridan biridir.

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TERMOKONSENTRATNI XLORID KISLOTALI PARCHALASH MAHSULOTI VA AMMONIY NITRAT ASOSIDA NP-O'G'ITLAR OLISH

Annotatsiya. *Maqolada Markaziy Qizilqum termokonsentratini xlorid kislotada qayta ishlab olingan bo'tqa kimyoviy tarkibi va uni kislota me'yoriga bog'liqligi, xlorfosforkislotali bo'tqaning filtrlashda hosil bo'lgan mahsulotlar hamda fosfokonsentrat va ammoniy nitrat asosida olingan murakkab NP-o'g'itlar kimyoviy tarkibi keltirilgan.*

Kalit so'zlar. *termokonsentrat, xlorid kislota, xlorfosforkislotali bo'tqa, kislota stexiometrik me'yori, ammoniy nitrat*

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PRODUCTION OF NP-FERTILIZERS BASED ON THERMAL CONCENTRATE DECOMPOSITION PRODUCT WITH CHLORIDE ACID AND AMMONIUM NITRATE

Abstract. *The article presents the chemical composition of the slurry obtained from the Central Kyzylkum thermoconcentrate processed in hydrochloric acid and its dependence on the acid standard, the products formed during the filtration of the*

slurry with chlorophosphoric acid, and the chemical composition of complex NP fertilizers obtained on the basis of phosphoconcentrate and ammonium nitrate.

Keywords: *thermoconcentrate, hydrochloric acid, chlorophosphoric acid slurry, acid stoichiometric ratio, ammonium nitrate*

Kirish. Qishloq xo'jaligini azot, fosfor va kaliyli o'g'itlar bilan hosildorlikni oshirish maqsadida ta'minlash uchun bir qator ilmiy yechimlarni murakkab o'g'itlar olishning samarali usullarini ishlab chiqishga qaratilmoqda. O'simliklarga zarur makro va mikroelementli o'g'itlarni ishlab chiqarishda rangli metallurgiyaning oraliq mahsulotlari va chiqindilarini o'g'itlar ishlab chiqarishga jalb qilish, mahalliy homashyolardan kengroq foydalanish asosida tayyor mahsulotning fizik-kimyoviy xususiyatlariga ularni tashkil etuvchilarini ta'sirini o'rganish zarur.

So'ngi yillarda mamlakatimizda mahalliy xom ashyolardan foydalanib, azot, fosfor, kaliy hamda boshqa ozuqa moddalari tutgan o'g'itlar olish texnologiyalarini yaratishni rivojlantirish bo'yicha bir qator ilmiy izlanishlar olib borilmoqda. Shuningdek, o'g'itlarni qishloq xo'jaligida qo'llashning iqtisodiy samarador usullarini ishlab chiqishni yo'lga qo'yish borasida keng qamrovli chora tadbirlar asosida nazariy va amaliy natijalarga erishilmoqda. Bunda qishloq xo'jaligi o'simliklarini hosildorligini oshirishga xizmat qiluvchi (ammofos, nitrofos, superfosfat, ammiakli selitra va boshq.) o'g'itlarni alohida ta'kidlash kerak.

Markaziy Qizilqum fosforitlari asosida (olingan termokonsentratdan) va maxalliy homashyolardan yuqori samaradorlikka ega bo'lgan yangi turdagi tarkibida xlor tutmagan azot-fosforli murakkab o'g'itlar ishlab chiqarish texnologiyasini yaratish muhim vazifa hisoblanadi.

Tadqiqot ob'yekti va usullari. Termokonsentratni xlorid kislota bilan parchalab, olingan xlorfosforkislotali bo'tqani ikki marta filtrlab olingan fosfokonsentratga ammoniy nitrat ta'sir ettirish yo'li bilan tarkibida ozuqa moddalari turli nisbatlarda bo'lgan murakkab azot-fosforli (NP-) o'g'itlar olish xlorid kislotaning turli xil me'yorlarida o'rganildi. Murakkab NP-o'g'itlar olish jarayonini tadqiq qilish uchun laboratoriya sharoitida termokonsentrat, 31,4%li xlorid kislota va ammoniy nitrat (yoki ITN qurilmasidan chiquvchi 89-92%li ammoniy nitrat eritmasi) dan foydalanildi.

Termokonsentratni xlorid kislota bilan o'zaro ta'siri 20-30 ^{o}C harotda shisha reaktorda 15-20 daqiqa davoda jadal aralashtirish bilan amalga oshirildi. Kislota stexiometrik me'yoriga bog'liq ravishda tarmokonsentratni parchalash uchun xlorid kislota 4-7 daqiqada to'liq berildi. Biroq jarayonning umumiy davomiyligi 1-2 soatni tashkil etadi. Kislota me'yori stexiometriyaga nisbatan 45-75% qilib olindi. Kislota me'yorini hisoblashda termokonsentratdagi fosfat va kalsit (shu jumladan erkin CaO ham) minerallarini monokalsiyfosfat va kalsiy xlorid hosil bo'lishi uchun hisoblandi. Yuvib kuydirilgan fosfokonsentratni kislota bilan o'zaro ta'siri "qattiq fazali rejimda" ko'piklanishlarsiz sodir bo'ldi. Termokonsentrat parchalanishi natijasida kislota me'yoriga bog'liq ravishda harorat 65-85 ^{o}C gacha ko'tariladi. Termokonsentratni xlorid kislotali parchalanishida hosil bo'lgan xlorfosforkislotali

bo’tqani filtrlash jarayonlarida ozuqa moddasi hisoblangan fosforning yo’qotilishini oldini olish uchun pH ko’rsatkichi 5-5,5 ga qadar ammiak gazi bilan neytrallandi. Neytrallangan xlorfosforkislotali bo’tqaning kimyoviy tarkibini kislota me’yoriga bog’liqligi kimyoviy tahlil qilindi (1-jadval).

1-jadval

MQ termokonsentratini xlorid kislotada qayta ishlab olingan bo’tqa kimyoviy tarkibini kislota me’yoriga bog’liqligi, %

Kislota me’yori	N	P_2O_5			CaO			H_2O	Cl^-
		umum.	o’zl.	suv.er.	umum.	o’zl.	suv.er.		
Bo’tqatarkibi									
45	0,28	14,33	6,67	-	31,04	16,96	11,42	35,23	14,48
55	0,40	13,01	7,50	-	28,17	18,72	12,67	38,07	16,07
65	0,55	11,94	8,08	1,07	25,79	19,82	14,17	41,2	17,43
75	0,62	10,75	8,26	1,29	23,29	20,99	15,31	43,83	18,77

Homashyo, olingan oraliq va tayyor mahsulotlar tarkibi quyidagi usullar bilan tahlil qilindi.

Umumiy azot [1; 2] adabiyotlarda berilgan usul bo’yicha aniqlandi. Ushbu usul Devard qotishmasi yordamida nitratli azotning ammiakli azotgacha tiklash va keyinchalik ammiakni haydash va uni titrometrik aniqlashga asoslangan. Ammiakli azot [1; 3] adabiyotlarda berilgan usul bo’yicha aniqlangan. Ushbu usulda ammiakli azotning elementar azotgacha bromli kaliy va pH 6,7 bo’lgan fosfatli bufer eritmasi ishtirokida xloramin bilan oksidlashga asoslangan; xloraminning ortib qolish miqdorini yodometrik usul orqali aniqlanadi.

Nitratli azot [4] adabiyotda berilgan usul bo’yicha aniqlandi. Usul katalizator sifatida ammoniy molibdat ishtirokida nordon muhitda nitratli azotni temir sulfati (II) eritmasi yordamida qayta tiklash so’ngra kaliy permanganat eritmasi bilan temir sulfatning (II) ortib qolgan miqdorini titrlashga asoslangan.

Fosfatlarni aniqlash differensial fotometrik usul orqali olib borildi [1]. Usul sariq rangga ega bo’lgan fosfor vanadiy molibdenli kompleksni hosil bo’lishiga hamda ushbu kompleksning o’z tarkibida ma’lum miqdorda P_2O_5 ni tutgan solishtirma eritmasiga nisbatan λ = 440 nm to’lqin uzunligida optik zichligini fotometrik o’lchashga asoslangan. Umumiy fosfatlarni ajratib olish nitrat kislota bilan, o’zlashuvchan fosfatlarni limon kislota va trilon B eritmasida, suvda eruvchan fosfatlarni esa suv yordamida amalga oshirildi.

Olingan namuna va dastlabki hom ashyolar tarkibidagi kaliy olovli fotometriya usuli bilan aniqlandi [5].

Kalsiy va magniy kompleksonometrik usul orqali aniqlandi [1; 6]. Usul kalsiy va magniy ionlari trilon B eritmasi bilan o’zaro ta’sirlashuvi natijasida indikator rangining o’zgarishiga asoslangan. Sulfatlar tortma (vesovoy) usulida aniqlandi [7]. Usul nordon muhitda bariy xlorid bilan sulfatlarni cho’ktirish va cho’kmani tarozida tortishga asoslangan. Temir va alyuminiy tarkibi kompleksonometrik usulda

aniqlandi [1; 8]. Xlor Mor usuli bilan aniqlandi. Tajriba ishlarida xlorfosforkislotali bo'tqani filtrlash jarayoni KSL-1206-5 markali vakuum nasosda olib borildi.

Ftor miqdorini namunalarni nitrat kislota bilan parchalashdan keyin ionometrik usulda aniqlandi. [1; 9]. Usul ftorni dastlab chiqarib yuborilmasdan ftor-selektiv elektrodidan foydalangan holda eritmadagi ftorni konsentrasiyasini o'lchashga asoslangan.

Karbonatlardagi karbonat angidridning miqdori tezkor hajmiy usulda aniqlandi [10]. Usul karbonatlarni xlorid kislotasi bilan parchalash va bunda ajralib chiqqan uglerod angidridning hajmini aniqlashga asoslangan.

Qattiq namunalardagi suvning miqdorini 100-105°C haroratda quritish shkafida doimiy og'irlikgacha quritish orqali aniqlandi [11].

Tadqiqot natijalari va ularning muhokamasi. Kimyoviy tahlillar ko'rsatdiki, kislota me'yori 45 dan 75% gacha ortib borishi bilan termokonsentratning parchalanish darajasi 46,54 dan 76,83% gacha ortadi. Kislota me'yori 45% bo'lganda bo'tqa tarkibidagi namlik miqdori 35,23%, xlor ionlari miqdori 14,48% ni tashkil etadi. Kislota me'yori 55dan 75% gacha ortib borishi bilan nalik miqdori 1,08 dan 1,25 gacha, xlor ionlari miqdori 1,11 dan 1,30 martagacha ortadi. Kislota me'yorini ortishi hosil bo'ladigan bo'tqaning oquvchanligiga ijobiy ta'sir etadi.

Termokonsentratning xlorid kislotali parchalanish mahsulotlari (bo'tqaning) asosiy tarkibi (mono- va di-) kalsiy fosfatlar, kalsiy xlorid va suv. Kislota me'yori ortib borishi bilan bo'tqa tarkibidagi kalsiy xlor va suvning miqdori keskin ortadi.

Xlorfosforkislotali bo'tqa xlorat tutgan defoliantlar, murakkab NP- va NPK-o'g'itlarini olish uchun asosiy oraliq mahsulot hisoblanadi. Murakkab NP-o'g'itlar olish uchun xlorfosforkislotali bo'tqa laboratoriya sharoitida 2 marta suv:bo'tqa=1:1 nisbatda filtrlandi. 1-filtralash jarayonida hosil bo'lgan filtrat (kalsiy xlorid eritmasi) defoliant olish uchun xomashyo sifatida ishlatildi. Nam qoldiq esa suv bilan 1:1 nisbatda repulpasiya qilinib, 2-marta filtrlandi. 2-filtralash jarayonida hosil bo'lgan filtrat yangi hosil bo'layotgan xlorfosforkislotali bo'tqani filtralash uchun sarflanadi. 2-filtralash jarayonida hosil bo'lgan nam qoldiq (fosfokonsentrat) esa murakkab NP- va NPK-o'g'itlar olish uchun sarflandi. Xlorfosforkislotali bo'tqani 1- va 2-filrlashda hosil blgan nam qoldiqlar va ularni qurtishda hosil bo'lgan oraliq mahsulotlar kimyoviy tahlil qilindi (2-jadval).

Kislota me'yori 45% bo'lganda olingan xlorfosforkislotali bo'tqani 1-filtrlashdan so'ng uning tarkibidagi umumiy fosfor va kalsiyning miqdorlari mos ravishda 23,10 va 34,11% ni tashkil etadi. O'zlashuvchan shakldagi fosfor va kalsiy esa mos ravishda 10,76 va 11,41% ni tashkil etadi.

2-jadval
Xlorfosforkislotali bo'tqaning filtrlashda hosil bo'lgan mahsulotlar kimyoviy tarkibi, %

kislotame'yori	N	P_2O_5			CaO			H_2O	Cl^-
		umum.	o'zl.	suv.er.	umum.	o'zl.	suv.er.		
1-filtrlashdan so'ng									
45	0,45	23,10	10,76	-	34,11	11,41	2,49	27,26	3,15
55	0,73	24,01	13,68	-	31,06	13,63	2,46	27,17	3,12
65	1,18	25,62	17,34	2,31	28,47	15,66	3,53	27,08	3,33
75	1,56	27,07	20,80	3,25	24,11	18,35	4,05	27,00	3,51
2-filtrlashdan so'ng									
45	0,47	24,30	11,31	-	33,39	9,51	0,12	27,01	0,15
55	0,78	25,26	14,56	-	30,22	11,88	0,12	26,86	0,16
65	1,25	27,10	18,35	2,41	27,53	13,97	1,15	26,46	0,24
75	1,66	28,80	22,13	3,45	22,97	16,83	1,61	25,99	0,32
Quritilgan fosfokonsentrat									
45	0,65	33,07	15,40	-	45,43	12,94	0,16	0,68	0,20
55	1,04	34,31	19,78	-	41,04	16,13	0,16	0,67	0,21
65	1,67	36,36	24,61	3,27	36,93	18,75	1,54	1,34	0,32
75	2,2	38,14	29,30	4,57	30,43	22,29	2,13	1,98	0,42

Shuningdek suvda eruvchan shakldagi kalsiy va xlor ionlarining miqdorlari xlorfosforkislotali bo'tqadagiga nisbatan keskin kamayib mos ravishda 2,49 va 3,15% tashkil etadi. Kislota me'yori 55 dan 75% gacha ortib borishi bilan o'zlashuvchan shakldagi fosfor va kalsiy miqdorlari mos ravishda 13,68-20,80 va 13,63-18,35%gacha o'zgaradi. Umumiy kalsiy miqdori 1,10 dan 1,41 martagacha kamayadi. Bundan ko'rinadiki kislota me'yori ortib borishi bilan termokonsentrat tarkibida kalsiy xlorning hosil bo'lishi ortadi va filtralash jarayonida filtrat bilan chiqib ketishi orqali olinayotgan fosfokonsentrat tarkibida fosfor nisbatan boy bo'ladi.

2-filtrlashdan so'ng nam qoldiq (fosfokonsentrat) tarkibidagi xlor ionlari 1-filtrlashga nisbatan mos stexiometrik me'yorlarda 10,97 dan 21,00 martagacha kamayadi. Suvning miqdori kislota me'yoriga qarab 25,99-27,01%ni tashkil etadi.

Filtralash jarayonlaridan so'ng fosfokonsentrat quritildi. Kislota me'yori 75% bo'lganda quritilgan fosfokonsentrat tarkibida umumiy fosfor 38,14%ni uning 76,82% o'zlashuvchan shaklda, umumiy kalsiy 30,43%ni uning 73,25%ni esa o'zlashuvchan shakli tashkil etadi. Quritilgan fosfokonsentrat tarkibidagi namlik miqdori kislota me'yori ortib borish tartibida 0,68 dan 1,98% gacha o'zgaradi.

Olingan nam fosfokonsentrat NP-o'g'itlarini olish uchun asosiy yarimtayyor mahsulot hisoblanadi. Ozuqa moddalari turli nisbatlarda ($N:P_2O_5$=1:0,5 dan 1:2 gacha) bo'lgan NP-o'g'itlarini olish uchun fosfokonsentratga zarur miqdorda

ammoniy nitrat eritmasi (yoki ammiakli selitra) ta’sir ettirildi. Olingan murakkab NP-o’g’itlarini kimyoviy tahlil qilindi (3-jadval).

3-jadval
Fosfokonsentrat va ammoniy nitrat asosida olingan murakkab NP-o’g’itlar kimyoviy tarkibi, %

$N:P_2O_5$	N			P_2O_5			CaO			N_2O
	umum.	amm.	nitr.	umum.	o’zl.	suv.er.	umum.	o’zl.	suv.er.	
kislota stexiometrik me’yori 45% bo’lganda										
1:2	12,6	7,04	5,56	22,25	11,12	-	30,37	8,88	0,11	0,45
1:1	16,88	9,49	8,38	16,76	8,55	-	22,09	6,82	0,08	0,33
1:0,7	20,69	10,81	9,88	13,84	7,19	-	17,90	5,74	0,06	0,27
1:0,5	23,20	11,98	11,23	11,23	5,95	-	14,29	4,74	0,05	0,21
kislota stexiometrikme’yori 55% bo’lganda										
1:2	11,64	6,17	5,46	23,28	13,97	-	27,84	11,12	0,11	0,45
1:1	17,34	8,93	8,4	17,34	10,57	-	20,74	8,43	0,08	0,34
1:0,7	20,33	10,38	9,94	14,23	8,82	-	17,02	7,03	0,07	0,28
1:0,5	22,97	11,66	11,31	11,48	7,23	-	13,74	5,76	0,05	0,22
kislota stexiometrikme’yori 65% bo’lganda										
1:2	12,24	6,681	5,55	24,48	17,13	2,32	24,86	14,60	1,09	0,9
1:1	18	9,412	8,58	18	12,78	1,71	18,28	10,88	0,80	0,66
1:0,7	20,96	10,82	10,14	14,67	10,56	1,39	14,9	7,88	0,65	0,54
1:0,5	23,54	12,04	11,5	11,77	8,59	1,12	11,95	6,41	0,52	0,43
kislota stexiometrikme’yori 75% bo’lganda										
1:2	12,75	7,11	5,63	25,49	20,39	3,18	20,34	17,56	1,47	1,32
1:1	18,54	9,8	8,73	18,54	15,02	2,32	14,79	12,91	1,07	0,96
1:0,7	21,47	11,17	10,3	15,03	12,32	1,88	11,99	9,11	0,87	0,78
1:0,5	24,00	12,34	11,65	12,01	9,96	1,50	9,573	7,36	0,69	0,62

Tajriba natijalari ko’rsatdiki, kislota me’yori 45% va azot hamda fosforning nisbati $N:P_2O_5$=1:0,5 bo’lganda murakkab NP-o’g’itning tarkibda $N_{umum.}$ – 23,20%, $P_2O_{5umum.}$ – 11,23%, $P_2O_{5o'zl.}$ – 5,95%, $CaO_{umum.}$ – 14,29% va $CaO_{o'zl.}$ – 4,74%ni tashkil qiladi. O’g’it tarkibidagi azot va fosforning nisbati $N:P_2O_5$=1:0,7 dan 1:2 gacha o’zganganda $P_2O_{5umum.}$ – 1,23 dan 1,98 martagacha, $CaO_{umum.}$ – 1,25 dan 2,12 martagacha ortadi. Shuningdek o’g’it tarkibida ammoniy nitratning (1:2 dan 1:0,5 gacha) ortishi uning tarkibidagi nitrat shaklidagi azot miqdorini taqriban 2 martagacha oshiradi.

Bu qonuniyatlar xlorid kislotaning boshqa stexiometrik me’yorlarida ham takrorlanadi. Kislota me’yori ortib borishi bilan azot va fosforning bir xil nisbatlarida ularning tarkibidagi ozuqa moddalarining yig’indisi ortib boradi. Masalan, kislota me’yori 45% va azot va fosforning nisbati $N:P_2O_5$=1:1 bo’lganda

ozuqa moddalarining yig'indisi ($\sum N+P_2O_5+CaO_{o'zl.}$) 42,46%ni tashkil etadi. Kislota me'yori 75% bo'lganda ozuqa moddalarining yig'indisi 50,59%ni tashkil etadi.

Ko'rinadiki xlorid kislota me'yori ortib borishi bilan fosfor va kalsiyning o'simlik o'zlashtiradigan shakli ortib boradi. Bir xil me'yorlarda olingan o'g'itlardagi azot va fosforning nisbati $N:P_2O_5$ 1:2 dan 1:0,5 gacha o'zgarishi ya'ni o'g'it tarkibidagi ammoniy nitratning ortib borishi bilan fosfokonsentratni parchalanish darajasi ortishini kuzatish mumkin. Buni o'g'itlar tarkibidagi umumiy fosforga nisbatan o'simlik o'zlashtiradigan shaklini ortib borishi bilan izohlash mumkin.

Xulosa. Demak, termokonsentratning xlorid kislotali parchalanish mahsulotlarining (bo'tqaning) asosiy tarkibi (mono- va di-) kalsiy fosfatlar, kalsiy xlorid va suv bo'lgani sababli, kislota me'yorini oshirish bilan bo'tqa tarkibidagi kalsiy xlor va suvni filtralash jarayonida filtrat bilan chiqarib yuborish hisobiga fosfokonsentrat tarkibidagi fosforni miqdorini oshirish, ozuqa moddalari turli nisbatlarda ($N:P_2O_5$=1:0,5 dan 1:2 gacha) bo'lgan NP-o'g'itlarini olish uchun esa fosfokonsentratga zarur miqdorda ammoniy nitrat eritmasi (yoki ammiakli selitra) ta'sir ettirib, tarkibida nitrat shaklidagi azot miqdorini taqriban 2 martagacha ko'paytirish mumkinligi aniqlandi.

Shuningdek, xlorfosforkislotali bo'tqadan xlorat tutgan defoliantlar, murakkab NP- va NPK-o'g'itlarini olish uchun asosiy oraliq mahsulot sifatida ishlab chiqarishda foydalanish mumkinligi isbotlandi.

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QISHLOQ XO‘JALIGIDA SUYUQ O‘G‘IT-AMMIAKATLARDAN FOYDALANISH

Annotatsiya: *Maqolada respublikamizda ishlab chiqarilayotgan suyuq o‘g‘itlar va ularning afzallaiklari, ammiakatlar navlari, ularning kimyoviy tarkibi hamda tuproqqa berilishi haqida ma’lumotlar keltirilgan.*

Kalit so‘zlar: *ammiakatlar, suyuq o‘g‘itlar, mineral o‘g‘itlar, kalsiy selitrasi, ammiakli selitra, suyuq ammiak bug‘i, PUA markali mashina, suyuq o‘g‘itlarni tuproqqa berish.*

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USE OF LIQUID FERTILIZERS IN AGRICULTURE

Abstract: *The article provides information about liquid fertilizers produced in our republic and their advantages, types of ammonia, their chemical composition and application to the soil.*

Keywords*: ammonia, liquid fertilizers, mineral fertilizers, calcium nitrate, ammonium nitrate, ammonia vapor, PUA machine, application of liquid fertilizers to the soil.*

Kirish

Qishloq xo‘jaligini kimyolashtirmasdan turib uni rivojlantirish mumkin emas. Qishloq xo‘jaligini kimyolashtirish, ekinlar hosildorligi va mahsulot sifatini yaxshilashga imkon beradigan kimyoviy vositalardan keng ko‘lamda foydalanish demakdir. Kimyoviy vositalardan keng va reja asosida foydalanishni o‘z ichiga

olgan tadbirlar kompleksida mineral va organik o‘g‘itlarning me’yoriga, ularni qo‘llash muddatlariga va nisbatiga, bunday tadbirlarning iqtisodiy samaradorligiga e’tibor berish talab etiladi.

O‘zbekistonning issiq iqlimi, uning geografik o‘rni va yer-tuproq sharoiti zararli organizmlarning ko‘payishi uchun juda qulay hisoblanib, ular yer maydonlarida o‘zlari uchun mo‘l oziq va qulay makon topadi, bu esa o‘z navbatida o‘simliklarning ko‘proq zararlanishiga sabab bo‘ladi.

Tadqiqot materiallari va metodologiyasi

Qishloq xo‘jaligi o‘simliklarining hayotiy faoliyatida o‘simlik, tuproq va o‘g‘itlar o‘rtasida kechadigan jarayonlar muhim ahamiyatga ega. Tuproqqa mineral o‘g‘itlarni berish moddalar aylanishi sikliga, ya’ni ozuqa elementlarini kiritishga imkon beradi. Hozirda qishloq xo‘jaligidan asosan qattiq mineral o‘g‘itlardan fosforli, azotli, azot fosforli o‘g‘itlar va suyuq o‘g‘itlar sifatida esa ammiakli suv ishlatilmoqda [1-3].

suyuq o‘g‘itlarning qattiq o‘g‘itlardan afzalligi shundaki, ular tuproq mikrog‘ovaklarida yaxshi diffuziyalanadi va o‘simlikka o‘zlashish darajasi 1,5-2,0 barobar oshadi. Ushbu maqolada avvalo suyuq o‘g‘it olish texnologiyasi, bu o‘g‘itlarni qishloq xo‘jaligida ahamiyati to‘g‘risida fikr yuritilgan. O‘zbekistonning iqtisodiyotida hozirgacha eng katta o‘rinni paxtachilik egallagan va bundan keyin ham bu hol saqlanib qolish imkoniyati mavjud. Shuning uchun paxtachilikda intensiv texnologiyalarni joriy etish va shu bilan birga atrof-muhitni zararlanishiga yo‘l qo‘ymaslik eng muhim masaladir.

Suyuq o‘g‘itlar korxonaga yaqin joylashgan hududlarda, masalan korxonadan 100-200 km atrofida joylashgan qishloq xo‘jalik maydonlarida ishlatilsa yaxshi iqtisodiy samara beradi. Bunday suyuq o‘g‘ilar a, b va c navlarda ishlab chiqarilib aqsh, chexiya, slovakiya, norvegiya, portugaliya, gollandiya va rossiya kabi mamlakatlarda amalda qo‘llaniladi [4-6].

Oldingi davrlarda markaziy osiyo va boshqa mamlakatlarda suyuq o‘g‘itlar ishlab chiqarilmagan va shu bois ular ishlatilmagan. Ayrim hollarda ammiakli suv ishlatilgan. O‘zbekistonda suyuq o‘g‘itlar asosan «farg‘onaazot» aj va boshqa xususiy karxonalarda ishlab chiqarilmoqda.

suyuq o‘g‘itlar qattiq o‘g‘itlarga nisbatan 30% ga arzon bo‘lib, o‘zlashish koeffisiyenti 85-90%, ya’ni qattiq ammiakli selitra va mochevina ishlatilganda yuvilish, nitrifikatsiya va denitrifikatsiya hisobiga 50% ozuqa modda (azot) va boshqa ozuqa moddalar yo‘qolishi maьlum.

Qattiq o‘g‘itlar tuproq namligiga mos ravishda solingan joylarda o‘simlikning o‘sishi kun-xafta ichida 10-12 sm gacha yetib boradi. Agar o‘g‘it suyuq holda berilsa, u tuproq mikrog‘ovaklarida qattiq o‘g‘itga nisbatan 500-500000 marta tezroq diffuziyalanadi (tarqaladi).

Suyuq o‘g‘itlarning ishlab chiqarishda uning tannarxi qattiq o‘g‘itga nisbatan 30% kamroq bo‘ladi. Chunki ularni bug‘latilib, donadorlanmaydi.

O‘simliklar tanasi va shohlarini baquvvat rivojlantiradi, hosildorlikni oshiradi, ya’ni azot, fosfor va boshqa ozuqa elementlarni o‘simlikka o‘zlashishini ta’minlaydi. Tarkibida kalsiy nitrat, ammoniy nitrat, mochevina va ammiak bo‘lgan

suyuq o‘g‘itlar ishlatiladi. Bulardan tashqari g‘o‘zadagi vilt va gammoz, bug‘doydagi zang kasalliklariga qarshi mikroelementli (mis, kobalt, rux va boshqalar) suyuq o‘g‘itlar ishlatiladi. Tannarxi quruq ammiakli selitra va mochevinadan 30% kam, foydali ish koeffisiyenti 35-40% ortiqroq va hosildorlikni 5-7% ga oshiradi. Bundan tashqari o‘simlik kasalliklariga qarshi zaharli va qimmatbaho kimyoviy moddalar ishlatilmaydi [7-8].

Suyuq o‘g‘itlarning ayrimlarida ozuqa moddalar qattiq o‘g‘itlarga qaraganda bir muncha konsentratsiyalangan va iqtisodiy jihatdan ko‘proq foydali. Ya’ni, amalda ishlatiladigan ammiakat tarkibida ozuqabop n 40% atrofida, selitra tarkibida azot qiymati 32,3% ni tashkil qiladi.

Kristallangan ammiak selitrasi tayyorlashda ammiakning yarmi nitrat kislotaga aylanib ketadi, qolgan qismi esa uni neytrallashga sarf etiladi.

O‘g‘it tayyor bo‘lishdan avval olingan ammiak selitrasi ko‘plab ishlovlardan o‘tadi. Suyuq o‘g‘ilar ishlab chiqarishda esa bu jarayonlarni umuman zaruriyati yo‘q. Ammiakatlar ishlab chiqarish sxemasi soddalashadi, nitrat kislotadan iborat bo‘lgan ammakning 25 % gina sarf bo‘ladi [9-10]. Hisob-kitoblarga qaraganda suyuq azotli o‘g‘itlar ishlab chiqarishga asoslangan zavodlar qurish 25% mablag‘ni tejaydi.

Tadqiqot natijalari

Suyuq azotli o‘g‘itlar assortimenti amaliy jihatdan quyidagi turlardan: suyuq ammiak, suvli ammiak, ammoniy nitrat ammiakatlari, kalsiy nitrat, mochevina va boshqalardan iborat bo‘ladi. Ammiakatlar sariq yaltiroq yoki sariq ranglarda bo‘ladi. Texnik shartlarga ko‘ra o‘g‘it sifatidagi ammiakatlar a, b, c navlariga bo‘linadi.

1-jadval

O‘g‘it tarkibidagi a navli, b navli va c navli ammiakatlar tarkibidagi moddalar miqdori.

№	Moddalar nomi	A	B	C
1	NH_3	14-17%	23-26%	18-20%
2	NH_4NO_3	64-67%	53-56%	27-30%
3	H_2O	22-16%	24-18%	30-22%
4	$Ca(NO_3)_2$	-	--	25-28%

A navi – ammiakli selitra va ammiakning suvli eritmasi, 34-37% azot tutuvchi eritma, B navi – xuddi shu komponentlarni tutuvchi lekin 37-40% azot tutuvchi eritma va C navi – ammiakli selitra xolida, kalsiy selitrasi va ammiak eritmalari xolida 28,6-31,7% azot tutuvchi eritmalardir.

Ammiakatlarni suyuq ammiak bilan aralashtirilganda bir oz bug‘ bosimining o‘zgarishi namoyon bo‘ladi. Demak, suyuq ammiak bug‘i 20°S da 7,7 atm bosimiga, 40°Sda 14,9 atm bosimiga va 50°Sda esa 19,7 atm bosimiga ega bo‘ladi.

Ammiakatlar bug‘lari uchun 50°S da A-nav uchun 0,5-0,6 atmosfera bosim, B-nav uchun 1,0-1,5 atmosfera bosim, C-nav uchun 0,4-0,6 atmosfera bosimini tashkil etadi.

Endi biz C-navli ammiakatlar olishning ishlab chiqarish usullari to‘g‘risida to‘xtalib o‘tamiz.

Qoratog‘ fosforitlarini nitrat kislotali ishlanganda ajralgan eritma kalsiy nitrat asosida olingan ammiaktlar – C navini agrokimyoviy sinash maqsadida sobiq Chirchiq elektrokimyo kombinatida tajriba namunalari ishlab chiqilgan.

Qoratog‘ fosforit uni reaktorda 55% li nitrat kislota bilan stexiometrik miqdordan 10-20% ortiq miqdorda qayta ishlanganda erimaydigan qodiq chiqadi. Erimaydigan qoldiq ajratilgandan so‘ng nitrat kislotali eritma tindirgich-sovitgichda 10-15°S gacha sovuq suv yoki tuzli suv yordamida yuviladi. Paydo bo‘lgan kalsiy selitrasi kristallari birlamchi eritmadan ajraladi va sovitilgan nitrat kislotada yuviladi. Bunda nitrat kislota miqdori yuviladigan kristallar miqdoriga teng bo‘lishi kerak. Yuvish ketma-ket uch usulda olib boriladi. Yuvilgan kristallar ammiak (gaz xolidagi) bilan neytrallangandan so‘ng ammiakatlar uchun maxsus qurilmada ammiak miqdori 25% ga yetguncha to‘yintiriladi. Olib borilgan ish natijasida C navli 500-600 kg dan ikki xil nav ammiakat olingan.

2-jadval
Olingan ammiakatlarning kimyoviy tarkibi

Birinchi nav			
№	Moddalar nomi	%	N, %
1	NH_3	26,2	21,58
2	NH_4NO_3	27,3	9,55
3	$Ca(NO_3)_2$	28,09	4,77
4	Umumiy azot		35,90
5	P_2O_5		0,15
Ikkinchi nav			
№	Moddalar nomi	%	N, %
1	NH_3	25,7	21,17
2	NH_4NO_3	20,6	9,21
3	$Ca(NO_3)_2$	25,0	4,25
4	Umumiy azot		32,63
5	P_2O_5		0,6

Muhokama

Zavodda olingan ammiakatlar toshkent viloyati xo‘jaliklarida sinab ko‘rilgan. Ammiakatlarni tuproqqa berish gskb konstruksiyasi pua markali mashinalarda paxta uchun 12-15 sm chuqurlikda solish bilan olib borilgan. Ammiakat c navli suyuq o‘g‘it atiga 5 gektar paxta maydoniga solingan. Quyqalardan hosil bo‘lishiga qaramay kalsiy selitrasi ammiakatini tuproqqa berishda hech qandan qiyinchilikka duch kelinmagan.

Xulosa

Kalsiyli selitra ammiakati bilan ishlanganda mashinada selitra kristallanmaydi, trubalari to‘lib qolishi kuzatilmaydi.

Shuningdek, amaliy jixatdan paxta maydonlarida ammiakat b navidan suyuq o‘g‘it sifatida foydalanish mukinligi namayon bo‘ladi.

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CROSS-BORDER TAX PLANNING AND REGULATORY COMPLIANCE: CHALLENGES FOR MULTINATIONAL CORPORATIONS IN THE POST-BEPS ERA

Abstract: *This article analyzes the key challenges multinational enterprises (MNEs) face in the context of international tax planning and compliance in the post-BEPS era. It examines the erosion of traditional tax strategies, the shift toward substance requirements, and the complexity of reporting obligations under global tax transparency standards. Drawing on OECD/G20 initiatives and regional reforms such as the U.S. TCJA and the EU DAC6, the article outlines practical strategies that legal and tax professionals can use to navigate the evolving tax landscape. Comparative insights and case examples illustrate the global shift from aggressive tax minimization to responsible and transparent tax governance.*

Key words: *BEPS, international tax law, cross-border tax planning, multinational enterprises, compliance, OECD, global minimum tax, transfer pricing, DAC6, GILTI*

Introduction

In recent decades, the global economy has witnessed an unprecedented rise in cross-border business activities. Multinational enterprises (MNEs) have increasingly structured their operations across jurisdictions, often leveraging differences in national tax systems to reduce their effective tax burden. However, concerns about aggressive tax planning and base erosion led to the launch of the OECD/G20 Base Erosion and Profit Shifting (BEPS) Project in 2013. The BEPS initiative aimed to close the loopholes that allowed profits to “disappear” or be artificially shifted to low- or no-tax jurisdictions.

The adoption of the BEPS Action Plan marked a turning point in international tax law, setting the stage for significant regulatory reform. As a result, MNEs are now required to operate within a rapidly evolving framework that prioritizes transparency, substance, and fair tax allocation.

This article explores the main challenges multinational corporations face in the post-BEPS era, focusing on the erosion of traditional tax planning strategies, the increasing complexity of compliance obligations, and the new standards imposed by global tax governance. Furthermore, it outlines practical strategies for legal and tax professionals to support their corporate clients in adapting to this transformed environment.

Overview of BEPS and the Global Tax Reform Landscape

The Base Erosion and Profit Shifting (BEPS) Project was initiated by the Organisation for Economic Co-operation and Development (OECD) and endorsed by the G20 in response to growing public and political concerns that multinational corporations were not paying their fair share of taxes. The final BEPS package, released in 2015, consists of **15 Action Points** designed to equip governments with domestic and international tools to combat tax avoidance, enhance transparency, and ensure that profits are taxed where economic activities take place and value is created.

Among the most impactful BEPS Actions are:

- **Action 1**: Addressing the tax challenges of the digital economy
- **Action 5**: Countering harmful tax practices
- **Action 6**: Preventing treaty abuse
- **Action 13**: Country-by-Country (CbC) reporting for large MNEs
- **Action 15**: Development of a Multilateral Instrument (MLI) to quickly amend bilateral tax treaties [1].

The BEPS framework laid the foundation for a **new era of global tax cooperation**, culminating in the **OECD/G20 Inclusive Framework**, which now includes over 140 jurisdictions. As part of the ongoing reform, the **Two-Pillar Solution** was introduced:

- **Pillar One** reallocates taxing rights to market jurisdictions, particularly targeting digital companies that operate without physical presence.
- **Pillar Two** establishes a **global minimum tax rate of 15%**, aimed at preventing a "race to the bottom" among tax jurisdictions [2].

Together, these reforms are redefining the international tax architecture and placing new burdens on MNEs, which must now navigate a more coordinated but also more complex and enforcement-driven global tax regime.

Key Challenges for Multinational Corporations

The post-BEPS environment presents a radically altered landscape for multinational enterprises (MNEs), requiring them to reevaluate long-standing tax planning strategies. One of the most significant transformations has been the erosion of traditional tax arbitrage tools. Techniques such as hybrid mismatch arrangements, treaty shopping, and aggressive transfer pricing have been heavily curtailed by the OECD/G20 reforms. Instruments like the Principal Purpose Test (PPT), anti-hybrid rules, and strengthened transfer pricing guidelines have removed many of the legal pathways previously used to reduce tax burdens across jurisdictions.

In parallel, the global shift toward a substance-over-form doctrine demands that corporate structures demonstrate real economic presence rather than merely formal legal compliance. Tax authorities now look beyond shell entities and holding companies to assess whether there is genuine commercial activity, local employment, and operational infrastructure behind a company's claimed tax residency or deduction. Jurisdictions known for lenient corporate regimes have been

compelled to introduce substance requirements, while international blacklists pressure tax havens to align with new global norms.

Compliance burdens have also escalated dramatically. The proliferation of disclosure and transparency regimes, such as Country-by-Country Reporting (CbCR), the EU's DAC6 mandatory disclosure rules, FATCA in the United States, and the OECD's Common Reporting Standard (CRS), has transformed tax compliance into a data-driven, resource-intensive undertaking. MNEs are required to maintain detailed documentation, reconcile conflicting jurisdictional requirements, and prepare for audits across multiple tax regimes simultaneously. Failure to comply can result in significant financial penalties and reputational damage.

Moreover, the introduction of principles-based standards—such as the requirement to align profits with value creation—has increased legal uncertainty. Unlike rules-based systems that offer clearer boundaries, these principles can be interpreted differently by tax authorities in different countries. As a result, MNEs face overlapping or even contradictory expectations, complicating their efforts to plan and implement efficient global tax strategies.

Compliance Strategies in the Post-BEPS Era

In response to the challenges imposed by the post-BEPS tax environment, multinational corporations are adopting a range of compliance strategies designed to align their operations with evolving global standards while maintaining tax efficiency and minimizing risk. These strategies require a multidimensional approach that integrates legal structuring, operational realignment, and advanced technology.

A primary focus for many MNEs is the **restructuring of corporate entities** to ensure they reflect genuine economic substance. This includes relocating key decision-making functions, establishing meaningful local operations, and employing staff with real responsibilities in jurisdictions where profits are reported. Substance is no longer a formality—it is a critical defense against regulatory scrutiny. By investing in local infrastructure and talent, companies can demonstrate a legitimate commercial presence and mitigate risks related to tax audits or profit reallocation.

Another important strategy is the **implementation of robust internal governance mechanisms** to manage and document compliance efforts. Tax departments are now expected to maintain real-time transparency over intercompany transactions, transfer pricing policies, and permanent establishment risks. Many corporations have integrated **automated compliance systems**, such as tax data management platforms and risk assessment tools, to ensure accuracy in reporting and reduce manual errors. These systems are especially vital for meeting complex obligations like Country-by-Country Reporting and DAC6 disclosures.

Engaging proactively with tax authorities has also emerged as a best practice. Multinational corporations are increasingly seeking **Advance Pricing Agreements (APAs)** and utilizing **Mutual Agreement Procedures (MAPs)** to clarify tax

treatment across jurisdictions and avoid costly disputes. This type of engagement signals good faith and enhances legal certainty for both businesses and regulators.

Moreover, tax compliance is no longer viewed as a siloed legal function. Forward-thinking MNEs now integrate tax risk assessments into their broader corporate governance and strategic planning. Cross-functional teams—comprising legal, finance, and operational experts—collaborate to assess the implications of international transactions and ensure alignment with the company's ethical and reputational standards.

Ultimately, the post-BEPS compliance landscape rewards companies that adopt a transparent, risk-aware, and technology-enabled approach. Legal professionals must take an active role in advising corporate clients not only on what is permissible under the law but also on how to structure global operations in a manner that is sustainable, defensible, and aligned with the spirit of international tax reform.

Case Examples and Comparative Insights

To better understand how multinational enterprises (MNEs) are adapting to the post-BEPS regulatory framework, it is useful to examine both individual corporate responses and the evolving strategies of jurisdictions around the world. These examples illustrate the diversity of approaches to cross-border tax planning in the new global environment.

One illustrative case involves a European-based technology company that historically utilized an Irish-Dutch tax structure to shift intellectual property income to a low-tax jurisdiction. In response to BEPS Action 5 (on harmful tax practices) and the global movement toward substance requirements, the company undertook a significant restructuring. It repatriated intellectual property to its home country, centralized research and development functions, and registered local entities in its major markets with operational staff. While this led to an increased effective tax rate in the short term, the company reduced its legal risk exposure and improved its reputation with both regulators and the public.

From a jurisdictional perspective, countries have responded to BEPS implementation in diverse ways. The **United States**, while not formally adopting the BEPS package in full, has introduced its own complementary measures through the **Tax Cuts and Jobs Act (TCJA)**, including the **Global Intangible Low-Taxed Income (GILTI)** and **Base Erosion and Anti-Abuse Tax (BEAT)** provisions. These measures target similar objectives: discouraging profit shifting and ensuring minimum taxation on foreign earnings [3].

In contrast, the **European Union** has adopted a more unified and aggressive stance, implementing mandatory disclosure regimes (such as DAC6), enforcing economic substance requirements, and promoting coordinated action on digital taxation. At the same time, **low-tax jurisdictions** such as the Cayman Islands, Bermuda, and the British Virgin Islands have introduced substance-based reporting obligations in response to international pressure and blacklisting threats from the EU [4].

These examples underscore a critical trend: multinationals can no longer rely on a single jurisdiction's lenient laws to minimize tax liability. Instead, compliance must be achieved through globally coordinated efforts and risk-informed decisions that respect the legal and ethical expectations of the international community.

Conclusion

The post-BEPS era has ushered in a new paradigm for international tax planning and regulatory compliance. Multinational corporations are now operating in a global environment that prioritizes transparency, economic substance, and fair taxation over aggressive profit-shifting techniques. The tools and strategies that once enabled corporations to exploit jurisdictional mismatches have largely been neutralized by coordinated international efforts, led by the OECD and G20 through the Inclusive Framework.

In this context, legal and tax professionals must adopt a proactive and strategic approach to advising multinational clients. Success no longer depends solely on technical knowledge of tax treaties or transfer pricing rules, but also on the ability to integrate tax considerations into the broader framework of corporate governance, ethical business practices, and long-term operational sustainability.

Key compliance strategies include restructuring corporate entities to reflect real substance, investing in automation and real-time reporting tools, and engaging constructively with tax authorities through cooperative mechanisms such as APAs and MAPs. Multinationals must also navigate jurisdictional variations—such as the U.S. implementation of GILTI and BEAT, or the EU's robust transparency initiatives—by building globally coordinated tax governance systems.

Ultimately, the reforms introduced through BEPS and its ongoing extensions mark not just a shift in rules, but a transformation in the philosophy of international taxation. Multinational enterprises that embrace this new framework with integrity, technological adaptation, and legal diligence will be best positioned to succeed in a world where tax planning is no longer about minimizing liability at all costs, but about achieving compliance and resilience in a rapidly changing global landscape.

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THE ROLE OF VIRTUAL REALITY IN MODERN GEOGRAPHY EDUCATION: OPPORTUNITIES AND CHALLENGES

Abstract: *Virtual Reality (VR) is increasingly being integrated into geography education, providing immersive learning experiences that enhance spatial thinking, engagement, and conceptual understanding. This study explores the opportunities and challenges of incorporating VR in geography curricula. A mixed-methods approach was used, analyzing existing literature and conducting surveys among educators and students. The findings highlight the potential benefits of VR in improving student motivation and geographical skills while addressing technical, pedagogical, and financial barriers. The study provides recommendations for effective VR integration in geography education.*

This article discusses how Virtual Reality (VR) technologies, along with associated software and content, can serve as effective tools for teaching and learning in geography. Based on the authors' direct experience of incorporating VR into both undergraduate and postgraduate education, the article first examines how VR can support the development of students' fieldwork observation skills and deepen their understanding of specific places before engaging in real-world field experiences. Next, the article explores how VR can help students build critical thinking and analytical skills, particularly in relation to emerging visual technologies and the broader impact of VR on how people, places, and landscapes are represented. Lastly, it highlights how both VR and Augmented Reality (AR), given their increasing use in industry, can help students acquire distinctive practical skills that are valuable for geovisualization tasks—thus enhancing their future employability in geography-related careers.

Key words: *Virtual Reality, Geography Education, Spatial Thinking, Virtual reality (VR); fieldwork; employability; critical analytical skills; visual analysis; augmented reality (AR) Immersive Learning, Digital Pedagogy, Digital Mapping, Geospatial Analysis.*

INTRODUCTION

In today's digitally literate society, education is encountering challenges that highlight the necessity of re-evaluating traditional paper-and-pencil teaching methods. As digital tools continue to advance, future professions are becoming more complex, requiring university graduates to develop digital skills in order to thrive in an ever-evolving information landscape.

The key directions of the digitalization process include:

- Personalization of learning experiences (customized educational approaches).
- A general decline in reading habits.
- Increased accessibility of education.
- Ensuring information security.
- The integration of gamification into education.

The advancement of digital technologies has significantly influenced educational methodologies, with Virtual Reality (VR) emerging as a promising tool in geography education. VR enables students to experience geographical phenomena interactively, reducing the limitations of traditional classroom-based learning. However, despite its benefits, the integration of VR in geography curricula presents multiple challenges, including accessibility, cost, and pedagogical adaptation. This study aims to explore both the advantages and limitations of VR implementation in geography teaching.

The teaching of geography has progressively shifted towards a more practical approach, emphasizing the application of geographical knowledge and skills through digital solutions, ICT tools, and innovative methodologies (González, 2014). The impact of technological advancements, including digital content and teaching methods, is now deeply embedded in geography education, influencing curriculum design, study materials, classroom activities, and learning objectives in line with the International Charter on Geographical Education (IGU-CGE, 2016). As educational technology continues to evolve, new pedagogical approaches have emerged, aiming to integrate technology-driven methods into geography lessons, leveraging the subject's interdisciplinary nature and the ongoing digital transformation of society (Hazen, 2020).

Despite these advancements, the significance of geographic knowledge and the status of geography as a subject in Hungarian public education have gradually diminished over the past two decades. Changes in national curricula—revised twice within 15 years—along with a limited number of weekly lessons (1-2-2-1 from Grades 7 to 10) and a decline in students opting for intermediate-level school-leaving exams have contributed to geography being perceived as a less relevant subject (Chrappán, 2020), (Probáld, 2017). Research indicates that while students generally express an interest in geography and enjoy the subject, they do not view it as particularly important or useful, making it challenging to convey the relevance of geographical knowledge and maintain student motivation (Chrappán, 2020). The only notable improvement has been an increase in advanced-level final exam participation, primarily due to its relevance in university admissions for agricultural and economic studies.

Literature review

Numerous studies have examined the role of VR in education, particularly in geography. Table 1 presents key studies on VR applications in geography teaching. Virtual Reality (VR) is a platform that provides a variety of digital tools and services, supporting diverse teaching and learning activities. The adoption of VR in higher education began nearly a decade ago, focusing primarily on teacher training

to equip future educators with the skills needed to navigate technology-rich learning environments, where information consumption is facilitated by information and communication technology (ICT).

Table 1. Key studies on VR applications in geography teaching.

Study	*Focus Area*	*Key Findings*
Smith et al. (2020)	Spatial Thinking	VR enhances students' ability to visualize geographic data.
Johnson & Lee (2019)	Fieldwork Simulation	VR reduces logistical challenges of real-world fieldwork.
Brown et al. (2021)	Student Engagement	VR increases motivation and knowledge retention.
Wilson (2022)	Pedagogical Integration	Effective use of VR requires teacher training and curriculum redesign.

The use of VR in education dates back to the early 21st century T. (Monahan 2008) and has been integrated into multiple teaching strategies and scientific disciplines. One of its most prevalent applications is in e-learning (B.Lampert 2018), though it can also complement traditional instructional methods. For example, VR plays a crucial role in medical education, enhancing the effectiveness of learning materials (J.Falah 2014), (S.Jang 2017) and addressing rehabilitation challenges (A. Gilányi 2017), (M.Yates 2016). In engineering, VR is increasingly utilized both as an educational tool (I.Horváth 2016) and a professional workspace. Additionally, VR is being applied in business training to enhance various professional competencies (L. Kiss 2015), (A.Tarabasz 2018). Research findings indicate that VR has a profound impact on educational processes, improving cognitive skills such as creative thinking and problem-solving (Gy. Bujdosó 2017), (R. Hu 2016). Moreover, studies reveal that VR environments positively influence soft skills like collaboration and teamwork (Gy. Bujdosó 2017), (V. Kövecses-Gősi 2018), providing learners with opportunities to develop a broad spectrum of abilities.

Methodology

This research conducted an in-depth evaluation of the integration of digital platforms in geography education. Initially, an extensive literature review was carried out to examine the effects of GIS, VR, AR, and interactive maps on the learning process. A quantitative approach was employed, collecting data from 50 secondary school classes. Students were divided into two groups: one received instruction through traditional teaching methods, while the other utilized GIS and

VR/AR technologies. Over several weeks, spatial reasoning abilities, engagement levels, and overall knowledge retention were assessed, and the academic performance of both groups was compared. Statistical analysis was conducted using SPSS software, with results deemed statistically significant at $p < 0.05$.

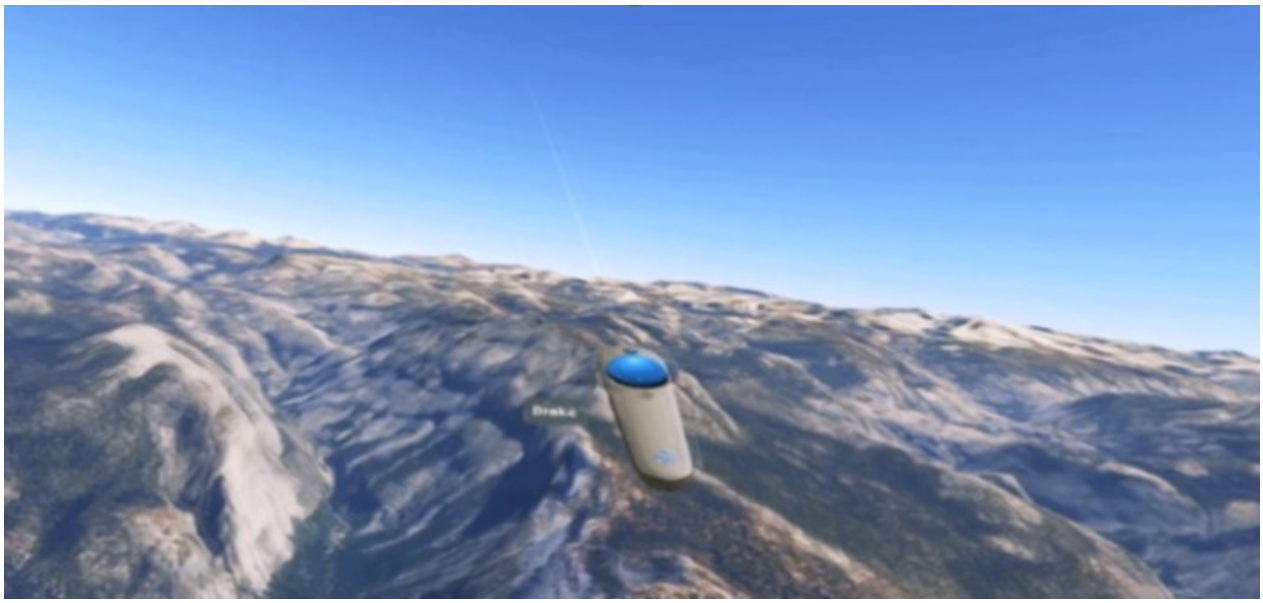
Furthermore, interviews with teachers and students provided insights into the reception of these technologies in the classroom and their overall effectiveness. This methodological approach ensures the reliability and scientific validity of the findings, offering a clearer understanding of the role of digital tools in geography education.

Findings and discussion

Virtual reality (VR) technologies significantly enhance the learning experience by making it more visual, engaging, and interactive. Through computer-generated environments that respond to user input, learners are immersed in lifelike simulations that enrich understanding. In the field of experimental education, VR offers students an intuitive and immersive way to explore real-world scenarios (Zhang et al., 2020).

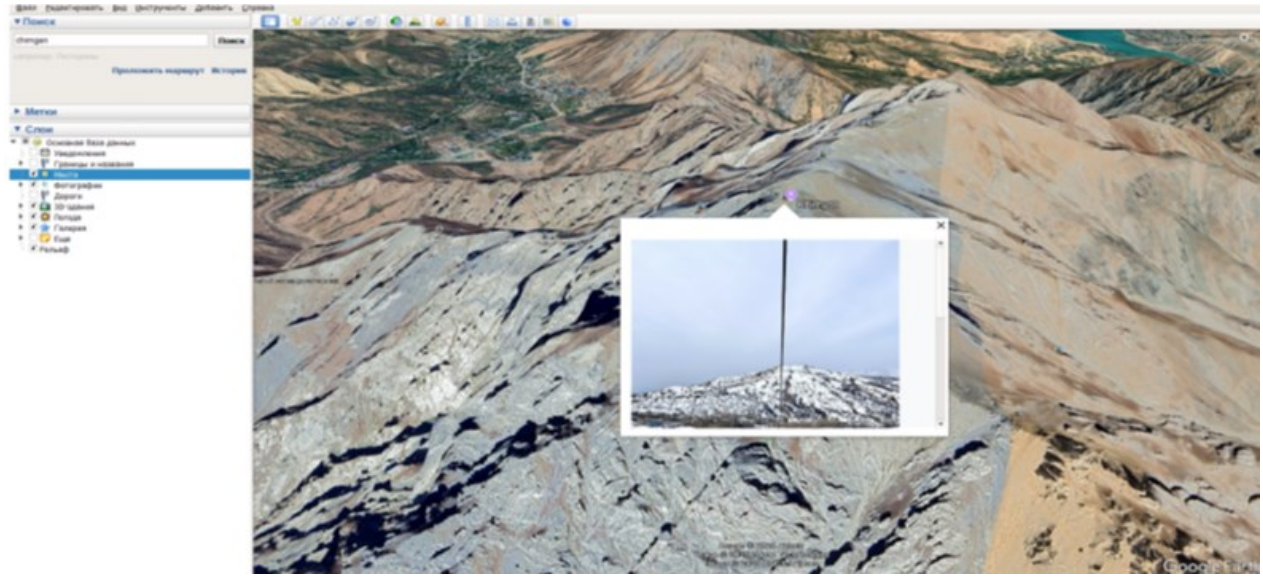
One practical application is a forensic investigation simulation, where learners engage in virtual lab activities to examine and analyze crime scenes using digital tools. These VR-based modules combine theoretical lectures with hands-on virtual labs, allowing students to assume the role of an investigator. A sample scenario begins with a company CEO expressing concerns over internal data breaches and hidden stolen blueprints. The instructor then tasks students with locating the blueprints and collecting relevant evidence for forensic analysis (Hassenfeldt et al., 2020).

Meanwhile, Google's Google Earth VR project illustrates another innovative use of VR by enabling users to explore famous global landmarks such as the Eiffel Tower, Egyptian Pyramids, or Niagara Falls in a fully immersive environment. Users can even simulate space travel and view Earth from a shuttle's perspective. The application allows for navigation through changes in altitude, direction, and even time of day, all controlled via VR headset controllers. Freely accessible, Google Earth VR makes planetary exploration possible without leaving home.



(**Figure 1.** Google Earth VR Application)

Various VR technologies have been utilized as pedagogical tools, often emphasizing hardware such as VR Head-Mounted Displays (HMDs) like Oculus Rift (Moro et al., 2017), Google Cardboard (Stojšić et al., 2017), and Samsung Go. However, these approaches tend to overlook supplementary technologies and software essential for VR content creation, such as 360-degree cameras (GoPro Max 360, Samsung Gear 360), virtual tour software (ThingLink, TourWeaver), and additional hardware like Augmented Reality Sandboxes.



(**Figure 2**. View of the Chimgan Mountains through Google Earth)

It is crucial to explore the diverse range of VR and AR technologies, their potential applications in education, and the practical aspects of their classroom integration. This paper specifically examines how VR and AR can be effectively utilized in teaching, with a focus on enhancing fieldwork experiences, developing

students' critical analytical skills, and preparing them for a job market that increasingly relies on technology (Davis, 2017). To support this, the study draws on firsthand experiences of using VR in teaching, presenting case studies and student feedback from surveys to demonstrate its effectiveness as an educational resource.

VR technology was utilized to prepare for an annual first-year human geography residential field trip held in the Chimgan Mountains, Uzbekistan. The fieldwork centered on the concept of "living landscapes," examining diverse cultural, economic, social, and political issues present in the area. Before the trip, students attended a series of preparatory lectures that introduced both theoretical frameworks and methodological approaches for studying landscapes, enabling them to design independent group projects.

Prior to the field trip, a collection of static 360-degree images and video footage was captured from various field sites using a Samsung Gear 360 camera. The recorded content was then processed with specialized software and uploaded to Oculus Go headsets. The integration of VR technology provided valuable learning opportunities to help students prepare for fieldwork.

Firstly, the VR headsets allowed students (n = 6) to observe and immerse themselves in the landscapes they would later visit in person. Using footage from near the peak of Greater Chimgan, the highest mountain in the region and a popular tourist destination, students worked in pairs to analyze human influence on the landscape and identify emerging socio-spatial issues. According to student feedback, this activity helped them maintain focus on a specific location while enhancing their ability to "look [and] listen for different things." Additionally, the immersive nature of the headsets minimized external distractions, allowing them to "focus more on the environment." However, some students noted that occasional pixelation in the footage reduced the overall VR experience, making it more difficult to distinguish key landscape features.

Secondly, VR technology enabled students to practice observational techniques and explore both qualitative and quantitative approaches to landscape studies within a classroom setting. Specifically, the methodology was influenced by the "Mapping Tranquility" report from the Campaign to Protect Rural England (CPRE), which employs a quantitative framework to assess factors that enhance or diminish perceptions of tranquility. By using VR, students could apply these techniques beforehand, systematically identifying both visual and auditory attributes of tranquility within the virtual landscape. This approach allowed them to refine their methodological skills in advance, reducing the need for extensive training in the field.

Finally, a crucial part of fieldwork preparation within academic institutions involves identifying, assessing, and documenting potential risks and hazards (Higgitt & Bullard, 1999). The VR content allowed students to examine the landscape for possible dangers, such as uneven terrain, roads, vehicles, and potential interactions with both human and non-human elements. The 360-degree view helped students spatially contextualize the landscapes they would explore, while the visual-audio footage provided insights into challenging weather conditions—a

significant factor in the Chimgan Mountains, particularly during winter. This process fostered collaboration as students worked together to complete the risk assessment, equipping them with the necessary skills for their own risk assessment submissions later in their studies.

(**Figure 3**. A 360-degree image captured using a Samsung Gear 360 camera at the summit of Greater Chimgan, Uzbekistan) (Source: Authors).

Table 2. Benefits of VR in Geography Education

Benefit	*Description*
Improved Visualization	VR helps in understanding complex topographical data.
Enhanced Student Engagement	Students show higher motivation and participation.
Simulated Fieldwork	Reduces costs and logistical barriers to real-world geography studies.
GIS Integration	Combining VR with GIS enables advanced spatial analysis.

Table 3. Challenges and Solutions for VR in Geography

Challenge	*Proposed Solution*
High costs	Funding through grants and public-private partnerships.
Technical limitations	Investing in cloud-based VR solutions.
Lack of teacher training	Organizing VR workshops for educators.
Accessibility Issues	Providing affordable VR headsets to schools.

CONCLUSION AND RECOMMENDATIONS

This study has highlighted various ways in which virtual reality (VR) technologies can serve as valuable tools to enrich the teaching and learning of geography. The examples discussed demonstrate that VR and augmented reality (AR) can effectively stimulate student interest and participation in essential fieldwork activities, foster critical visual interpretation skills, and potentially improve future employment opportunities as these technologies gain traction in commercial settings.

Nonetheless, several challenges must be addressed. These include limited access and high costs associated with acquiring such technologies for educational

institutions, as well as the need for adequate staffing and resources to deliver effective instruction. Additionally, the rapid development of the VR and AR industries demands regular hardware updates and continuous improvement of technical competencies and knowledge.

From the learners' perspective, engagement levels with VR/AR tools can differ significantly among individuals. This suggests a need for further investigation into how student characteristics influence their interaction with immersive technologies, and how this variation affects pedagogical approaches. Moreover, VR headsets have been reported to cause motion sickness in some users, which may result in their exclusion from learning experiences.

Despite these challenges, the study underscores the promising role of VR and AR in enhancing student motivation and in supporting the development of essential geographical knowledge and skills. In some cases, familiarity with these technologies may also provide a competitive edge in the job market for graduates.

Based on the findings of this study, several key recommendations can be made to improve the integration and effectiveness of VR/AR technologies in geographical education:

- Educational institutions should seek strategic investments or partnerships to make VR/AR technologies more affordable and accessible. Grants or public-private collaborations can help reduce the cost barriers for departments.
- Regular training programs should be implemented to ensure that educators and technical staff stay updated with evolving VR/AR tools. Building internal expertise is crucial for the sustainable use of immersive technologies in classrooms.
- VR/AR should be purposefully embedded into the geography curriculum to enhance learning outcomes—especially in fieldwork-based modules, environmental modeling, or spatial analysis. Such integration should align with learning objectives and not be used as novelty.
- Special attention must be given to students who experience motion sickness or other discomforts when using VR headsets. Alternative formats or adaptive methods should be developed to ensure inclusive participation.
- Continued research is needed to explore how different student characteristics (e.g., learning styles, digital literacy levels, socio-economic backgrounds) affect engagement with VR/AR. This can help tailor pedagogical approaches for diverse learners.
- Incorporating VR/AR skills into student learning portfolios can enhance their competitiveness in the job market. Institutions should align VR-based activities with real-world applications and industry needs.

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PARKENT TUMANI QISHLOQLARI TOPONIMIYASI VA ULARNING TABIIY-GEOGRAFIK JOYLASHUVI

Annotatsiya: *Ushbu ilmiy maqolada Parkent tumani hududida joylashgan qishloqlarning toponimiyasi va ularning tabiiy-geografik joylashuvi masalalari atroflicha tahlil qilingan. Toponimlar – bu faqat geografik joy nomlari emas, balki xalqning tarixiy xotirasi, madaniy an’analari va tabiat bilan o‘zaro munosabatini ifodalovchi muhim ma’lumot manbaidir. Tadqiqot davomida tuman tarkibidagi o‘nlab qishloq nomlarining kelib chiqishi, lug‘aviy ma’nosi, fonetik shakli, tarixiy ildizlari hamda ularni shakllantirishda ishtirok etgan ijtimoiy, iqtisodiy va tabiiy omillar chuqur o‘rganildi.*

Ushbu tadqiqot natijalari mahalliy geografik ta’limda, hududiy rivojlanish rejalashtirishida va turizm sohasida qo‘llash uchun amaliy ahamiyatga ega bo‘lib, Parkent tumani bo‘yicha toponimik fondni boyitadi.

Kalit so‘zlar: *Geografiya, toponimika, tarix, Parkent, toponimik tadqiqotlar, GAT*

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TOPONYMY OF VILLAGES OF PARKENT DISTRICT AND THEIR NATURAL-GEOGRAPHICAL LOCATION

Annotation: *This scientific article comprehensively analyzes the issues of toponymy of villages located in the territory of Parkent district and their natural-geographical location. Toponyms are not only geographical place names, but also an important source of information expressing the historical memory, cultural traditions of the people and their interaction with nature. During the study, the origin, lexical meaning, phonetic form, historical roots of dozens of village names in the district, as well as the social, economic and natural factors involved in their formation, were studied in depth.*

The results of this study are of practical importance for use in local geographical education, regional development planning and tourism, and enrich the toponymic fund of Parkent district.

Keywords: *Geography, toponymy, history, Parkent, toponymic research, GAT*

Kirish

Toponimika – bu geografik joy nomlarini o‘rganadigan fan sohasi bo‘lib, u faqat joy nomlarini emas, balki ular orqali millatning tarixini, madaniyatini, dunyoqarashini ham yoritadi. Har bir toponim, xususan, qishloq nomlari xalqning tabiat bilan o‘zaro aloqasi, tarixiy voqealarga munosabati, o‘zining ijtimoiy hayotini qanday ifoda etganini bildiradi. Shuning uchun toponimlar geografik hududni o‘rganishda muhim madaniy-geografik indikator sanaladi.

Mazkur ilmiy maqolaning predmeti — parkent tumani qishloqlarining toponimiyasini chuqur o‘rganish, ularning nomlanishiga sabab bo‘lgan tabiiy, tarixiy va madaniy omillarni aniqlash, shuningdek, ushbu qishloqlarning tabiiy-geografik joylashuvi bilan toponimlar o‘rtasidagi bog‘liqlikni tahlil qilishdan iborat.

Tadqiqot obyekti sifatida toshkent viloyati parkent tumani tarkibidagi barcha qishloqlar, ularning geografik koordinatalari, relyefi, suv-havo sharoitlari, o‘simlik va hayvonot dunyosi, tarixiy rivojlanish bosqichlari hamda kartografik materiallar xizmat qiladi.

Maqolada kompleks yondashuv – ya’ni tarixiy-geografik, lingvistik-toponimik, kartografik va gat (geografik axborot tizimlari) asosidagi analizlar orqali toponimlar chuqur tahlil qilinadi. Shu bilan birga, joy nomlarining zamonaviy geografik makonda qanday ro‘l o‘ynashi ham e’tiborga olinadi. Har bir toponimning kelib chiqishi, tarixi va zamonaviy ahamiyati kontekstida yondashiladi.

Mavzuning dolzarbligi

Toponimik tadqiqotlar nafaqat nazariy-geografik bilimni chuqurlashtiradi, balki mahalliy identitetni mustahkamlash, tarixiy merosni saqlash, ekologik va turistik resurslarni to‘g‘ri rejalashtirishda ham katta ahamiyatga ega. Bugungi kunda parkent tumani turizm, ekologik boshqaruv va hududiy rivojlanish bo‘yicha muhim tumanlardan biri sifatida shakllanmoqda. Shu nuqtayi nazardan, bu hududdagi qishloqlar toponimiyasini o‘rganish dolzarb ilmiy va amaliy ahamiyatga ega.

Mavzu bo‘yicha qisqacha adabiyotlar tahlili

Mahalliy, ya’ni kichik hududiy birliklarning turli davrlardagi tarixini o‘rganishning lozimligini jahon tajribasi ham isbotlab bera oladi. Misol uchun, parkent tumanini olaylik. Toshkent vohasining toshkent viloyati qismiga kiruvchi va toshkent shahriga nisbatan sharqda joylashgan bu tumanning ham o‘ziga xos tarixi mavjud. Tumanning va undagi qishloqlarning nomlanish tarixi, ya’ni, toponomikasi, tumanda insonlar qaysi davrdan boshlab yashab kelayotganligi, tarixiy davrlardagi ahamiyati va yangi davr tarixidagi o‘rni haqida ham bir qator olimlar o‘z tadqiqot ishlarini olib borganlar yoki tadqiqot ishlarining bir qismida ta’kidlab o‘tganlar. S. Xusomiddinov, m.shermatov, s.qorayev, a. Hikmatov kabilar shular jumlasidandir. S. Xusomiddinov va m.shermatovlar o‘zlarining tadqiqot ishlarida tumaning geografik holati, tarixi va toponomikasi haqida atroflicha m’lumot nerib o‘tishgan. S. Qorayev esa, o‘z tadqiqot ishi davomida yurtimizning turli joylarining toponimlari qatorida parkent toponimlari haqida ma’lumot berib o‘tishgan. A. Hikmatov esa, tumanning yangi davrdagi holati haqida alohida to‘xtalgan.

Muhokama va natijalar

Parkent tumani parkent shahri va boshqizilsoy, bo‘ston, zarkent, nomadanak, so‘qoq, hisorak, changi, qoraqalpoq qishloq fuqarolar yig‘inidan iborat. Bu 9 ta qishloq ham o‘z navbatida mahallalardan tarkib topgan. Quyida ularning nomlari va toponomikasi haqida ma’lumotlar berib o‘tamiz.

Parkent shahri. Parkent tumanining markazi hisoblanib, Toshkent shahridan 48 km sharqda joylashgan. Umumiy yer maydoni 1648 gektarni tashkil etadi. Hududning asosiy aholisini o‘zbeklar tashkil etadi. Bundan tashqari bu hududda tojiklar, qozoqlar, qirg‘izlar, qrim tatarlari, qozon tatarlari ham yashaydi. Tuman markazida “Parkent dehqon bozori”, hokimiyat binosi, FHDYO binosi, Markaziy shifoxona, Tuman madaniyat va ma'naviyat markazi, 29-sonli Bolalar musiqa va san‘at maktabi, Prezident maktabi va tumandagi yagona xususiy maktab “Imkon school” va boshqa muhim ahamiyatga ega bo‘lgan markazlar joylashgan. O‘z navbatida tuman markazi bir qancha mahallalardan iborat. Parkent shahrida jami 19 ta mahalla joylashgan. Bular: Xo‘ja, O‘choq, Soy, Mozorhoji, Qo‘lichi, Surxi, Buloqboshi, Bo‘rsiliq, Samarobod, Navro‘z, Beshkappa, Oybek, Bodomtepa, Qo‘shshukur, Gulbog‘, Objuvoz, Istiqlol, Cho‘qqayma mahallalari hisoblanadi. Ulardan 6 tasi Parkentsoyning o‘ng qirg‘og‘ida joylashgan.Bular:

- Soy
- O‘choq
- Xo‘ja
- Qo‘lichi
- Mozorhoji
- Surxi mahallalaridir.

Soy mahallasi. Soy mahallasi Parkentsoyning o‘ng qirg‘og‘ida joylashgan bo‘lib, Qo‘lichi va O‘choq MFY lar hamda Changi qishlog‘i bilan chegaradosh. Mahalla 4 ta ko‘chadan iborat. Bular: Tanbalak, Tanbalak-2, Hamid Olimjon va Zarbuloq ko‘chalaridir. Bu ko‘chalarning ayrim qismlari O‘choq MFY hududiga ham tegishli.

“Soy” mahallasining mahalliy aholi orasidagi nomi “Tanbalak”. Hozirda u mahalla hududidagi ko‘chalardan birining nomi sifatida yuritiladi. “Soy” toponimining ma’nosi barchamizga ma’lum. Parkentsoyning qirg‘og‘i bo‘ylab joylashganligi uchun shu nom bilan atalganligi ravshan.Ammo mahalliy aholining so‘zlashuv tilida qolib ketgan “Tanbalak “nomining kelib chiqishi haqida aniq bir izoh mavjud emas. Mahalla faollarining so‘zlariga qaraganda, bu kim tomonidan va qachon shu nom bilan atalganligi to‘g‘risida ma’lumotlar hali mavjud emas.”Ak” toponim yasovchi qo‘shimcha ekanligini inobatga olsak, tanbal nomi nisbat berilgan bo‘lishi mumkin, deb tahmin qilsak bo‘ladi.

O‘choq mahallasi. O‘choq mahallasi Parkentsoyninng o‘ng qirg‘og‘ida joylashgan kichik mahalla bo‘lib, hududiy jihatdan Xo‘ja va Soy MFY lar bilan chegaradosh. Mahalla 6 ta ko‘chadan iborat bo‘lib,bular Tanbalak, Hamid Olimjon, Zarbuloq, O‘zbekiston, Tinchlik va Xo‘jaobod ko‘chalaridir.Yuqorida ta’kidlanganidek, ayrim ko‘chalar, aniqroq qilib aytganda, Tanbalak, Hamid Olimjon, Zarbuloq ko‘chalarining ayrim qismlari Soy MFY hududiga tegishli.

Mahallaning toponomikasi to‘g‘risida qiziq bir rivoyat bor. Mahalla nuroniylarining so‘zlariga qaraganda, muqaddas islom dini yurtimizda tarqala boshlagan kezlari, tahminan VIII asralarda Parkent hududiga sayyidlarning avlodlari bo‘lgan Sayyid ota Bobomochin otalar tashrif buyurishadi. Ular xalqa islomni o‘gatib, Haqni tanitadi va shu sababdan xalq orasida juda katta hurmat va e’tiborga sazovor bo‘lishadi. Kunlardan bir kuni Sayyid ota xalqdan o‘zi va oilasi uchun “o‘choqdekkina” joy so‘raydi va u insonga juda katta yerlar taklif qilinadi. Ammo Sayyid ota soy qirg‘og‘idagi uncha katta bo‘lmagan hududga joylashadi. Va shundan so‘ng Sayyid otaning “o‘choqdekkona“ degan iborasi xalq orasida mashhur bo‘lib, mahalla “O‘choq” nomi bilan ataladi. Mahalla ahlining so‘zlariga ko‘ra, bugungi kunda ham mahallaning aksariyat aholisi Sayyid otaning avlodlaridan hisoblanadi va mahalliy aholi o‘zini “xo‘jalar” deb ta’kidlashadi.

Xo‘ja mahallasi. Parkent shahrida joylashgan ushbu mahalla Parkentsoyning o‘ng qirg‘og‘ida joylashgan bo‘lib, huddiy jihatdan Mozorxoji, Qo‘lichi O‘choq va Buloqboshi MFY lar bilan chegaradosh. Mahalla 11 ta ko‘chadan iborat. Bular: Xo‘jaobod, Chamanzor, Ozodlik, Fidokor, Sohil, Hunarmand, Meros, Sohibkor, Ezgulik, Bog‘ichinor va Fayz ko‘chalaridir.

Mahallaning nomlanishi tarixi bo‘yicha xalq orasida shunday hikoya bor. 2017-2022-yilda mahalla oqsoqoli bo‘lgan Parpiyev Bahodir aka bizga bu to‘g‘risida hikoya qilib berdi. Aytishlaricha, islom dini yurtimizda tarqala boshlagach, Parkent tumani hududlariga islom dini arkonlarini yaxshi biladigan Bobo Mochin va Sayyid otalar so‘z yuritayotgan mahalla hududiga kelishgan. Ular mahalliy aholiga Haqni tanitgan va ilm ulashgan. Oxir-oqibat ular Parkentda qo‘nim topib, umrining so‘nggigacha ushbu hududlarda yashab qolishgan. Sobiq mahalla oqsoqoli Parpiyev Bahodir akaning so‘zlariga ko‘ra, o‘sha davrda Parkent aholisi ancha siyrak bo‘lgan, Bobo Mochin va Sayyid otadek sayyidlar, avliyolar esa Haqqa yaqinlashmoq uchun odamlardan yiroq bo‘lishni xohlaganlar. Bugungi kunda har ikki aziz zotlarning qabri ham ayni shu mahalla hududida joylashgan. Aslini

olganda, mahalliy aholi tilida “xo‘jalar” deb ataluvchi xalq Xo‘ja mahallasida ko‘pchilikni tashkil qilmaydi.

1-rasm. Xo‘ja mahallasi xaritasi[35]

Ammo. yuqorida nomlari zikr qilingan ikki buyuk shaxslar Bobo Mochin va Sayyid otalarining maqbaralari hurmatiga mahalla nomi ”Xo‘ja” deb atalgan. Bugungi kunda Bobo Mochin maqbarasining atrofida qabriston va Bobo Mochin nomi bilan ataluvchi jome masjid faoliyat yuritmoqda. Bugungi kunda ushbu masjid qayta tiklanmoqda.

O‘zbekiston Respublikasi Vazirlar Mahkamasining qarori bilan 2019-yil 4-oktyabrda Moddiy madaniy merosning ko‘chmas mulk obyektlari milliy ro‘yxatiga kiritilgan va davlat muhofazasiga olingan[36] .

Qo‘lichi mahallasi tuman markaziy maydonidan nisbatan shimoliy qismda joylashgan va Prakentsoy bilan bevosita tutashmagan. Shimoli g‘arbdan Bo‘ston qishloq fuqorolar yig‘ini tarkibidagi Bo‘ston qishlog‘i bilan chegaradosh. Mahalla 6 ta ko‘chadan iborat. Bular: Fayz, Xokko‘za, Sharq guli, Ezgulik, Zarqaynar va Bo‘zanjar ko‘chalaridir.

[35] Parkent tuman Kadastr agentligi ma’lumotlari asosida tayyorlandi

[36] „Moddiy madaniy merosning ko‘chmas mulk obyektlari milliy ro‘yxatini tasdiqlash to‘g‘risida O‘zbekiston Respublikasi Vazirlar Mahkamasining 2019-yil 4-oktyabrdagi 846-sonli qarori

Qo‘lichi toponimi to‘g‘risida ikki xil qarash bor. Ba’zilar bu mahalla hududida avval ko‘l bo‘lgan, aslida “Ko‘lichi” deb nomlanishi kerak deyishadi, yana ba’zilar bu hudud tuman markazidan ko‘ra pastda joylashgan va atrofi tepaliklar bilan o‘ralganligi uchun uzoqdan kaftning ichidek ko‘rinishi sababidan Qo‘lichi deb nomlangan deb aytishadi.

1.1-rasm Qo‘lichi mahallasi xaritasi[37]

Mozorxoji mahallasi Parkentsoyning o‘ng qirg‘og‘ida joylashgan bo‘lib,

hududiy jihatdan Surxi, Qo‘lichi va Xo‘ja mahallalari bilan chegaradosh. Mahalla 6 ta ko‘chadan iborat. Bular: Ozodlik, Sohil, Ma’mur, Nurchilar, Buloqboshi va Sag‘bon ko‘chalaridir.

Mahallaning toponomikasi haqida quyidagicha rivoyat bor. Ushbu rivoyat Xo‘ja va O‘choq mahallarining tarixi to‘g‘risidagi rivoyatlarga o‘xshaydi. Qachonligi noma’lum bo‘lgan asrda mahalla hududiga ilmli, ziyoli va haj safarini amalga oshirgan inson keladi va shu hududda qo‘nim topadi. Mahalliy aholiga o‘qish va yozishni o‘rgatadi va umrini ustozlikka bag‘ishlaydi. Vafot etgandan keyin mahlla hududiga dafn etiladi va hoji inson dafn etilganligi uchun hudud ramziy ravishda Mozorxoji deb atala boshlaydi. Mahalla nuroniylarining so‘zlariga ko‘ra avvallari uning maqabarasi soyning qirg‘og‘ida joylashgan bo‘lgan va sel oqizib ketishi natijasida vayron bo‘lgan.

[37] Parkent tuman Kadastr agentligi ma’lumotlari asosida tayyorlandi

1.2-rasm. Mozorhoji mahallasi xaritasi[38]

Surxi mahallasi Parkentsoyning o‘ng qirg‘og‘ida joylashgan bo‘lib, hududiyu jihatdan Boyqozon, Mozorxoji va Istiqbol mahallalari bilan chegaradosh.

Mahallaning nomlanish tarixi quyidagicha. Ssurxi mahallasi o‘rnida avvalari ko‘pgina tepaliklar bo‘lgan va oadmalt bu tepaliklarni surib tekislab joylasha boshlagan. Surilgan tepaliklarga nisbat berilib mahalla nomi Surxi nomi bilan mashhur bo‘lib ketgan.

1.3-rasm. Surxi mahallasi xaritasi[39]

Parkentsoyning chap qirg‘og‘ida joylashgan mahallalar soni esa 11 ta bo‘lib,bular quyidagilardir:

- Buloqboshi
- Bo‘rsiliq
- Samarobod
- Navro‘z
- Beshkappa
- Oybek
- Bodomtepa

[38] Parkent tuman Kadastr agentligi ma’lumotlari asosida tayyorlandi
[39] Parkent tuman Kadastr agentligi ma’lumotlari asosida tayyorlandi

- Qo‘shshukur
- Gulbog‘
- Objuvoz
- Istiqbol
- Cho‘qqayma
- Quruqsoy

Ushbu mahallalardan ayrimlari haqida quyida ma’lumotlar keltirilgan.

Buloqboshi mahallasi tuman markazidan sharqda va Parkentsoyning o‘ng qirg‘og‘ida joylashgan. Hududiy jihatdan mahalla Oybek, O‘choq, Samarobod, Nurobod va Bo‘rsiliq mahallalari bilan chegaradosh.

Mahallaning nomi mahalla hududidagi buloqning Parkentning ko‘pgina hududlarini suv bilan ta’minlashi hisobiga shunday atalgan. Bu mahallada o‘zbeklar bilan bir qatorda qozon tatarlari ham istiqomat qilishadi.

1.4-rasm. Buloqboshi mahallasi xaritasi[40]

Bo‘rsiliq mahallasi tuman markaziy maydonidan janubroqda joylashgan bo‘lib, hududiy jihatdan Qo‘shshukur, Beshkappa, Oybek, Buloqboshi, Samarobod va Navro‘z mahallari bilan chegaradosh.

Mahallaning toponimaksi haqida mahalliy aholi orasida quyidagi ma’lumotlar bor. Qadimda insonlar ko‘chib kelib bu yerlarni o‘zlashtirishdan avval bo‘rilar gala-gala bo‘lib yashagan joy hisoblangan. Dastlabki insonlar shu bo‘rilarni ko‘rib bu hududga bo‘ri silliq ya’ni silliq jungli bo‘rilar yashaydigan hudud deb nomlashgan. Shu tariqa bu nom mahalla nomiga asos bo‘lgan. Vaqt o‘tgan sari bu nom Bo‘rsiliq tarzida aytila boshlagan. Ehtimol, hududda bo‘rilar emas yovvoyi itlar yashagan bo‘lishi ham tahmin qilinadi.

[40] Parkent tuman Kadastr agentligi ma’lumotlari asosida tayyorlandi

1.5-rasm. Bo‘rsiliq mahallasi xaritasi.[41]

Objuvoz mahallasi Parkent tumanining muhim strategik markazida joylashgan bo‘lib, mahalla hududida Parkent dehqon bozori, hokimiyat binosi kabi muhim markazlar mavjud. Hududiy jihatdan Gulbog‘, Oybek, Buloqboshi va Cho‘qqayma MFY lar bilan chegaradosh. Mahalla 8 ta ko‘chadan iborat. Bular: Iste’dod, Qadriyat, Ichkiqo‘rg‘on, Bahor, Birdamlik, Rahshon, Do‘stlik va Alisher Navoiy ko‘chalaridir. Bular orasida Ichkiqo‘rg‘on ko‘chasi ayniqsa diqqatga sazovor bo‘lib, bu hududda qadimdan aholi yashab kelgan deb tahmin qilishadi. Tuman hokimiyat binosi ham shu ko‘chada joylashgan.

Mahallaning toponomikasi nisbatan yangi davrga borib taqaladi. Mahalla nuroniysi Zahro ayaning ma’lumotlariga ko‘ra, mahalla hududida avvallari yog‘ ishlab chiqaruvchi tegirmon, ya’ni juvoz bo‘lgan va kanopdan yog‘ olingan. Kanop mahalla hududiga Qiziltog‘(xalq orasidagi nomi Krasnagorsk) hududidan olib kelingan. Yog‘ olingach esa qolgan mahsulotdan chorva mollari uchun kepak tayyorlangan. Yog‘ olish jarayoni o‘ta soda tarzda, ya’ni ot va eshak yordamida

[41] Parkent tuman Kadastr agentligi ma’lumotlari asosida tayyorlandi

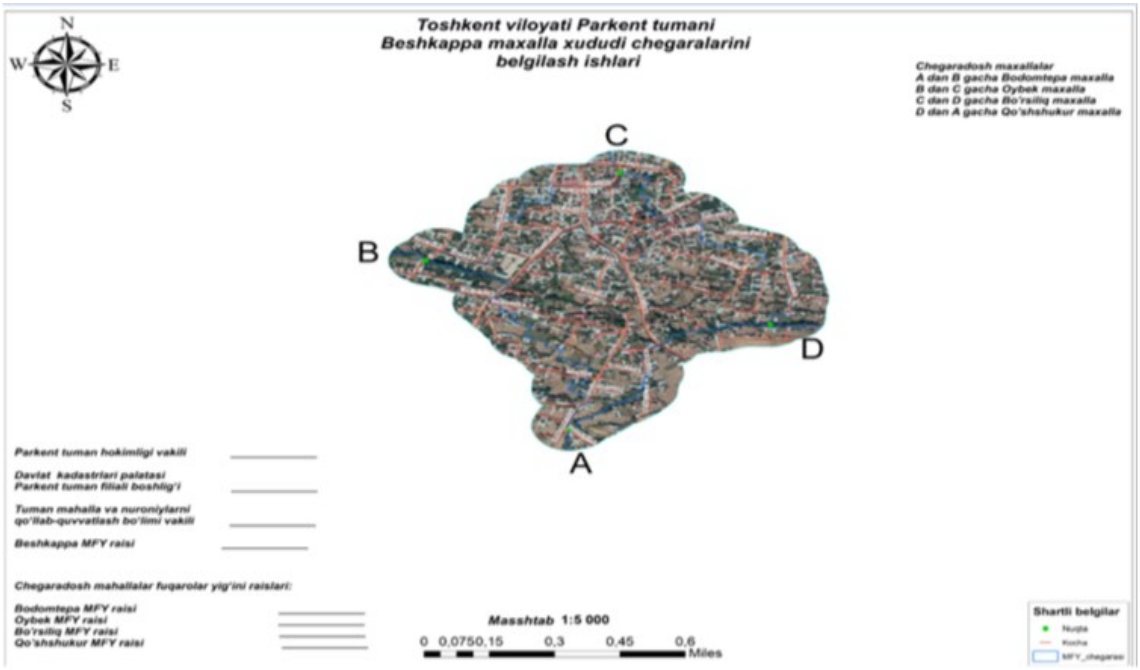
harakatlantirilib olingan va shu tariqa tumanning yog‘ga bo‘lgan talabini qondirganligiga nisbat berilib, mahalla nomi Objuvoz deb atala boshlangan.

1.6-rasm. Objuvoz mahallasi xaritasi.[42]

Beshkapa mahallasi tumanning markaziy maydonidan janubroqda joylashgan bo‘lib, hududiy jihatdan Bodomtepa, Oybek, Bo‘rsiliq va Qo‘shshukur mahallari bilan chegaradosh.

Mahallaning toponikasi haqida quyidagicha hikoya bor. Mahalla nuroniylarining so‘zlariga qaraganda, taxminan 160 yilcha muqaddam bu hududda Mirrajab, Mirsolih, Mirdadaxon, Mirabdulloh va Mirtolib ismli fuqarolarning vaqtincha yashash joyi – beshta kapasi qurilgan. Keyinchalik esa bu kapalar atrofiga aholi uy qurib ko‘chib kela boshlagan. Mahalla nomi shundan kelib chiqqanligi ta’kidlanadi.

[42] Parkent tuman Kadastr agentligi ma’lumotlari asosida tayyorlandi



1.7-rasm. Beshkapa mahallasi xaritasi[43]

Quruqsoy mahallasi tuman markazidan janubroqda joylashgan bo‘lib, hududiy jihatdan Bog‘bon, Cho‘qqayma, Bodomtepa va Qo‘shshukur mahallalari bilan chegaradosh.

1.8-rasm Quruqsoy mahallasi xaritasi[44]

Mahallaning nomlanish toponimkasi mahlliy aholining so‘zlariga ko‘rea,

avvallari mahlla joylashgan hududda soy o‘zani mavjud bo‘lgan va u vaqr o‘tib qurib qolgan. Quruq o‘zan o‘rniga esa aholi joylashgan shu sababdan mahalla nomi Quruqsoy nomi bilan atala boshlangan.

Boshqizilsoy qishloq fuqarolar yig‘ini. Uning tarkibiga Navdak, Nevich, Sanganak hamda Shampan qishloqlari kiradi.

[43] Parkent tuman Kadastr agentligi ma’lumotlari asosida tayyorlandi
[44] Parkent tuman Kadastr agentligi ma’lumotlari asosida tayyorlandi

Navdak qishlog‘i Parkentdan 22 km janubi sharqda Boshqizilsoyning chap sohilida joylashgan. Uning Navdak deb nomlanishi to‘g‘risida ikki xil qarashlar mavjud. Birinchi fikrga ko‘ra Navdak Yangi qishloq ma’nosini beradi. Nevichga nisbatan keyinroq tashkil topganligini bunga asos sifatida ko‘rsatishadi. Ikkinchi fikrga ko‘ra esa Tojikistonning Nav deb nomlangan qishlog‘idan ko‘chib o‘rnashgan aholi o‘z manzilgohni Navdak deb ataganligi e’tirof etiladi.

Nevich qishlog‘i Parkentdan 20 km janubi sharqda joylashgan Boshqizilsoyning o‘ng sohilida joylashgan. U ancha qadimiy qishloq hisoblanadi. Nevich qishlog‘idan qoyatosh rasmlar, petrogliflar topilganligi bunga dalil bo‘la oladi. Qishloqning toponomikasi haqida aniq ma’lumotlar yo‘q. Qishloqning asosiy aholisi tojik millatiga mansubligini inobatga olsak, bu toponim tojikcha atamaning o‘zgarib ketgan ko‘rinishi ekanligini tahmin qilish mumkin.

Shampan qishlog‘i Parkentdan 16 km janubi sharqda Sanganaksoy av Ugamsoyning oralig‘ida joylashgan. Qishloqqa 1947-yili asos solingan. Aholining so‘zlariga ko‘ra, urushdan keyin Shampan qishlog‘i hududida 35-40 xonadon yashagan. Rus hukumati esa bu hududga 1949-1950-yillarda qrim tatarlarini ko‘chirib olib kelgan. Yerlarining hosildorligi, uzumchilik yaxshi rivojlanganligi sababli Shampan qishlog‘iga Fransiyaning Shampan viloyatiga qiyosan shu nom berilgan. 1955-yilda Shampan qishlog‘ida vino ishlab chiqaruvchi zavod ishga tushirilgan.

Bo‘ston qishloq fuqarolar yig‘ini. Uning tarkibiga Bo‘ston, Achchisoy, Juduriq, Chavkanchak, Chotqol va Qirg‘izovul qishloqlari kiradi.

Bo‘ston qishlog‘i XX asrning 80-yillarida tashkil etilgan qishloq bo‘lib, uning nomi shu hududdagi shirkat xo‘jaligi nomidan olingan. Tuman markazidan 10 km shimoli g‘arbda joylashgan. Toponomikasi mahalliy aholining so‘zlariga ko‘ra, bahavo, chiroyli tabiatga ega bo‘lganligi bois, bog‘-u bo‘stonga qiyoslangani bois shunday nomlangan. Aholisining asosiy qismini qozoqlar tashkil qiladi

Juduriq qishlog‘i Parkentdan 21 km shimoli-g‘arbda joylashgan. Qishloq shu nomli soy bo‘yida joylashgan. Ko‘pgina soylar hudud nomidan kelib chiqqanligini inobatga olsak, Juduriq soyi Juduriq qishlog‘i nomidan kelib chiqqanligini tahmin qilsak bo‘ladi.

Juduriq nomi yuzuruq ya’ni shu nomdagi urug‘joylashganligi sababidan Yuzuruq deb nomlanganligi va keyinchalik so‘zlashuvda o‘zgarib ketganligi haqida ham ma’lumotlar bor.

Achchisoy qishlog‘i Parkentdan 14 km shimoli g‘arbda shu nomli soy sohilida joylashgan. Soy va qishloq nomi nima sababdan va qachon aynan shu nom bilan atalganligi haqida aniq ma’lumotlar mavjud emas.

Chavkanchak qishlog‘i Parkentdan 22 km shimoli g‘arbda joylashgan. Aholi ancha siyrak holatda yashaydi. 2006-yil ma’lumotlariga ko‘ra 580 kishi istiqomat qiladi. Bu qishloqda qozoq, qirg‘iz millatiga mansub aholi yashaydi.

Qishloqning toponimkasi haqida aniq ma’lumotlar yo‘q. Qirg‘iz yoki qozoqcha so‘z buzib talaffuz qilingan variant ekanligi tahmin qilinadi.

Qirg‘izovul qishlog‘i Parkentdan 13 km shimoli g‘arbda joylashgan. Aholisining asosiy qismini qirg‘izlar tashkil etgan. Qishloqning nomlanishiga ham shu asos qilib olingan.

Zarkent qishlog‘i. Parkentdan 12 km janubi-sharqda joylashgan. Zarkent eng qadimiy qishloqlardan biri hisoblanadi.Olimlarning fikrlariga ko‘ra, Zarkent hududida 2800-3000 yillar ilgaridan odamlar yashab kelishgan. Zarkent nomining toponomikasi to‘g‘risida bir qancha qarashlar bor. Mahalliy aholining so‘zlariga ko‘ra, Zarkent hududida avvaldan mashhur va mohir zararlar ko‘p bo‘lgan va “Zargarlar qishlog‘i” degan ma’noda Zarkent deb atalgan. Yana ba’zi fikrlarga ko‘ra Zarkent tog‘ qo‘ynidagi qishloq ma’nosini beradi.

Arab geografiaridan Muqaddasiy (X asr) o‘z asarida Shosh viloyatida tilga olingan Zarankent qishlog‘ini V.V. Bartold hozirgi Zarkent bo‘lishi mumkin, degan. etimologiyasi ma’lum. Agar zar “oltin” bo‘lsa, zer (zerin) “quyi”, “etak” degani. Zerinkat “pastdagi qishloq”, “tog‘ etagidagi qishloq” ma’nosini anglatadi[45].

Zarkentdagi Qalai Bolo shahristonida qazilmalar ishlari olib borish paytida, madaniy qatlamlari ning eng quyi qismning ostida kutilmaganda qadimiy madaniy qatlam aniqlangan. Qatlamda miloddan avvalgi VIII-VI asrlarda, ya’ni “Burgalik” madaniyati davriga xos sopol buyumlar topilgan[46]. Shuningdek, Bartold arab sayyohlarining asarlarida kelgan Zarankatu qishlog‘i hozirgi Zarkent qishlog‘i bo‘lishi mumkin ekanligini tahmin qiladi.

Nomdanak qishlog‘i. Parkentdan 16 km janubda joylashgan.Bu qishloq ham eng qadimiy qishloqlardan biri hisoblanadi. Bir qancha o‘rta asr geograflari asarlarida qishloq nomi qayd etilgan. Eskitepa deb nomlangan shahriston qoldiqlari topilgan. Nomdanak toponimikasining lug‘aviy ma’nosi “Mashhur” Sernam qishloq” ma’nosini beradi.

Nomdanak qishlog‘i dastlab Muqaddasiy asarida Namudonak tarzida tilga olingan. To‘g‘risi, Namdonak bo‘lsa, namdon – “sernam”, “sersuv”, “suv to‘planadigan joy” ma’nolarini ifodalab, -ak toponim yasovchi qo‘shimcha hisoblanadi[47].

Mahalliy aholining fikrlariga ko‘ra esa qishloq nomi o‘rikzor o‘rnida paydo bolgan qishloq degan ma’noni bildiradi. O‘rikzor esa bir danakdan ko‘karib chiqib katta o‘rikzorga aylangan , shuning uchun Nomidanak bo‘lib, keyin bu nom Nomdanakka aylanib ketgan

Parkent fuqarolar yig‘ini. Uning tarkibiga Boyqozon, Gulbog‘, Navbahor qo‘rg‘onlari va Samsarak qishlog‘i kiradi.

Boyqozon qo‘rg‘oni Parkentning g‘arbida joylashgan bo‘lib, tuman markazidan 2 km uzoqlikda joylashgan. Boyqozon toponomikasi avvaldan bu hududda qozoni doim qaynab turadigan, o‘ziga to‘q insonlar yashagani uchun shunday deb nomlangan deb tahmin qilinadi.

Gulbog‘ qishlog‘i Parkentdan 6 km g‘arbda joylashgan. Parkent Toahkent magistral yo‘lining chap tomonida joylashgan. Gulbog‘ning xalq tilida qolib ketgan

[45] S.QORAYEV TOPONIMIKA O‘zbekiston faylasuflari milliy jamiyati nashriyoti Toshkent — 2006. 137-bet
[46] Хусомиддинов. М. Шерматов. Паркент тумани. "O‘qituvchi" nashriyoti T-2006. 47-bet.
[47] O‘ZBEKISTON JOY NOMLARINING IZOHLI LUG‘ATI Birinchi nashrTOSHKENT 2022. 275-bet.

nomi Kultepa. Mahalliy aholining so‘zlariga ko‘ra, avvallari bu yerlarda tutzorlar bòlgan, chunki ko‘pchilik pilla boqib,tutni shoxlari shu yerlardan kesib ketilgan.Keyinchalik Parkentda pillachilik to‘xtatildi,bu yerlar sovxoz hisobidan o‘zlashtirila boshlaydi va tutzorlar yoqib yuboriladi.Katta trassa yo‘ldan o‘tib ketayotgan odamga kultepaga o‘xshab korinadi. Shuning uchun Kultepa degan nom mahalliy aholi so‘zlashuvida qolib ketgan. Bu yerga ”Gulbog‘” jamoa xo‘jaligining markaziy qo‘rg‘oni qurilishi munosabati bilan qishloq Gulbog‘ nomini olgan.

Navbahor qishlog‘i XX asrning 80-yillarida yangi yerlarni o‘zlashtirish hisobiga tashkil etilgan. Toponomikasining lug‘aviy ma’nosi “yangi bo‘ston” degan ma’noni anglatishi tahmin qilinadi.

Samsarak qishlog‘i Parkentdan 6 km janubda joylashgan. Bu qishloqning asosiy aholisi qozoq va o‘zbeklardan iborat. O‘rta asrlarda qishloq nomi Somsiyrak deb atalgan. Keyinchalik bu nom Samsarak sifatida o‘zgarib ketgan. Samsarak qishlog‘ida Otaxontepa nomi bilan ataluvchi arxeologik yodgorlik mavjud.

So‘qoq qishloq fuqorolar yig‘ini. Parkentdan 18 km janubi sharqda joylashgan. Qishloq o‘zining so‘lim tabiati, toza havosi bilan sayyohlarning e’tibor markazida. O‘rta asrlarda ham bu hududda zodagon qatlamlarning yozgi dam olish maskanlari borligi qayd qilingan. Ba’zi tarixchilarning fikrlariga ko‘ra Qang‘ davlatining yozgi poytaxti ham shu hududda joylashgan bo‘lishi mumkin. Qishloqning toponomikasi haqida turlicha qarashlar mavjud. Mahalliy aholining fikriga ko‘ra, So‘qoq so‘zi turkiycha – “yolg‘iz oyoq yo‘l”, arab tilida esa “kiyik yo‘li” degan ma’noni anglatadi.

So‘qoq — “suvi oq” yoki “so‘qmoq” so‘zlaridan olingan degan fikr bor. Tarixiy manbalarda So‘xoq shaklida tilga olingan. Farg‘ona vodiysidagi So‘x daryosi atrofidan ko‘chib kelganlar qishloqni So‘xak “Kichik So‘x” deb atagan bo‘lishlari mumkin[48].

Turk tilidagi so‘qmoq yo‘l sokak ham bu qishloq nomiga asos bo‘lgan bo‘lishi mumkin degan fikrlar mavjud.

Hisorak fuqorolar yig‘ini. Uning tarkibiga Hisorak, Kumushkon qishloqlari kiradi.

Hisorak qishlog‘i Parkentdan 8-10 km shimoli sharqda Parkentsoyning o‘ng sohilida joylashgan. Qishloqning so‘lim tabiati sababli turistik salohiyati yuqori. “Quyosh” majmuasi, “Sumcha” dam olish uyi maskanlariga tashrif buyuruvchilar ko‘pchilikni tashkil qiladi. Hisorak ancha qadimiy qishloq bo‘lib, tarixchi olimlarning fikricha, Hisorak aholisining dastlabki ajdodlari o‘z vaqtida Hisor tog‘lari etaklaridan ko‘chib kelgan bo‘lishi mumkin. Zarkent aholisi asosan tojik millatiga mansub bo‘lganligi uchun bu qishloqdagilarni “Hisoraki” - Hisordan ko‘chib kelganlar deb atashgan. Shu zaylda qishloqning toponimi vujudga kelgan.

Ammo mahalliy aholi tilida boshqacha rivoyatlar bor. O‘z davrida bu qishloqda yozgi saroylar, qarorgohlar bo‘lgan va podshohlar bu yerga eng sara, go‘zal qizlarni saroyda to‘plashgan degan fikrlar mavjud. Shunday keyin qizlar

[48] S.QORAYEV TOPONIMIKA O‘zbekiston faylasuflari milliy jamiyati nashriyoti Toshkent — 2006. 142-bet.

to‘planuvchi saroy, ya’ni – “Qizsaroy” nomidan Hisorak nomi kelib chiqqan deb ham hisoblashadi.

Kumushkon qishlog‘i Parkentdan 18 km shimoli sharqda Parkentsoyning o‘ng sohilida joylashgan qishloq. Tumanning yirik turizm markazlaridan biri. Qishloqning nomi o‘rta asrlarda kumush qazib olinganligi sababidan shunday nom olganligi tahmin qilinadi. Kumushkonning nomi o‘rta asrlardagi Ko‘hisim koniga ham qiyoslanadi.

Ko‘hisim – o‘rta asrlarda Shosh viloyatida qayd qilingan kon. Dastlab, arab geograflari Ibn Xudodbex, Istaxriy, Muqaddasiy asarlarida tilga olingan. Ko‘hisim – “kumush tog‘” demakdir. V.Bartold Ko‘hisim Ohangarondan janubda, Obliq qishlog‘i ro‘parasida bo‘lgan, deydi. Konning Shosh viloyatida bo‘lganini hisobga olsak, u Parkent tumanidagi Kumushkon toponimining o‘zginasidir. Haqiqatan ham, ruda jinslari orasida kumush bor[49].

Yana bir fikrga ko‘ra esa Kumushkondan kumush emas qo‘rg‘oshin qazib olingan. Qo‘rgoshinning tarkibida kumush rudasi ko‘pligi uchun shu nomning olgan bo‘lishi kerak deb ham tahmin qilinadi.

Changi qishlog‘i Parkentdan 4-6 km shimoli sharqda, Parkentsoy sohillarida joylashgan. Changi qishlog‘i ham qadimiy qishloq hisoblanib, uning ham nomlanishi to‘g‘risida turlicha qarashlar mavjud. Ba’zilar Changi so‘zi forschada “jangchi” degan ma’noni anglatadi, deb hisoblaydi. Jang mashg‘ulotlari shu qishloqda o‘tkazilib turilganligi va shuning uchun Jangchilar qishlog‘i deb atalgan deb hisoblashadi. Yana bor fikrga ko‘ra esa Changi aholisi azaldan chorvador xalq bo‘lganligi uchun, mol haydash jarayonida ko‘tarilgan changlar uzoqdan ko‘rinishi ham uning toponomikasiga sabab bo‘lgan bo‘lishi mumkin.

Qoraqalpoq qishlog‘i. Parkentning g‘arbida joylashgan qishloq bo‘lib, Toshkent Parkent magistral yo‘lining har ikki tomonida joylashgan. G‘arb tarafidan Yuqori Chirchiq tumani bilan chegaralangan.

Qishloqning tashkil topishi Chor Rossiyasi istilosi davriga to‘g‘ri keladi. Mahalliy aholining so‘zlariga ko‘ra bu yerda o‘sha davrda Toshkent guberniyasining pristavi yashagan va u qora rangli qalpoq kiyib yurgani uchun u yashagan qishloq Qoraqalpoq nomi bila atalgan bo‘lishi mumkin. Ammo hududda o‘z miqdorda qoraqalpoq millatiga mansub kishilar yashagani uchun shu nomning olgan bo‘lishi ham ehtimoldan holi emas. Bugungi kungacha bu qishloqning nomini asosli izohlovchi ma’lumotlar mavjud emas.

XULOSA

Tadqiqot natijalari shuni ko‘rsatadiki, Parkent tumani hududida joylashgan qishloqlar nomlari bejiz tanlanmagan bo‘lib, ularning har biri chuqur ma’no va tarixiy asosga ega. Qator qishloq nomlari – masalan, “Hisorak”, “Changi”, “Kumushkon”, “Soy”, “So‘qoq” kabi atamalar mahalliy aholi tomonidan o‘zining tabiiy muhitga, geografik xususiyatlarga, tarixiy voqealarga yoki muqaddas joylarga bo‘lgan munosabati asosida shakllangan. Bu esa Parkent hududi toponimiyasining boy, xilma-xil va chuqur tarixiy ildizlarga ega ekanini ko‘rsatadi.

[49]O‘ZBEKISTON JOY NOMLARINING IZOHLI LUG‘ATI Birinchi nashr TOSHKENT -2022 220-bet

Bu toponimik xususiyatlarni aniqlash va ilmiy asoslash hududiy identifikatsiyani mustahkamlash, mahalliy aholining o‘z tarixiga, yeriga bo‘lgan hurmatini oshirish, hamda hududiy rejalashtirish va turistik obyektlar xaritasini yaratishda katta yordam beradi. Shuningdek, bu tadqiqot natijalarini maktab geografiya ta’limida ham foydalanilishi mumkin.

Kelgusida bu yo‘nalishda yana chuqurroq statistik va GAT asosida raqamlashtirilgan toponimik xaritalarni ishlab chiqish, tarixiy hujjatlar asosida joy nomlarining o‘zgarish bosqichlarini tahlil qilish, va ularni zamonaviy raqamli platformalarda aks ettirish tavsiya qilinadi.

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O'RTACHO'L GEOEKOLOGIK MIKROZONASI LANDSHAFTLARINING EKOLOGIK HOLATINI BAHOLASH

Annotatsiya: *Ushbu maqolada tuproqlari o'rtacha sho'rlangan, kuchli antropogen o'zgartirilgan, yer osti suvlarining tabiiy drenaji nisbatan yaxshi bo'lgan, o'rtacha ifloslangan O'rtacho'l geoekologik mikrozonasining ekologik holati to'g'risida ma'lumot berilgan.*

Kalit so'zlar:*, Zirabuloq – Ziyovuddin tog' tizmalari, O'rtacho'l geoekologik mikrozona, provinsiya, okrug, rayon, deflyatsiya, sho'rtob, sho'rxok, tuproq, geoekologik mikrozona, ekologik muvozanat, rekreatsion resurs, buyra qamish, juzg'un.*

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ASSESSMENT OF THE ECOLOGICAL STATUS OF THE LANDSCAPES OF THE MID-DESERT GEOECOLOGICAL MICROZONE

Abstract: *This article provides information on the ecological state of the Middle Desert geoecological microzone with moderately saline soils, strongly anthropogenically altered soils, relatively good natural drainage of groundwater, and moderately polluted soils.*

Keywords: *Zirabulak-Ziyovuddin mountain range, Urtachul geoecological microzone, province, district, district, deflation, saline, solonchak, soil, geoecological microzone, ecological balance, recreational resource, curly reed, juzgun.*

In the context of current global climate change, special attention is being given to studying the impact of reservoirs in arid regions on the transformation of surrounding landscapes, assessing their ecological conditions, analyzing

recreational opportunities and their use, preserving biodiversity, and ensuring the sustainable use of these landscapes. In this regard, the study of the ecological condition of the landscapes of the Ortachol geoecological microzone is of great importance for conducting comprehensive research based on new scientific concepts aimed at maintaining landscape stability and promoting their effective utilization.

The region consists of low plains located in the southeastern part of Qiziltepa district. It is believed that the name "Ortachol" originates from its location between the vast steppes of Koktog, Malikchol, and Qarnabchol. The geoecological region is bordered by the Zirabuloq–Ziyovuddin mountain ranges to the northeast and south, while sloping gently towards the southwest in the direction of the Tudakoʻl reservoir, forming a flat intermountain area with varying elevations. It lies approximately 45 km southwest of Navoi city and 45–50 km northeast of Bukhara city, with absolute elevations ranging from 220 to 300 meters in the upper parts, gradually descending to around 220 meters near the Tudakoʻl reservoir. In ancient times, the Ortachol oasis—located between the Malik and Qarnob steppes—was known as a homeland for pastoral communities.

The relief varies from lowlands to uplands and is composed of sands and sandstones. The soils are suitable for cultivating all types of crops; however, due to the relief conditions, alfalfa is considered more appropriate compared to other crops.

The soil cover and types of the Ortachol massif are highly diverse, comprising gypsum-containing light loamy soils, sandy loams, and sands, with mixtures of coarse sand, gravel, and pebbles, underlain by sandstone and Neogene period deposits.

The gray-brown soils are of light loamy and sandy texture and contain weak to moderate amounts of coarse sand, gravel, and pebbles. In Ortachol, irrigated lands slope downward toward the Tudakoʻl Reservoir, with a difference in absolute elevation reaching up to 80 meters. As a result, vertical (downward) water erosion is more intense than lateral erosion. The areas adjacent to the Tudakoʻl Reservoir are experiencing increasing waterlogging and salinization. In these areas, the groundwater table has risen to 1–2 meters. Furthermore, gypsum-containing gray-brown soils occupy 77.8% of the area.

Suffosion processes are widespread in these areas — the dissolution of water-soluble salts has accelerated subsidence and collapse in some locations. Sandy desert soils (12.3%) are prone to water erosion, while saline soils account for 2.9%. The remaining 7–10% consists of other soils, partially including takyr (clay-crust) soils. In this geoecological microzone, one of the main objectives is to implement agrotechnical measures, establish protective forest belts to mitigate the effects of wind erosion and hot dry winds (garmsel), and improve the landʻs meliorative conditions.

In the irrigated areas of the Ortachol geoecological microzone, cultivated crops include cotton, wheat, barley, oats, flax, sesame, sunflower, maize, sorghum, and millet. The development of Ortachol began in 1973, following the launch of the Ortachol Canal. In the undeveloped parts of the region, wild plants such as tamarisk,

bermudagrass, mint, reed, saltwort, foxtail, saline bermudagrass, sedge, camelthorn, wild spurge, blueweed, and saxaul grow naturally.

There is an ancient mulberry tree that is 600 years old, with a diameter of over 1 meter. It is said that the remaining mulberry trees in the area were planted by a shepherd named Amonbobo from the village of Jaloir in Navoi. These mulberry trees are estimated to be around 80–100 years old, and about 30 head of cattle were once grazed in the area.

The current landscapes of Ortachol have undergone various geographic conditions over a long historical period and still retain natural features of past eras.

These inherited characteristics are among the key factors that determine the current landscape‘s stability, biological productivity, ecological quality, and overall economic and social potential. In the geoecological region, agrolandscapes and desert-oasis landscapes occupy a leading position.

In the past, the Ortachol massif was sparsely populated, inhabited only by a small number of shepherds who raised livestock. Wild animals such as wolves, foxes, hares, jackals, and goitered gazelles (gazelles) once inhabited the area. It should be noted that the fact that Ortachol is surrounded on all sides by mountains, saxaul thickets, riparian forests, and irrigation channels has created a favorable habitat for the survival of wild animals.

In the riparian forests and around water bodies in this area, bird species such as pheasants, sandpipers, and ducks can be found. Ortachol is considered a unique and favorable permanent habitat for various bird species. Birds such as sparrows, larks, starlings, golden orioles, shrikes, magpies, and hoopoes inhabit the Ortachol region. Among the reptiles in this massif are lizards, tortoises, water snakes, sand boas, skinks, desert monitor lizards, moles, and hedgehogs.

The region‘s climate, in general, exhibits subtropical characteristics and is classified as a sharply continental desert climate, with a significant deficit of natural moisture. Compared to atmospheric precipitation, the potential evaporation (approximately 1900 mm) exceeds it by 15–17 times.

For several centuries, Ortachol served as an excellent natural pastureland for livestock. However, due to land development, species such as red tulips, goitered gazelles, and jackals are disappearing. As a result of landscape transformation, many animals are abandoning their native habitats in search of new living environments in distant areas. The road is asphalt, but on both sides it runs through typical piedmont slopes and plains filled with proluvial deposits. Gravel quarries are common, and in many places, road conditions are substandard due to surface degradation.

Currently, due to excessive anthropogenic pressure, landscape productivity and pasture resource fertility have declined, leading to ecological impoverishment.

In order to address the problems in the Ortachol geoecological microzone, the following recommendations are considered appropriate:

•A comprehensive approach should be undertaken in the Ortachol geoecological microzone, with particular attention paid to environmental protection—especially soil conservation—ensuring that all activities comply with

established standards. Special focus must be given to the potential for secondary soil salinization and the likelihood of erosion processes occurring in gypsum-containing soils;

- In cooperation with the regional forestry department, shelterbelt plantations should be established to prevent wind erosion and mitigate the impact of hot, dry winds (garmsel);

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HAYOT FAOLIYATI XAVFSIZLIGI VA MEHNAT MUHOFAZASINING ASOSIY TARKIBIY QISMLARI HAMDA NAZORAT QILINADIGAN OB’EKTLARI TAHLILI

Annotatsiya: *Ushbu ishda hayot faoliyati xavfsizligi va mehnat muhofazasining asosiy tarkibiy qismlari hamda ular bilan bog‘liq nazorat qilinadigan ob’ektlar chuqur tahlil qilinadi. Xodimlarning mehnat faoliyatida duch kelishi mumkin bo‘lgan xavf-xatarlar, ishlab chiqarishdagi noxush holatlar va ularga qarshi kurashish choralari yoritilgan. Ishda hayotiy xavfsizlikni ta’minlovchi tizimlar, mehnat muhofazasiga oid normativ hujjatlar, texnik va tashkiliy tadbirlar, shuningdek, xavfsizlikni ta’minlashda muhim rol o‘ynaydigan nazorat va monitoring vositalarining ahamiyati yoritilgan.*

Kalit so’zlar: *Tekshirish ob’ektlari, xavf tahlili, sanitariya va gigiena talablari, mehnat qonunchiligi, texnika xavfsizligi, nazorat va monitoring.*

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ANALYSIS OF THE MAIN COMPONENTS OF LIFE SAFETY AND LABOR PROTECTION AND CONTROL OBJECTS

Abstract: *This paper provides a deep analysis of the main components of life safety and labor protection, as well as objects subject to control in this area. Potential hazards and emergencies that workers may encounter in the course of their work, as well as measures to prevent them, are highlighted. The paper examines systems that ensure life safety, regulatory documents on labor protection, technical and organizational measures, as well as the importance of control and monitoring tools that play an important role in ensuring safety.*

Keywords: *Control objects, risk analysis, sanitary and hygienic requirements, labor legislation, technical safety, control and monitoring.*

Bugungi kunda ishlab chiqarish jarayonlari va turli mehnat faoliyatlarida inson salomatligi hamda xavfsizligini ta’minlash dolzarb masalalardan biri

hisoblanadi. Har qanday mehnat faoliyatida yuzaga kelishi mumkin bo‘lgan xavf-xatarlarni oldini olish, ularni tahlil qilish va bartaraf etish hayot faoliyati xavfsizligi va mehnat muhofazasining asosiy vazifalaridandir. Ushbu sohada amalga oshiriladigan chora-tadbirlar nafaqat ishchi-xodimlarning sog‘lig‘ini muhofaza qilish, balki ish samaradorligini oshirishga ham xizmat qiladi. Shu nuqtai nazardan, hayot faoliyati xavfsizligi va mehnat muhofazasining tarkibiy qismlarini hamda ular bilan bog‘liq tekshirish ob’ektlarini chuqur o‘rganish muhim ahamiyat kasb etadi. Mazkur maqolada ana shu masalalar atroflicha tahlil etiladi.

Hayot faoliyati xavfsizligi va mehnat muhofazasi fanining asosiy mazmuni Hayot faoliyati xavfsizligi va mehnat muhofazasi predmeti turadi va uning asosiy tarkibiy qismlari quyidagicha keltirilishi mumkin:

Mehnat muhofazasi o‘zining vazifasi turlicha bo‘lganligidan ko‘p qismlarga bo‘lib o‘rganiladi. Bular asosan quyidagi bo‘limlardan iborat;

- mehnat muhofazasi qonunchiligi;
- ishlab chiqarish sanitariyasi va mehnat gigienasi;
- xavfsizlik texnikasi;
- elektr xavfsizligi;
- yong‘in xavfsizligi;
- yo‘l harakat xavfsizligi;
- birinchi tibbiy yordam ko‘rsatish.

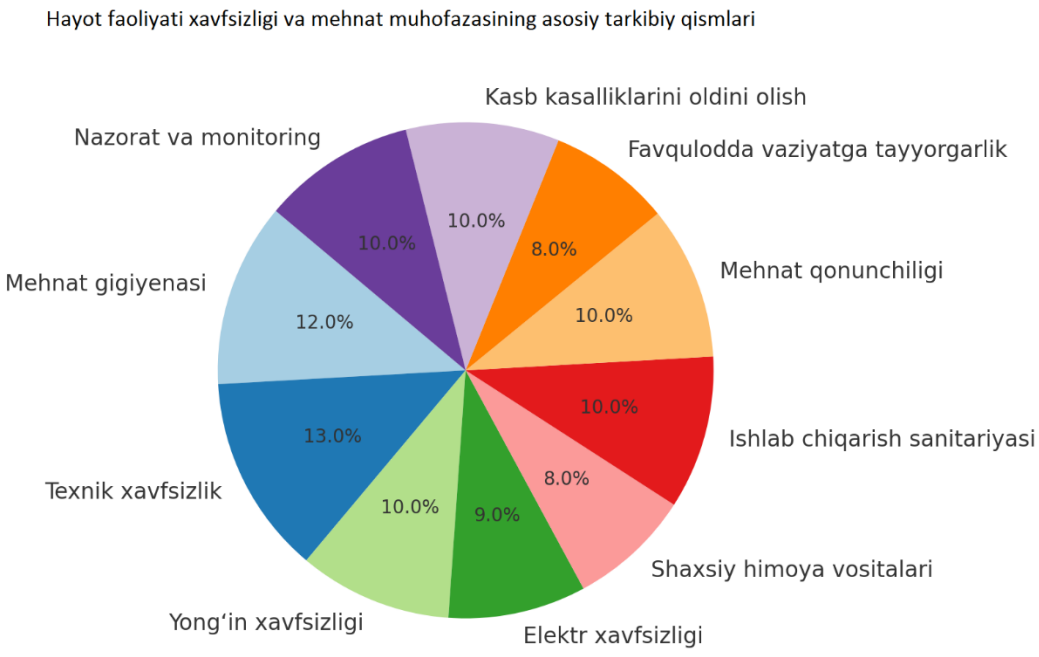
1-jadvalda hayot faoliyati xavfsizligi va mehnat muhofazasining tarkibiy qismlari va ularning nazorat ob’ektlari

№	Tarkibiy qism	Nazorat qilinadigan ob’ektlar	Izoh
1	Mehnat gigiyenasi	Ish joyidagi havo sifati, yoritish, shovqin, vibratsiya, harorat	Sog‘liq uchun zararli omillarni kamaytirish
2	Texnik xavfsizlik	Ishlab chiqarish uskunalari, texnologik jarayonlar	Avariya va texnika bilan bog‘liq hodisalarning oldini olish
3	Yong‘in xavfsizligi	Yong‘inga qarshi tizimlar, chiqish yo‘llari, o‘t o‘chirish vositalari	Yong‘in xavfi va uning oqibatlarini kamaytirish
4	Elektr xavfsizligi	Elektr jihozlari, kabellar, uzatkichlar	Elektr urish xavfini oldini olish
5	Shaxsiy himoya vositalari (SHHV)	Xodimlar foydalanayotgan himoya kiyimlari va jihozlari	Tana a’zolarini xavfli omillardan himoya qilish
6	Ishlab chiqarish sanitariyasi	Tozalik, chiqindilarni yo‘qotish, sanitariya-gigiyena holati	Infeksiyalar va kasalliklar oldini olish
7	Mehnat qonunchiligi va normativ hujjatlar	Ichki mehnat tartibi, xavfsizlik yo‘riqnomalari	Qonuniy mehnat muhofazasi talablariga rioya qilish
8	Favqulodda vaziyatlarga tayyorgarlik	Evakuatsiya rejalari, xavf tugmalar, o‘quv mashg‘ulotlari	Halokat holatlarida tez va to‘g‘ri harakat qilish uchun

№	Tarkibiy qism	Nazorat qilinadigan ob’ektlar	Izoh
9	Kasb kasalliklarini oldini olish	Tibbiy ko‘rik, monitoring, profilaktika tadbirlari	Xodimlarning sog‘lig‘ini saqlash
10	Nazorat va monitoring tizimlari	Ichki audit, xavfsizlikni baholash vositalari	Tizimli nazorat orqali xavf omillarini doimiy aniqlab borish

Mehnat muhofazasi qonunchiligi mehnat qilish va dam olishning huquqiy me’yorlarini o‘z ichiga oladi, hamda ularning himoya qilinishini kafolatlaydi. Bular asosan O‘zbekiston Respublikasi Konstitutsiya asosida ishlab chiqilgan O‘zbekiston Respublikasining mehnat Kodeksida XVI bob, 294 modda bilan ko‘rsatilgan. Korxona, tashkilotlarda Hayot faoliyati xavfsizligi va mehnat muhofazasi bo‘yicha XIII – bobda fikr yuritiladi.

Ishlab chiqarish sanitariyasi -ishlovchilarga ishlab chiqarishdagi zararli omillar ta’sir etishining oldini oluvchi tashkiliy, gigienik va sanitariya-texnikaviy tadbirlar hamda vositalar tizimidir. Bunda asosan korxona-tashkilotlar ishchi-xizmatchilarining o‘z sog‘liklarini saqlash, mustahkamlash yo‘lida sog‘lom mehnat sharoitlari yaratish ko‘rsatiladi. Mehnat gigienasi – tibbiyot fanining insonning ishlab chiqarish sharoitidagi mehnat faoliyatini o‘rganuvchi bir qismi. Bunga asoslangan holda korxona va tashkilotlarda ishlab chiqarish zararli omillarining ishlovchilarga ko‘rsatadigan ta’sirining oldini olish yuzasidan sanitariya-gigiena va davolash tadbirlari ishlab chiqiladi.



Xavfsizlik texnikasi-ishlovchilarga ishlab chiqarishdagi xavfli omillarning ta’sir etishini oldini oluvchi tashkiliy va texnikaviy tadbirlar hamda vositalar tizimidir.

E***lektr xavfsizligi-*** ishlovchilarga ishlab chiqarishdagi elektr tokining xavfi, uning inson organizmiga ta’sirini o‘rgatuvchi va xavfni oldini oluvchi tashkiliy va texnikaviy tadbirlar hamda vositalar tizimidir.

Yong‘in xavfsizligi (yoki profilaktikasi)-ishlovchilarni olovdan (yong‘in va portlashdan)himoya qilishga qaratilgan texnikaviy va tashkiliy tadbirlar kompleksidir.

Yo‘l harakat xavfsizligi-ishlovchilarga yo‘l qoidalari, turli transport vositalaridan foydalanish qoidalari hamda harakat xavfsizligiga qaratilgan texnikaviy va tashkiliy tadbirlar tizimidir.

Birinchi tibbiy yordam ko‘rsatish- korxona va tashkilotlarda sodir bo‘lishi mumkin bo‘lgan baxtsiz hodisalar, jarohatlanishlar, kasbiy kasalliklar yuzaga kelgan vaqtda jarohatlanishni to‘xtatish, imkoni bo‘lsa og‘riqni to‘xtatish yoki kamaytirish uchun bajariladigan chora-tadbirlar tizimi.

Mehnat muhofazasi bo‘yicha yuqorida keltirilgan bo‘limlar alohida o‘rganiladi.

Xulosa

Xulosa sifatida ta’kidlash lozimki, hayot faoliyati xavfsizligi va mehnat muhofazasi har bir mehnat faoliyatining ajralmas tarkibiy qismi hisoblanadi. Ushbu sohadagi ishlarni to‘g‘ri tashkil etish ishchi-xodimlar salomatligini saqlash, ishlab chiqarish samaradorligini oshirish va noxush hodisalarning oldini olishga xizmat qiladi. Tekshirish ob’ektlarini muntazam tahlil qilish, xavfsizlik talablariga rioya etilishini nazorat qilish, hamda ish joylarida zarur profilaktik tadbirlarni amalga oshirish orqali umumiy mehnat muhitini yaxshilash mumkin. Mehnat muhofazasining har bir tarkibiy qismi o‘zaro bog‘liq bo‘lib, ularni kompleks yondashuv asosida baholash talab etiladi.

Takliflar

1. Korxona va tashkilotlarda haftalik yoki oylik asosda xavfsizlik bo‘yicha ichki auditlar o‘tkazilishi yo‘lga qo‘yilsin.

2. Ish beruvchilar va xodimlar uchun hayot faoliyati xavfsizligi va mehnat muhofazasi bo‘yicha muntazam o‘quv-seminarlar tashkil etilsin.

3. Mehnat muhofazasi sohasidagi normativ hujjatlar amaldagi ish sharoitiga mos holda yangilanib borilishi zarur.

4. Xavf tahlili tizimini raqamlashtirish va zamonaviy monitoring texnologiyalarini joriy etish tavsiya etiladi.

5. Tekshirish ob’ektlari uchun yagona baholash mezonlari ishlab chiqilib, ular amaliy jarayonda qo‘llanilishi ta’minlansin.

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THE IMPORTANCE OF IMMOBILIZATION IN EMERGENCY CARE

Annotation: *This paper explores the critical role of immobilization in emergency medical care, focusing on its importance in the initial management of trauma patients. Immobilization is a fundamental procedure used to stabilize injured body parts, minimize pain, and prevent further tissue damage prior to definitive treatment. The study discusses various types of immobilization devices, such as splints, cervical collars, and spinal boards, and outlines the key principles and steps for proper application. Additionally, the paper highlights common mistakes that can occur during immobilization and emphasizes the need for comprehensive training of emergency responders. The preventive role of immobilization in reducing complications like nerve damage, internal bleeding, and further musculoskeletal injury is also examined. Through a detailed review of current practices and international protocols, the study underscores the life-saving potential of timely and accurate immobilization. The findings suggest that enhanced training, proper equipment, and adherence to standardized techniques are essential for improving outcomes in emergency trauma care.*

Keywords: *Immobilization, Emergency medical care, Trauma, Fracture, Dislocation, Spinal injury, Splint, Cervical collar, Backboard.*

Introduction

Emergency medical care plays a critical role in preserving life and minimizing long-term disability following trauma or acute injury. Among the key interventions in pre-hospital and early hospital settings is immobilization, the process of restricting movement of an injured body part to prevent further harm. Although it may seem like a simple step, immobilization is one of the most essential and potentially life-saving procedures performed in emergency care, especially in cases of fractures, dislocations, spinal injuries, or severe soft tissue trauma. When a traumatic injury occurs, any movement of the affected area can exacerbate the damage, leading to increased bleeding, nerve impairment, or further displacement of bones and joints. Immobilization helps to stabilize the injury, reduce pain and discomfort, prevent shock, and protect against additional internal or external trauma during transportation to a medical facility. It is often the first critical measure taken at the scene of an accident or injury before definitive treatment can be administered.

Moreover, proper immobilization is not only important for the physical well-being of the patient but also essential for enabling safe and effective transport. Emergency medical technicians (EMTs), paramedics, and even bystanders trained in first aid are required to have a clear understanding of immobilization techniques, including the use of splints, cervical collars, spinal boards, and other supportive

devices. In the context of modern emergency medicine, immobilization techniques have evolved significantly, supported by advances in materials, medical knowledge, and trauma response protocols. Despite these advancements, the core purpose of immobilization remains the same: to protect the patient from further harm while providing the best possible conditions for recovery. This article delves into the comprehensive role of immobilization in emergency care. It explores the indications for its use, the types of immobilization devices commonly employed, the principles behind their application, and the potential consequences of incorrect or delayed immobilization. Understanding the importance and proper application of immobilization can greatly enhance the quality of emergency care and contribute to better clinical outcomes for trauma patients.

Main part

Immobilization refers to the process of rendering a body part immobile to prevent movement after an injury. In emergency medical care, it is one of the first and most crucial steps. Its main goal is to stabilize the injured area, reduce pain, and prevent further damage. Immobilization can be temporary or long-term, depending on the injury. It is especially important in cases of fractures, spinal injuries, and dislocations. The concept is based on controlling movement to minimize internal or external complications. Immobilization devices vary from simple splints to advanced vacuum mattresses. Understanding this concept is essential for effective trauma response. Proper immobilization sets the foundation for successful recovery. Immobilization is indicated when there is suspected bone fracture, joint dislocation, or spinal cord injury. Any trauma causing severe pain, swelling, or deformity should be assessed for immobilization. It is also applied in cases of major burns involving joints to prevent contractures. Immobilization is essential in cases where movement can lead to internal bleeding or neurological damage. Road accidents, sports injuries, and falls are common scenarios. In multi-trauma patients, full-body immobilization may be required. Immobilization is a key part of the ABCDE trauma protocol. It is applied before transporting a patient to avoid worsening injuries. Quick and accurate assessment determines when immobilization is needed.

There are various immobilization devices used in emergency medicine depending on the injury location. Common types include rigid splints, soft splints, cervical collars, spinal boards, and vacuum splints. Rigid splints are used for stabilizing limb fractures. Cervical collars support the neck and prevent spinal cord injury. Backboards are crucial in immobilizing the spine during transport. Vacuum splints mold to the shape of the body and are ideal for irregular injuries. Pneumatic splints use air pressure to secure the limb. Each device must be chosen based on the injury type and severity. Correct application ensures maximum protection and comfort for the patient. Proper immobilization follows certain key steps to ensure effectiveness and patient safety. First, assess the injury and ensure the airway and circulation are stable. Explain the procedure to the patient to reduce anxiety. Then, gently support the injured area without causing movement. Select the appropriate immobilization device based on injury location. Secure the device without tightening too much to avoid circulation loss. Regularly monitor distal pulse and

sensation after immobilization. Ensure the limb is in a functional position if possible. Recheck immobilization during transport to maintain stability. Accurate documentation of the procedure is also important.

Immobilization plays a critical role in avoiding serious complications after trauma. It prevents bone fragments from causing further internal damage. By reducing movement, it minimizes bleeding and swelling in the injured area. It protects surrounding soft tissues, nerves, and blood vessels. In spinal injuries, immobilization is vital to prevent permanent paralysis. It also reduces the risk of developing compartment syndrome. Immobilization aids in pain management and keeps the patient calm. It supports early healing and decreases the chance of surgical complications. Overall, it lays the groundwork for safe transport and effective treatment. Improper immobilization can worsen the patient's condition and cause new complications. One common mistake is not checking for circulation before and after application. Applying the device too tightly can lead to ischemia or nerve damage. Failure to immobilize both the joint above and below a fracture is another frequent error. Moving the patient without proper spinal immobilization can result in spinal cord injury. Using the wrong device or incorrect technique leads to ineffective stabilization. Neglecting to monitor the immobilized area can allow unnoticed complications. These errors highlight the need for skill and care. Education and regular training help minimize such risks.

Training emergency medical personnel in immobilization techniques is crucial. Responders must recognize injuries quickly and apply the right device. Regular simulations and practical exercises enhance skill and confidence. Certification courses often include immobilization as a core component. First aid providers should also be trained in basic immobilization methods. Knowledge of anatomy helps responders position limbs correctly. Responders should carry a variety of immobilization tools in ambulances. Continuous education ensures up-to-date practices. A well-prepared team can perform immobilization effectively even under pressure. Their role is vital in improving trauma care outcomes. Immobilization remains a cornerstone of emergency medical intervention. Its ability to prevent secondary injuries, manage pain, and ensure safe patient transport is invaluable. With growing trauma cases worldwide, especially from road traffic accidents, the need for effective immobilization increases. Future developments may include smarter, self-adjusting splints or digital monitoring of limb conditions. More advanced training and global protocols can further improve outcomes. Emphasis should be placed on early education in first aid and public awareness. Overall, immobilization is not just a technique, but a lifesaving practice that must be respected and continually improved.

Discussion

Immobilization is a fundamental aspect of trauma care that bridges the critical moments between injury occurrence and definitive medical treatment. As explored, its primary role is to stabilize the injured area, prevent additional harm, and facilitate safe transport. The diversity of immobilization devices - from basic splints to spinal boards - reflects the wide range of injuries emergency responders face. However,

the true effectiveness of immobilization lies not only in the tools used but also in the skill, training, and judgment of the healthcare provider. Several factors influence the success of immobilization in emergencies. These include the accurate assessment of injury severity, the appropriate selection and application of devices, and the responder's ability to monitor patient status throughout transport. Furthermore, the importance of education and continuous training cannot be overstated. Inadequate application or failure to follow basic principles can lead to complications such as vascular damage, nerve compression, or worsening of fractures. As emergency care evolves, integrating new technologies and standardized protocols into immobilization practices can enhance patient outcomes significantly. Despite being a routine procedure, immobilization remains prone to errors if done without adequate knowledge. This underlines the need for reinforcing its principles not only among professionals but also among the general public trained in basic first aid. When immobilization is performed correctly and promptly, it contributes greatly to the overall efficiency of emergency medical services and can even be the deciding factor between recovery and permanent disability.

Conclusion

In conclusion, immobilization plays a vital and often lifesaving role in emergency medical care. It serves as a critical step in the early management of trauma, ensuring that injuries are contained and not worsened during the crucial pre-hospital phase. Through the proper use of immobilization techniques and devices, medical responders can significantly reduce pain, limit complications, and improve patient stability during transport. To maximize its benefits, continued emphasis must be placed on proper training, practical skill development, and adherence to updated protocols. Future advancements in materials and techniques promise to make immobilization even more effective and accessible. Overall, understanding and implementing correct immobilization is essential for every emergency responder and should remain a core component of trauma care education and practice.

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DIGITAL MARKETING: AN INTEGRAL PART OF MODERN BUSINESS

Abstract: *This article examines the role and importance of digital marketing in modern business, especially from the perspective of the Uzbek market. The main types, advantages and applications of digital marketing for local businesses are analyzed. It also identifies factors that hinder the development of digital marketing in the local market, including the lack of qualified specialists and infrastructure limitations. Based on the research results, practical recommendations are given for optimizing digital marketing strategies for small and medium-sized businesses.*

Keywords: *Digital Marketing, Social Media Marketing (SMM), Search Engine Optimization (SEO), Contextual Advertising (PPC), Content Marketing, Email Marketing.*

Introduction. Digital marketing plays an important role in the modern business world. Due to the rapid development of the Internet and digital technologies, companies have gained new opportunities in promoting their products and services. Digital marketing is an effective tool not only for strengthening relationships with customers, but also for expanding the brand's market share and increasing profits. This article discusses the main aspects, advantages and role of digital marketing in modern business. "Digital marketing is the use of digital technologies to reach customers."[50] Digital marketing is the process of using digital channels and technologies to promote products or services. It includes tools such as social networks, search engines, email marketing, websites and mobile applications. Unlike traditional marketing, digital marketing allows for real-time data analysis and interactive communication with customers. The main types of digital marketing are:

1. Social Media Marketing (SMM): Advertising and content creation on platforms such as Instagram, Facebook, LinkedIn.
2. Search Engine Optimization (SEO): Getting your website to rank higher on search engines such as Google.
3. Pay Per Click (PPC): Paid advertising through Google Ads.
4. Content Marketing: Engaging your audience with useful and engaging information.
5. Email Marketing: Sending personalized offers to your customers.

The importance of digital marketing for modern business is reflected in a number of its advantages: Wide audience: The Internet is a global platform, allowing you to promote your product anywhere in the world. Cost-effective: Compared to

[50] "Interaktiv va raqamli marketing" Z.A.Xakimov, U.U.Sharifxodjayev. Toshkent – "Iqtisodiyot"- 2020. 12-page

traditional advertising (television, radio), digital marketing allows you to achieve big results with a small budget.

1. Measurable results: Using tools like Google Analytics and Facebook Insights, you can track the effectiveness of your advertising campaigns in real time.

2. Personalization: Digital marketing helps you analyze customer behavior and provide personalized offers.

3. Rapid adaptability: Digital platforms allow you to quickly change and update campaigns.

Today, digital marketing is one of the factors influencing the success of any business. Companies from small startups to large corporations are using digital marketing in their strategies. This is necessary not only to sell products, but also to increase brand awareness, strengthen customer loyalty and get ahead in the market competition. For example, digital marketing is also developing rapidly in Uzbekistan. Local brands are active on social networks, promoting their products on Instagram and Telegram. At the same time, they are increasing their competitiveness in local markets with the help of SEO and contextual advertising.

As technology advances, digital marketing is also changing. Artificial intelligence (AI), big data (BIGs), and machine learning are making advertising more accurate and effective. New technologies such as virtual and augmented reality (VR and AR) are enabling new ways to engage with consumers. And with the growing influence of social media, brands are seeking to connect with their audiences in a more intimate and engaging way. Digital marketing is the heart and soul of modern business. It not only allows companies to effectively communicate with their customers, but also opens up endless opportunities to increase competitiveness in the market. In emerging markets like Uzbekistan, digital marketing has become a key growth driver for small and medium-sized businesses. By using technology correctly and constantly updating, any company can achieve success with digital marketing.

Literature review. Research in the field of digital marketing has grown significantly in recent years, further increasing its importance in modern business. Kotler and Keller (2022) in their work “Marketing Management” emphasize the flexibility and effectiveness of digital marketing compared to traditional marketing methods. They believe that the ability to analyze data in real time through digital platforms allows businesses to identify customer needs more quickly and provide them with appropriate offers.

Also, Chaffey and Ellis-Chadwick (2019) in their book “Digital Marketing” consider the integration of tools such as content marketing and SEO to be essential for the success of digital marketing strategies. They particularly recognize the role of social media marketing (SMM) in building trusting relationships with consumers. At the same time, Ryan (2020) in his work “Understanding Digital Marketing” emphasizes the importance of digital marketing as a cost-effective and effective solution for small and medium-sized businesses.

Local research in Uzbekistan also shows the growing importance of digital marketing. For example, a 2024 study by the Tashkent State University of

Economics noted the activeness of local brands in communicating with customers through social networks, and the leading role of the Telegram and Instagram platforms in this process. However, the full potential of digital marketing in local markets is still not fully utilized, which indicates that there are great opportunities in the future.

This literature review helps to determine the importance of digital marketing on a global and local scale and its future development directions. Research shows that digital marketing is constantly evolving, enriched with new technologies and strategies.

Research methodology. This article uses a combination of qualitative and quantitative research methods to examine the role of digital marketing in modern business. The main objective of the study is to analyze the advantages, challenges, and practical applications of digital marketing in the Uzbek market. Literature review: A theoretical framework was created by analyzing international and local literature on digital marketing. In this process, sources such as Google Scholar, JSTOR, and local academic journals were used. Data analysis: Social media activity, SEO results, and PPC campaign statistics were analyzed to assess the effectiveness of digital marketing campaigns in Uzbekistan. The online activity of local brands was studied using tools such as Google Analytics and SimilarWeb. Case studies: The digital marketing strategies of a number of small and medium-sized businesses in Uzbekistan were studied. For example, campaigns conducted by local restaurants and online stores on Instagram and Telegram were analyzed. Interviews and surveys: Semi-structured interviews were conducted with digital marketing specialists and local business representatives. Through this, their experiences and challenges in using digital marketing were identified.

Relevance and results of the research. The importance of digital marketing in modern business is growing in the global economy, and especially in emerging markets like Uzbekistan. The growth in the number of Internet users (according to 2024 data, the number of Internet users in Uzbekistan exceeded 20 million) and the widespread use of social networks are opening up new opportunities for businesses. At the same time, the effectiveness of traditional marketing methods is decreasing, and the demand for digital platforms is increasing. The relevance of the study is based on the following factors:

1. Technological development: Technologies such as artificial intelligence, big data, and automation are making digital marketing more effective.

2. Local market specificity: Digital marketing is not yet fully exploited in the Uzbek market, which makes its study and application a pressing task.

3. Increased competition: Digital marketing for small and medium-sized businesses (SMEs) provides competitiveness in the market as a cost-effective and effective tool.

4. Changes in customer behavior: Most consumers are searching for information about products and services through online platforms, which increases the need for digital marketing strategies.

As a result of the research, the following main conclusions were drawn regarding the current state of digital marketing in the Uzbek market and its importance for businesses:

1. The leading role of social networks: Instagram and Telegram stand out as the main platforms for digital marketing in Uzbekistan. More than 70% of local businesses are active on these platforms, and they are an effective and affordable tool, especially for small and medium-sized businesses.

2. SEO and PPC effectiveness: Businesses that used SEO strategies in the local market increased website traffic by an average of 40%. Contextual advertising campaigns conducted through Google Ads allowed to increase the return on investment (ROI) by 3-5 times.

3. The impact of content marketing: Useful and engaging content (such as videos, infographics, and blog posts) played a significant role in increasing customer trust. Surveys conducted during the study showed that 65% of consumers are more loyal to brands that provide useful information.

4. Local Challenges: There are some obstacles to the development of digital marketing in Uzbekistan, including a lack of qualified specialists, limited internet infrastructure, and low digital marketing knowledge among local businesses.

5. Future Opportunities: The study showed that artificial intelligence-based tools (such as automated advertising platforms) and mobile applications will play an important role in the next phase of digital marketing in the Uzbek market.

Conclusion and suggestions. Digital marketing has become an integral part of modern business, and its importance is growing in emerging markets like Uzbekistan. The study showed that tools such as social media, SEO, and contextual advertising are effective for local businesses, providing competitiveness in the market for small and medium-sized enterprises. However, challenges such as the lack of qualified specialists and the low level of knowledge about digital marketing are hindering development. Based on the results of this study, the following recommendations are put forward:

• Training qualified personnel: Uzbekistan needs to expand digital marketing training programs and certification courses. Universities and private educational institutions should focus on providing practical knowledge in areas such as SMM, SEO, and content marketing.

• Infrastructure development: The effectiveness of digital marketing campaigns can be increased by improving the speed and coverage of the Internet. This is especially important in rural areas.

• Support for small businesses: The state and private sectors should introduce grants and subsidies for digital marketing for small and medium-sized businesses. This will allow them to increase their activity on social networks and be competitive on online platforms.

• Use of AI and Big Data: Local businesses should introduce tools based on artificial intelligence and big data analysis. This will make advertising campaigns more accurate and personalized.

• Development of local platforms: It is recommended to increase investments in creating digital marketing platforms and applications specific to Uzbekistan to reduce dependence on Telegram and Instagram.

Digital marketing is a key factor not only for current success but also for future growth for Uzbek businesses. When these proposals are implemented, the local market will be able to harness the full potential of digital marketing and strengthen its position in the global competition.

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THE ESSENCE, CONTENT AND FUNCTIONS OF HUMAN RESOURCE MANAGEMENT

Abstract: *This article is devoted to the analysis of the essence, content and functions of the field of human resource management (HRM). The study examines the theoretical foundations of HRM and analyzes its main functions, such as employee recruitment, training, motivation and career development. The article serves to explain to students the role of HRM in the modern labor market and suggests directions for future research.*

Keywords: *Human resource management, HRM functions, employee engagement, motivation, Training and development, career management, organizational strategy, labor market, performance appraisal.*

Introduction. In the 21st century economy, it is becoming increasingly clear that human capital is a key factor in the success of an organization. Therefore, human resource management (HRM) plays an important role in achieving the strategic goals of the organization. Human resource management (HRM) is recognized as one of the main factors of success in modern organizations. The competence, motivation and efficiency of employees are crucial in achieving the strategic goals of the organization. The essence of human resource management is to increase the competitiveness of the organization through the effective management of human capital within it. This article is devoted to the study of the theoretical and practical aspects of human resource management, highlighting its content, essence and functions. The field of HRM was formed as an independent discipline at the end of the 20th century, and today it has become an integral part of strategic management in organizations. The term "human resources" was first used in science and management practice in the USA and Great Britain in the 1970s, and then in other countries with developed market economies. According to Armstrong (2014), "Human resource management (HRM) is concerned with all aspects of the employment and management of people in organizations. It encompasses strategic HRM, human capital management, knowledge management, corporate social responsibility, organizational development, resourcing (workforce planning, recruitment and selection, and talent management), learning and development, performance and reward management, employee relations, employee well-being, and employee service activities."

HRM is a strategic and integrated approach to effectively managing an organization's most valuable asset, its employees. The main goal of HRM is to realize the potential of employees, increase their motivation, and thereby ensure the competitiveness of the organization. HRM focuses not only on managing the

administrative aspects of employees, but also on their development, training, motivation, and retention. This means accepting employees as a strategic resource of the organization and realizing that their success directly affects the success of the organization. The content of HRM includes the following elements: Strategic alignment, integration, humanization, development, motivation, retention, and labor relations. Strategic alignment: this means that HRM policies and practices are fully consistent with the overall strategy and goals of the organization. That is, all HRM actions should be aimed at achieving the main goals of the organization. For example, if an organization aims to enter a new market, the HRM should focus on finding, training, and developing employees who are suitable for working in the new market.

Integration: All functions of the HRM (recruitment, training, evaluation, motivation, etc.) should be interconnected and coordinated. A change in one function will affect other functions. For example, a performance appraisal system should help identify needs for employee training and development.

Humanism: HRM's policy is to treat employees with respect, fairness, and equality. The well-being, values, and needs of employees are taken into account. This helps to increase employee satisfaction, strengthen their loyalty, and create a positive image of the organization.

Development: HRM implements programs aimed at improving the knowledge, skills, and abilities of employees. This helps to develop employees' careers, prepare them for new roles, and meet the future needs of the organization. Development increases employee motivation and strengthens their commitment to the organization.

Motivation: HRM uses various methods to increase employee enthusiasm for work and motivate them to perform well. These include material incentives (monthly salary, bonuses), non-material incentives (recognition, praise), increasing the interest and responsibility of work. Motivated employees show high productivity and contribute significantly to achieving the goals of the organization.

Retention: The goal of HRM is to retain highly qualified and experienced employees in the organization. To do this, employees are provided with a good working environment, competitive salaries, development opportunities and career growth. Retention helps reduce costs, preserve knowledge and experience, and ensure the sustainability of the organization.

Labor Relations: HRM aims to establish healthy and constructive relations between employees and management. This includes compliance with labor laws, resolving labor disputes, cooperating with labor unions, and ensuring occupational safety and health. Good labor relations increase employee job satisfaction, reduce conflicts, and improve organizational efficiency.

These above elements provide the organization with significant advantages such as higher productivity, competitiveness, cost reduction, positive work environment, achievement of strategic goals and sustainability. Therefore, organizations should focus on HRM and adopt it as a strategic priority.

In today's competitive business world, human capital is the most valuable asset of an organization. Therefore, human resource management (HRM) plays a key role in achieving the strategic goals of the organization. The main functions of HRM cover all processes related to employees of the organization and ensure their effective management. The first and most important function is recruitment and selection. The goal of this process is to find the most suitable candidates for the organization. The best candidates are selected by planning jobs, advertising vacancies, screening resumes, conducting interviews and conducting tests. Properly selected employees create the foundation for the success of the organization. The second important function is training and development. This function is aimed at improving the knowledge and skills of employees. Through training, seminars, consultations and career planning programs, the skills of employees are improved. This not only helps employees develop themselves, but also serves to increase the efficiency of the organization and support innovation. The third function is performance management. This includes setting goals for employees, evaluating their performance, providing feedback, and encouraging them. This process increases employee job satisfaction, increases their motivation, and increases productivity. The fourth function is motivation and reward. This function is aimed at creating a fair system of remuneration and incentives for employees' work. Employees are treated fairly for their work through monthly salaries, bonuses, benefits and additional benefits. This increases employee loyalty to the organization and motivates them to achieve greater results. The fifth function is labor relations management. This is aimed at establishing healthy and constructive relations between employees and the organization. A good working environment is created by resolving labor disputes, listening to employees' opinions, ensuring occupational safety and cooperating with trade unions. The sixth function is HR analytics. This involves collecting, analyzing and using data in the field of HRM. By studying employee-related data, the organization can improve its HR strategy, increase efficiency and identify problems early. All HRM functions include all processes of the organization related to employees. The effective functioning of these functions helps to realize the potential of the organization's employees, increase their motivation, improve work efficiency and achieve overall results. Therefore, in modern business, HRM is not only important, but also a decisive factor for the long-term success of the organization.

The purpose of this article is to explain the strategic importance of the field of human resource management (HRM) in modern organizations through a comprehensive analysis of its essence, content and functions. The article aims to study the theoretical foundations of HRM, highlight its main functions (employee recruitment, training, motivation, career development, etc.) and show their impact on the competitiveness of the organization. The article also aims to reveal the practical aspects of HRM and its role in the modern labor market, as well as suggest directions for future research.

Literature analysis and methods. Research and literature on human resource management (HRM) have extensively covered the theoretical and practical aspects

of this field and highlighted its importance in the success of organizations. Below is a review of the literature used in the article and used as a basis for explaining the essence, content and functions of HRM.

Gulnora Abdurakhmonova's textbook "Human Resource Management", Michael Armstrong and Stephen Taylor's "Armstrong's Handbook of Human Resource Management Practice" (2014) is one of Armstrong's most important guides in the field of HRM. The author describes HRM as an integral part of strategic management and explains its functions in detail. The book analyzes aspects such as recruitment, training, motivation, performance appraisal, and labor relations in detail. Armstrong's approach emphasizes the alignment of HRM with the organization's strategy and the realization of employee potential. This source was used as the main literature in the article to formulate the theoretical foundations of HRM. Boxall, P., & Purcell, J. (2016). Strategy and Human Resource Management - This work by Boxall and Purcell provides an in-depth analysis of the strategic role of HRM. The authors emphasize the importance of integrating HRM policies and practices with the organization's overall strategy. The book provides examples of how employee motivation, development, and retention affect an organization's competitiveness. This source has made a significant contribution to the article in explaining the concepts of strategic fit and integration. In addition, the works of authors such as Torrington, D., Hall, L., Taylor, S., & Atkinson, C. (2017). Human Resource Management, Bratton, J., & Gold, J. (2017). Human Resource Management: Theory and Practice, Storey, J. (2007). Human Resource Management: A Critical Text were also analyzed.

Relevance and results of the research. In the modern world, human resources are one of the most important assets of an organization. Increased competition in the global economy, technological changes, and dynamic changes in the labor market are placing new demands on the field of HRM. For organizations, studying HRM not only expands future career opportunities, but also prepares them to lead in modern organizations. The relevance of this study, dedicated to the field of human resource management (HRM), stems from the crucial role of human capital in the success of an organization in the modern economy and competitive business environment. The competitiveness of organizations in the 21st century is directly dependent on the skills, motivation, and productivity of employees, and HRM is emerging as an important tool in achieving the strategic goals of the organization by effectively managing these factors. Changes in the global labor market, technological innovations, the needs of a new generation of employees, and dynamic changes in the work environment require HRM to develop new approaches and strategies. The relevance of the study also stems from the strategic importance of HRM in organizations, not only in performing administrative tasks, but also in realizing the potential of employees, ensuring their well-being, and supporting the long-term sustainability of the organization. In particular, in developing economies such as Uzbekistan, the issue of adapting HRM practices to modern standards and integrating them into the characteristics of the local labor market remains relevant. This study is important for managers in terms of understanding the theoretical and

practical aspects of HRM, preparing them for labor market requirements, and creating a basis for future research.

This study explores the theoretical foundations and practical aspects of HRM to reveal its strategic importance in modern organizations. The results of the study show that HRM is not limited to administrative management of employees, but also serves to realize their potential, increase their motivation, ensure their well-being and contribute to the long-term sustainability of the organization. In particular, HRM functions such as recruitment, training, performance appraisal, incentives and labor relations management are important in improving organizational effectiveness. The study also shows that HRM can be made more effective by adapting to the local context, using digitalization and HR analytics. These results provide guidance to managers in formulating HRM strategies that meet the requirements of the modern labor market and suggest new directions for future research.

Conclusion and suggestions. Human resource management (HRM) plays a crucial role in the success of modern organizations and helps to achieve the strategic goals of the organization through the effective management of human capital. The study examined in detail the main functions of HRM, such as employee recruitment, training, motivation, performance management, incentives, labor relations management and HR analytics. These functions make a significant contribution to increasing the competitiveness of the organization, realizing the potential of employees and creating a positive work environment. HRM is a strategic approach aimed not only at performing administrative tasks, but also at ensuring the development, well-being and long-term sustainability of employees. This study provides important guidance in understanding the theoretical and practical aspects of HRM, preparing for the modern labor market and expanding future career opportunities.

Suggestions. The following suggestions will help organizations implement HRM more effectively and increase its strategic relevance, while creating a conducive environment for learning modern HRM practices and applying them in their future operations.

Adapting HRM practices to the local context: Modern organizations should focus on adapting their HRM strategies to local labor market characteristics and cultural factors, ensuring a balance between the needs of local employees and the goals of the organization.

Using digitalization and HR analytics: Organizations should implement HR analytics and AI-based tools to analyze employee data and improve decision-making processes. This will help increase efficiency and identify problems early.

Expand employee training and development programs: Organizations should implement ongoing training and career development programs to ensure that employees continue to learn and acquire new skills. This increases employee motivation and strengthens the organization's innovative capacity.

Practical learning opportunities for students: Higher education institutions should expand internship and project-based learning programs in collaboration with

organizations to increase practical knowledge of HRM. This will better prepare students for the demands of the labor market.

Future research directions: Further research in the field of HRM should focus on studying the needs of a new generation of employees, adapting HRM practices in remote work environments, and analyzing the impact of artificial intelligence on HRM processes.

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VARIKOZ KASSALIGINI DAVOLASHDA FITOTERAPIYA VA ZAMONAVIY INVAZIV USULLARNING O'ZARO INTEGRATSIYA QILISH

Annotatsiya: *Ushbu maqolada variko'z kasalligining etialogiyasi va patofizologiyasini chuqur tahlil qilish orqali, ushbu kasallikni davolashda fitoterapiya va zamonaviy endovenoz davolash usullarini taqqoslash hamda samaradorligini tahlil qilish orqali, aholi orasida varikoz kasalligining tarqalishini kamaytirishga qartilgan.*

Kalit so'zlar: *Venoz yetishmovchilik, Flebologiya, Fitoterapiya, Endovenoz lazer ablyatsiyasi, Minimal-invaziv usulla, Skleroterapiya, Flebektomiya, Mexanik-kimyoviy ablyatsiya, Minimal invaziv, Venotonik preparatlar, Radiochastotali ablyatsiya, Sklerozant modda, Fototermal energiya.*

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INTEGRATION OF PHYTOTHERAPY AND MODERN INVASIVE METHODS IN THE TREATMENT OF VARICOSE DISEASE

Abstract: *This article aims to reduce the prevalence of varicose veins among the population by conducting an in-depth analysis of the etiology and*

pathophysiology of varicose veins, comparing and analyzing the effectiveness of phytotherapy and modern endovenous treatment methods in the treatment of this disease.

Keywords: *Venous insufficiency, Phlebology, Phytotherapy, Endovenous laser ablation, Minimally invasive method, Sclerotherapy, Phlebectomy, Mechanical-chemical ablation, Minimally invasive, Venotonic drugs, Radiofrequency ablation, Sclerosing agent, Photothermal energy*

Kirish qismi. JSST ma’lumotlariga ko’ra varikoz kasalligi bugungi kunda keng tarqalgan kasalliklardan biri bo‘lib, u sivilizatsiya kasalliklari ro‘yxatiga kiritilgan. Venoz tizimning asosiy vazifalaridan biri qonning yurakka qaytishini ta’minlashdir. Agar venoz tizimni suyuqlik bilan to‘ldirilgan va tik turgan quvur sifatida tasavvur qilsak, uning quyi qismida suyuqlik ustuni bosim hosil qiladi. Venoz qon oqimi yurakka qaytish jarayonida tortishish kuchiga qarshi harakat qiladi. Organizm bu sharoitlarga turli moslashuv mexanizmlari orqali moslashgan. Passiv holatda (yotgan, o‘tirgan yoki tik turgan) venoz qon oqimini ta’minlashda sistolik bosim va nafas olish jarayoni muhim rol o‘ynaydi. Nafas olayotganda pastki vena kavak tizimidagi bosim ortib, qon oqimi sekinlashadi. Chuqur nafas olayotganda yoki nafasni ushlab turganda, u deyarli to‘xtaydi. Nafas chiqarish jarayonida esa qorin bo‘shlig‘idagi bosim pasayib, qon oqimini rag‘batlantiruvchi assimilyatsiya mexanizmi ishga tushadi. Varikoz kasalligining rivojlanishiga turmush tarzi va kasb bilan bog‘liq omillar ta’sir ko‘rsatadi. Masalan, uzoq vaqt harakatsiz qolish yoki doimiy o‘tirish talab qilinadigan kasblarda ishlash (masalan, transport haydovchilari) kasallik xavfini oshiradi. Dunyo miqyoshida rivojlangan mamlakatlar aholisi orasida varikoz kassaligining turli belgilari 70 foizgacha odamda uchraydi. Tadqiqotlar shuni ko‘rsatadiki, varikoz kassaligi ayollarning 35 foizi 25-45 yosh oralig’ida, erkaklarning esa 20 foizi 45-50 yosh oralig’ida ushbu kassalikdan aziyat chekadi. Bu esa venoz tizimning arterial tizimga nisbatan murakkab sharoitlarda ishlashini ko‘rsatadi.

Varikoz kasalliklarini rivojlantiruvchi asosiy omillar**.** Genetika - biriktiruvchi to'qimalarning yetishmasligi tufayli qon tomirlari devorlarining kongenital zaifligi [1]; qattiq kiyim - inguinal burmalardagi asosiy tomirlarni siqib chiqarish qon aylanishini buzadi; semizlik - tana massasi indeksining 27 kg/m^2 gacha oshishi kasallik xavfini 33% ga oshiradi; harakatsiz ish va harakatsiz turmush tarzi, og'ir yuklarni ko'tarish bilan bog'liq ishlarda - statik holat oyoq-qo'llardagi qonning turg'unligini qo'zg'atadi;, noto'g'ri ovqatlanish muhim ozuqa moddalarining yetishmasligi qon tomirlari devorlarining tuzilishini tiklashni sekinlashtiradi; gormonal muvozanat varikoz tomirlarining rivojlanishi menopauza sindromi va osteoporozni davolash uchun gormonal kontratseptsiyalarni qo'llash; xomiladorlik - kattalashgan bachadon tomonidan retroperitoneal venalarning siqilishi qon aylanishini buzadi [2]. Varikoz rivojlantiruvchi kasalliklarini ikkilamchi omillarga esa quyidagilarni misol qilishimiz mumkin: stress va asab kasalliklari, arterial-venoz anastomozlar, sportiv zo'riqishlar, noqulay kiyim va poyabzallarni kiyish. Yu.L.Shevchenko varikoz alomatlarini bevosita bosqichlarga bo'lib o'rganishni

taklif qilgan. 1 va 2 bosqichlarda: oyoq, boldir va sonlarda venoz naqshlarning paydo bo'lishi, oyoqlarda og'irlik, bosim, o'rtacha og'riqlarni his qilish, tortishishlar (ayniqsa kechasi), ishdan keyin, kunning oxirida oyoqlarning shishishi, tez charchash. 3 va 4 bosqichlarda: shishlar; qon tomirli yulduzlar (telangioektaziyalar), turli og'riqlar (pulsli, mushaklarda qichishish, yurish paytida og'riq, vena bo'ylab og'riq, umumiy og'riq va oyoqlarning qaqshab og'rishi), boldir va tovon yonlari terisi yuzasida uzun varikoz venalar paydo bo'lishi, teri o'zgarishlari uning qurishi va pigmentatsiyasi, qorayishi va jigarrang dog'lar bilan qoplanishi. Bundan tashqari, bu belgilarga keyinchalik bir qator kasalliklar, xususan dermatit, ekzema va trofik kasalliklar, yaralar qo'shilishi mumkin[3]. Bugungi kunda ushbu kasallikni davolash uchun bir qancha metodlar va dori prepearatlari ishlab chiilmoqda. Biz o’z kuzatuv tadqiqotimizda bu kasallikni davolashdagi tabobat uslubidagi tabiiy vositalarni va zamonaviy tibbiyotda qo’llanilayotlagan metodlarni o’zaro solishtirib o’rgandik. Quyida ular haqida atroflicha to’xtalib o’tamiz.

Fitoterapiya varikoz kasalligini yengillashtirishda yordam beruvchi tabiiy muolaja usullaridan biri hisoblanadi [4]. Hamda ushbu kassalikni simtomlarini yegilashtirishda quyidagi tabiiy mahsulotlarda foydalanish tavsiya etiladi. Andiz ildizi, mavrak va yalpizdan 100 g dan olib, aralashma tayyorlanadi. Uch osh qoshiq yig‘mani kechqurun termosga solib, ustiga uch stakan qaynoq suv quyiladi. Ertalab damlama suzilib, kun davomida to‘rt mahal ovqatdan yarim soat oldin 150 ml dan ichiladi. Anor gulining quritilgan shakli issiq suvda ivitilib, tomirlarning ko‘karib ketgan joylariga qo‘yiladi va ustidan bog‘lanadi. Bu usul ko‘karishlarni kamaytirishda samarali hisoblanadi. Bo‘yimodaron, ruta va gazanda o‘simliklaridan bir choy qoshiqdan aralashma tayyorlanadi. Ustiga bir stakan qaynoq suv quyib, yarim soat damlanadi. Kuniga ikki mahal, ertalab va kechqurun, ovqatdan 15 daqiqa oldin bir stakandan iste’mol qilinadi. Bundan tashqari, bo‘yimodaron va limono‘t 10 g dan, tog‘jumro‘t 15 g dan olinib, aralashtiriladi. Ustiga qaynoq suv quyib, bir soat damlanadi va kuniga ikki mahal iste’mol qilinadi. Qichitqio‘t bargidan ikki osh qoshiq olinib, ustiga yarim litr qaynoq suv quyiladi va bir soat davomida damlanadi. Ushbu damlama kuniga uch mahal yarim stakandan ichiladi. Parhezga rioya qilish (go‘sht, baliq, qovurilgan taomlardan tiyilish) venalarning varikoz kengayishini davolashda yaxshi natija beradi. Qichitqio‘t, bo‘yimodaron va ruta o‘simliklaridan bir choy qoshiqdan olib, aralashma tayyorlanadi. Ustiga bir stakan qaynoq suv quyib, yarim soat damlanadi va kuniga ikki mahal iste’mol qilinadi. Dalachoy damlamasi ichish hamda vannalar qabul qilish venalar tugunlariga ijobiy ta’sir qiladi. Soxtakashtan, tol va eman novdalaridan 500 g dan olinib, sirli idishda yarim soat qaynatiladi. So‘ngra, 200 g ittikanak, moychechak va dalachoy o‘simliklari qo‘shilib, bir kecha davomida damlanadi. Keyin uch buxanka javdar noni ham qaynatilib, har ikkala qaynatma vanna uchun ishlatiladi. Har kuni uyqu oldidan 30-40 daqiqa davomida qabul qilinadi. Suv harorati 38-40°C bo‘lishi lozim. Yerqalampir asosida dorivor bog‘lam tayyorlash uchun 100 g javdar uni, 50 g dog‘lanmagan yog‘ va ikki osh qoshiq qirg‘ichdan chiqarilgan yerqalampir aralashtiriladi. Ushbu aralashma og‘rigan joylarga surtiladi. Yashil, pishmagan zaytun yong‘oqlari to‘g‘rab idishga solinadi va ustidan zaytun yog‘i quyiladi.

Aralashma o‘n kun davomida quyosh nuri ostida saqlanadi. So‘ngra, tayyor damlama ertalab va kechqurun og‘rigan joylarga surtiladi. Olma sirkasi venalar varikozi uchun foydali hisoblanadi. Kuniga ikki mahal suvda eritilmagan olma sirkasi jarohatlangan joylarga surtiladi. Bundan tashqari, bir stakan suvga ikki choy qoshiq olma sirkasi solib, kun davomida 2-3 marta ichiladi. Shuningdek, ikki choy qoshiq sirka bir stakan qaynoq suv bilan aralashtirilib, og‘rigan joylarga surtiladi. Olmaning "Antonovka" navi damlamasi qonni tozalash, uyqu va ishtahani yaxshilash xususiyatiga ega. Uch dona olma sovuq suvda yuvilib, sirli idishga joylashtiriladi va ustidan bir litr qaynoq suv quyiladi. Idish yopilib, to‘rt soat davomida jun mato bilan o‘rab qo‘yiladi. Keyin olmalar ezilib, damlama suzib olinadi va asal bilan ichiladi. 50 ml olma damlamasiga bir osh qoshiq asal qo‘shilib, nahorgi paytda va uxlash oldidan ichiladi. Bu usul venalar varikozi va tromboflebitda qo‘llaniladi.Tirnoqgul va qoncho‘pdan 75 g dan, gazanda va mavrakdan 100 g dan olinib, aralashma tayyorlanadi. Uch osh qoshiq yig‘mani kechqurun termosga solib, ustiga uch stakan qaynoq suv quyiladi. Ertalab damlama suzilib, kun davomida to‘rt mahal ovqatdan yarim soat oldin 150 ml dan ichiladi. Eman novdalari qaynatmasi venalarning varikozini davolashda foydalidir. Eman, tol va kashtan novdalaridan bir osh qoshiqdan olib, bir litr suvda yarim soat davomida qaynatiladi. So‘ngra, bir osh qoshiqdan moychechak, dalachoy va ittikanak o‘simliklari qo‘shilib, 12 soat davomida damlanadi. Suzib olingandan keyin, unga ikki osh qoshiq asal qo‘shiladi. Dastlabki ikki kun davomida 50 ml, keyingi ikki kun 100 ml, qolgan kunlar 150 ml dan ichiladi. Davolanish kursi 20 kun davom etadi. 5-10 kun tanaffus qilingandan so‘ng, muolaja takrorlanadi.

Ikkinchi yondashuv zamonaviy tibbiy metodlar haqida quyida atroflicha to’xtalamiz. So‘nggi yillarda varikoz kasalliklarini davolashda minimal invaziv usullarning jadal rivojlanishi ushbu patologiyani konservativ va estetik jihatdan samarali tarzda bartaraf etish imkonini yaratdi. An’anaviy ochiq jarrohlik (krossektomiya va safenektomiya) usullarining o‘rnini hozirda endovenoz lazer ablyatsiyasi, radiochastotali ablyatsiya va mexanik-kimyoviy ablyatsiya bo‘lgan muqobil texnologiyalardan faydalanilmoqda [5].

Endovenoz lazer ablyatsiyasi – bu metod birinchi marta 1999-yilda klinik amaliyotga joriy etilgan bo‘lib, u safen venalarni yopish maqsadida yuqori intensivlikdagi lazer energiyasidan foydalanishga asoslangan. Protsedura paytida tomir ichiga ingichka lazer tolasi joylashtiriladi, u orqali fototermal energiya yuboriladi. Bu energiya tomir endoteliyasining destruksiyasini keltirib chiqarib, tomir devorining kollabiratsiyasiga va keyinchalik fibrozlanishiga olib keladi[6]. Lazer nurlanishining samaradorligi uning to‘lqin uzunligiga bog‘liq bo’lib. Dastlabki bosqichlarda 810–980 nm to‘lqin uzunliklari qo‘llanilgan bo‘lsa, hozirda 1470 nm va 1940 nm to‘lqin uzunlikdagi lazerlar yuqori biologik to‘qima selektivligi, kamroq termik shikastlanish va pastroq og‘riq sindromi bilan ajralib turadi. Ayniqsa, radial chiqishli (360° nur tarqatuvchi) lazer tolalarining joriy etilishi bilan termik energiya tomir devoriga bir xil taqsimlanadi[7]. Bu esa ko‘proq kontrolli koagulyatsiyani ta’minlaydi.

Radiochastotali ablyatsiya - bu issiqlik asosidagi yana bir minimal invaziv metod bo‘lib, unda radiochastotali to‘lqinlar yordamida tomir ichki devori isiydi va destruksiyaga uchraydi. Bugungi kunda eng keng qo‘llaniladigan tizim — bu Medtronic ClosureFAST™ kateteridir. Ushbu tizim orqali har bir segment 120°C haroratda 20 soniya davomida ishlanadi[8]. Radiochastotali ablyatsiya usuli endovenoz lazer ablyatsiyasi bilan taqqoslanganda, bemorlarda protsedura davomida og‘riqning kamligi, tez tiklanish, kamroq pigmentatsiya va paresteziya bilan ajralib turadi. Radiochastotali ablyatsiya yordamida safen venalarning muvaffaqiyatli yopilishi 5 yil ichida 88–93% holatlarda kuzatiladi. Bundan tashqari, bu usul bilan ambulator sharoitda davolash mumkin bo‘lib, bemor operatsiyadan keyin tezda kundalik faoliyatga qayta oladi.

Mexanik-Kimyoviy Ablyatsiya — bu issiqlikdan xoli bo‘lgan, nisbatan yangi endovenoz davolash usuli bo‘lib, u 2010-yilda ishlab chiqilgan va ClariVein® tizimi orqali amalga oshiriladi. Usul ikki komponentning sinergetik ta’siriga asoslangan: mexanik jarohat va kimyoviy sklerozant ta’siri. Kateterning rotatsion harakati tomir devoriga mexanik zarba beradi, bu paytda tomir ichiga polidokanol kabi sklerozant modda yuboriladi[9]. Tomir endoteliysi mexanik va kimyoviy zararlanish natijasida obliteratsiyaga uchraydi. Mexanik-kimyoviy ablyatsiyaning eng katta afzalliklaridan biri — asab tolalari yaqin joylashgan kichik diametrli tomirlarda qo‘llanilishi mumkinligi, chunki bu usulda termik shikastlanish yo‘q. Klinik sinovlarda mexanik-kimyoviy ablyatsiya usuli bilan 1 yillik tomir yopilish ko‘rsatkichi 90% ga yetgani qayd etilgan. Protsedura lokal anesteziyasiz ham bajarilishi mumkin[10]. Biz o’z kuzatishlarimizda bu qo’llanilayotgan uslublar va halq tabobati dori vositalarini o’zaro taqqasladik. Fitoterapeftik davolash tabiiy o‘simliklar asosida amalga oshiriladi va ko‘plab bemorlar tomonidan yaxshi qabul qilinadi. Ushbu yondashuv venalarning holatini yengillashtirishda samarali bo‘lishi mumkin, ammo u ko‘proq simptomlarni yengillashtirishga qaratilgan bo‘lib, kasallikning sababini to‘liq bartaraf etishda aniq natijalarga erishish qiyin. Bundan tashqari, fitoterapiya oddiy va xavfsiz usul hisoblanadi, ammo uning samaradorligi va tezkorligi zamonaviy davolash usullari bilan taqqoslaganda pastroq bo‘lishi mumkin. Zamonaviy endovenoz davolash usullari (lazer ablyatsiyasi, radiochastotali ablyatsiya va mexanik-kimyoviy ablyatsiya) minimal invaziv metodlar bo‘lib, yuqori samaradorlikka ega. Ushbu usullar venalarning tuzilishini tuzatib, kasallikni to‘liq bartaraf etish imkonini yaratadi. Biroq, bu usullar yanada murakkab va qimmat bo‘lishi, ba'zida og‘riq va yana boshqa nojo‘ya ta’sirlarga olib kelishi mumkin. Shuningdek, tiklanish davri ham biroz ko‘proq vaqt talab etishi mumkin.

Varikoz kasalligi – bu venoz tizimning surunkali yetishmovchiligi bilan bog‘liq patologik holat bo‘lib, unda venalarning kengayishi va qon aylanishining buzilishi kuzatiladi. Kasallik rivojlanishining asosiy omillari orasida irsiy moyillik, uzoq vaqt davomida tik yoki o‘tirib ishlash, gormonal o‘zgarishlar, noto‘g‘ri ovqatlanish va kamharakat turmush tarzi muhim o‘rin tutadi. Shunday qilib, fitoterapeftik davolash tabiiy va xavfsiz bo‘lsa-da, samaradorligi cheklangan va uzoq muddatli ta'sir ko‘rsatmasligi mumkin. Zamonaviy endovenoz davolash

usullari esa yuqori samaradorlik, tez tiklanish va kamroq yon ta’sirlar bilan ajralib turadi, ammo ular ko‘proq resurs va malaka talab qiladi.

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PSYCHOLOGICAL AND PEDAGOGICAL CONDITIONS FOR THE FORMATION OF LEADERSHIP QUALITIES IN UNIVERSITY STUDENTS

***Abstract**: The article addresses the issue of developing leadership qualities in university students, outlining the individual components of psychological and pedagogical activities. It provides scientific recommendations for creating psychological and pedagogical conditions for forming leadership qualities in students.*

***Keywords:** Leadership qualities, management, specialization, leadership, mastery, problematic situation, managerial competence, adaptability, professional development.*

The topic of leadership plays a crucial role today and has a distinct historical significance. Socio-economic relations are influenced by external sources. In its general sense, leadership is a person's ability to influence others and guide them toward achieving specific goals. The relevance of this topic lies in the fact that many Russian and foreign scholars have studied and continue to study leadership qualities. However, an analysis of pedagogical, sociological, philosophical, and psychological literature shows that there is no consensus on this phenomenon and its components.

Specialist I. Mahmudov, in his book "Management Psychology," presents the following thoughts on the term "leader": "... In general, the term 'leader' is often replaced with 'guide' in the literature. We believe that the term 'guide' does not fully convey the psychological characteristics of a 'leader.' The word 'guide' is used concerning a group, referring to a person who influences its members and leads them toward a goal. Leadership is a state that can be identified by analyzing the group structure and its relationship system. However, there are several aspects of leadership that cannot be analyzed solely within the framework of relationships. One of the key aspects of leadership is the ability to act in accordance with a given situation. Initiative, ingenuity, and skill in overcoming difficulties in a problematic situation are qualities inherent in a leader.

In difficult situations requiring problem-solving, a leader stands out due to their advanced thinking and initiative. In our opinion, the Uzbek terms "peshqadam" (pioneer) and "yetakchi" (leader) together can fully express the essence of leadership.

One of the key characteristics influencing an effective leader is their locus of control. People with an internal locus of control tend to be more energetic, capable of managing their actions easily, socially active, strong-willed, and open to new ideas. On the other hand, individuals with an external locus of control prefer structured and well-defined tasks, are less initiative-driven, and show lower

creativity and independence. The comfort zone for an external locus of control is to work under someone else's leadership.

The issue of forming leadership qualities in university students falls under the category of psychological and pedagogical research and is more theoretical than practical. The process of developing leadership qualities among students should be viewed as a specially designed psychological and pedagogical activity aimed at equipping them with leadership, influence, and management knowledge and skills.

This activity involves targeted preparation, enabling students to acquire the necessary leadership technology knowledge applicable in various social activities to solve different problems effectively.

To successfully implement psychological and pedagogical activities aimed at developing leadership qualities in students, it is essential to define the necessary psychological and pedagogical conditions, including all relevant circumstances and influencing factors. This also involves organizing pedagogical activities in a goal-oriented manner, employing appropriate pedagogical tools, techniques, and training sessions to m develop leadership qualities effectively.

Psychological and Pedagogical Conditions for Developing Leadership Qualities in University Students:

1. Utilization of Educational EnvironmentResources: Maximizing all educational resources within the institution and updating those that have the most influence on the leadership development process.

2. Training and Exercises for Dynamic Personal Development: Leadership qualities should be developed based on ideas of dynamic personal structure, where leadership functions as a substructure of an individual’s orientation.

3. Development of Self-Awareness: Particular attention should be paid to developing students' self-awareness and their understanding of their locus of control in leadership development.

4. Consideration of Leadership Qualities from the Perspective of Five Personality Factors: Leadership qualities formed during the educational process should be analyzed in terms of five fundamental personality factors. Students should be encouraged to develop the personal traits necessary for leadership based on these factors.

5. Problem-Solving in Simulated Situations: The leadership development process should be continuous and based on resolving problems in teacher-modeled situations where students demonstrate leadership actions.Leadership action involves personal influence in solving tasks, assuming leadership roles, and regulating interpersonal relationships within a group based on personal initiative.

The process of shaping an individual is complex and multifaceted. On one hand, an individual assimilates pre-existing social relationships and forms of interaction in direct social interactions. On the other hand, they seek self-expression through their unique development path.

The development of leadership qualities and the formation of individuals as leaders should be based on knowledge of dynamic personality structures through training, exercises, education, and upbringing. As society, technology,

communications, and social relations evolve, leadership concepts and leadership development methods also change.

Improving the quality of professional development can be achieved by focusing on key factors, including the primary component of future specialists' competence—management competence. Defining its essence is crucial.

The theoretical and methodological foundations for developing a model of managerial competence in students have been identified. The competency-based approach should be utilized in designing educational objectives, content, and technology to prepare future specialists for lifelong learning.

A contextual learning model should be applied to develop managerial competence, integrating the latest achievements in management theory and interdisciplinary modular complexes into the educational process. Self-assessment methods should be employed to encourage students' self-management, self-development, and active engagement in their learning process.

A systematic diagnostic approach should be implemented for developing managerial competencies based on reflective technologies and Bloom's Taxonomy, which classifies educational objectives into six levels:

- ❖ Knowledge
- ❖ Comprehension
- ❖ Application
- ❖ Analysis
- ❖ Synthesis
- ❖ Evaluation

By improving the quality of professional development, fostering managerial competencies, and enhancing professional preparedness, leadership skills and qualities can be developed not only for professional success but also for lifelong achievement. Preparing students for leadership roles and developing their leadership potential will, in turn, bring significant benefits to society.

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AHOLINI UZOQ VAQT FOYDALANADIGAN BUYUMLAR BILAN TA'MINLANGANLIK DARAJASINING DINAMIK TAHLILI

Annotatsiya: *Aholini uzoq vaqt foydalanadigan buyumlar bilan ta'minlanganlik darajasining dinamik tahlili mavzusi iqtisodiy va ijtimoiy sohalarda muhim ahamiyatga ega bo‘lib, bu masala aholining turmush darajasi, iqtisodiy barqarorlik va yashash sifatini oshirishda asosiy omillardan biri hisoblanadi. Uzoq muddat foydalaniladigan buyumlar — bu kundalik hayotda muntazam ravishda ishlatiladigan, uzoq vaqt davomida xizmat qiladigan va almashtirishga kam ehtiyoj tug‘diradigan mahsulotlar hisoblanadi. Bunday buyumlar orasida mebel, maishiy texnika, transport vositalari, qurilish materiallari va boshqa ko‘plab mahsulotlar mavjud. Aholining ushbu buyumlar bilan ta'minlanish darajasi esa ularning iqtisodiy imkoniyatlari, bozor infratuzilmasi, ishlab chiqarish va import hajmlari, shuningdek, iste'mol madaniyati bilan chambarchas bog‘liqdir.*

Kalit so‘zlar: *aholi, bozor infratuzilmasi, ishlab chiqarish, buyumlar, mahsulotlar, iqtisodiyot, xizmat, vaqt.*

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DYNAMIC ANALYSIS OF THE LEVEL OF PROVISION OF THE POPULATION WITH DURABLE GOODS

Abstract: *The topic of dynamic analysis of the level of provision of the population with durable goods is of great importance in the economic and social spheres, and this issue is one of the main factors in improving the standard of living, economic stability and quality of life of the population. Durable goods are products that are regularly used in everyday life, serve for a long time and rarely need replacement. Such goods include furniture, household appliances, vehicles, building materials and many other products. The level of provision of the population with*

these goods is closely related to their economic capabilities, market infrastructure, production and import volumes, as well as consumer culture.

Keywords: *population, market infrastructure, production, goods, products, economy, service, time.*

Kirish

Aholini uzoq vaqt foydalanadigan buyumlar bilan ta'minlanganlik darajasining dinamik tahlili zamonaviy iqtisodiyot va ijtimoiy hayotning muhim yo‘nalishlaridan biridir. Uzoq muddat foydalaniladigan buyumlar, ya'ni mebel, maishiy texnika, transport vositalari va boshqa shunga o‘xshash mahsulotlar, aholining kundalik hayotidagi qulaylik va farovonlik darajasini belgilovchi asosiy omillardandir. Ushbu buyumlar nafaqat iste'mol ehtiyojlarini qondirishda, balki iqtisodiy barqarorlik va yashash sifatini oshirishda ham muhim rol o‘ynaydi. Shu sababli, ularning aholi orasida taqsimlanishi va foydalanish darajasining o‘zgarishlari doimiy ravishda o‘rganilishi zarur. Dinamik tahlil esa, vaqt davomida ushbu ta'minlanganlik darajasining o‘zgarishini, unga ta'sir etuvchi omillarni va natijalarini chuqurroq anglash imkonini beradi. Bu tahlil orqali iqtisodiy siyosatni shakllantirish, ishlab chiqarish va taqsimot tizimlarini takomillashtirish, shuningdek, aholining turmush darajasini yaxshilashga qaratilgan strategiyalarni ishlab chiqish mumkin bo‘ladi.

Adabiyotlar tahlili va tadqiqot metodologiyasi

Uzoq muddat foydalaniladigan buyumlar bilan ta'minlanganlik darajasining o‘zgarishi vaqt o‘tishi bilan ijtimoiy-iqtisodiy sharoitlarning o‘zgarishi, texnologik rivojlanish, aholi soni va uning tuzilmasidagi o‘zgarishlar, shuningdek, davlat siyosati va tashqi iqtisodiy aloqalarning ta'siri ostida yuzaga keladi. Bu jarayonni tahlil qilishda avvalo buyumlarning taqsimlanishi va ulardan foydalanish darajasi o‘rganiladi. Masalan, maishiy texnika va mebel kabi mahsulotlarning har bir oilada mavjudligi va ularning sifat ko‘rsatkichlari, shuningdek, ularning eskirish sur'ati va almashtirish ehtiyoji aholi ta'minoti darajasini belgilovchi asosiy omillardir. Iqtisodiy o‘sish va aholi daromadlarining oshishi uzoq muddat foydalaniladigan buyumlarga bo‘lgan talabni oshiradi. Shu bilan birga, texnologik yangiliklar va innovatsiyalar yangi turdagi mahsulotlar paydo bo‘lishiga olib keladi, bu esa iste'molchilarning tanlov imkoniyatlarini kengaytiradi. Natijada, aholi uzoq muddat foydalaniladigan buyumlarni xarid qilishda yanada ehtiyotkorlik bilan yondashadi, sifat va xizmat ko‘rsatish darajasiga alohida e'tibor beradi. Shu bois, ishlab chiqaruvchilar va sotuvchilar ham mahsulot sifatini yaxshilashga, xizmat ko‘rsatish tizimini rivojlantirishga intiladi..aholining uzoq muddat foydalaniladigan buyumlar bilan ta'minlanganlik darajasining dinamikasi shuningdek, iqtisodiy inqirozlar, valyuta kurslarining o‘zgarishi, import va eksportga qo‘yilgan cheklovlar kabi tashqi omillarga ham sezilarli ta'sir ko‘rsatadi. Masalan, iqtisodiy qiyinchiliklar davrida aholi daromadlari kamayishi sababli, bunday buyumlarga bo‘lgan talab pasayishi mumkin. Bu holatda, iste'molchilar ko‘proq zaruratga asoslangan xaridlarni amalga oshiradi, ortiqcha xarajatlardan qochadi va mavjud mahsulotlarni uzoqroq ishlatishga harakat qiladi. Shu tariqa, uzoq muddat foydalaniladigan

buyumlar bilan ta'minlanganlik darajasi vaqtincha pasayishi mumkin. Demografik omillar ham aholi ta'minotiga ta'sir ko‘rsatadi. Yoshlar sonining ko‘payishi, oilalarning shakllanishi va ularning o‘lchami uzoq muddat foydalaniladigan buyumlarga bo‘lgan ehtiyojni o‘zgartiradi. Masalan, yosh oilalar ko‘pincha yangi mebel va maishiy texnika sotib olishga ehtiyoj sezadi, chunki ular o‘z uylarini jihozlash jarayonida bo‘ladi. Shu bilan birga, katta yoshdagi aholining ko‘payishi esa eskirgan buyumlarni almashtirish va ta'mirlashga bo‘lgan talabni oshiradi. Bu esa bozorning turli segmentlarida mahsulotlarga bo‘lgan talabni diversifikatsiyalash imkonini beradi.

Muhokama va natijalar

Texnologik taraqqiyot uzoq muddat foydalaniladigan buyumlar sohasida yangi imkoniyatlar yaratadi. Masalan, energiya samaradorligi yuqori bo‘lgan maishiy texnika, ekologik toza va bardoshli materiallardan tayyorlangan mebel, aqlli texnologiyalar bilan jihozlangan transport vositalari kabi mahsulotlar iste'molchilar orasida tobora ommalashib bormoqda. Bu esa, o‘z navbatida, uzoq muddat foydalaniladigan buyumlar ishlab chiqarish sohasida innovatsiyalarni rag‘batlantiradi va bozorda raqobatni kuchaytiradi.[1]

Shuningdek, davlat siyosati va ijtimoiy dasturlar ham aholini uzoq muddat foydalaniladigan buyumlar bilan ta'minlanganlik darajasiga sezilarli ta'sir ko‘rsatadi. Davlat tomonidan beriladigan subsidiyalar, kreditlar, imtiyozli to‘lov shartlari va boshqa qo‘llab-quvvatlash mexanizmlari aholining xarid qilish qobiliyatini oshiradi. Bunday siyosatlar, ayniqsa, kam ta'minlangan va o‘rta daromadli oilalar uchun juda muhimdir, chunki ular uzoq muddat foydalaniladigan buyumlarni sotib olish imkoniyatlarini kengaytiradi va yashash sharoitlarini yaxshilashga yordam beradi. Uzoq muddat foydalaniladigan buyumlar bilan ta'minlanganlik darajasining dinamik tahlilida aholi ehtiyojlari va ularning o‘zgarishini ham hisobga olish zarur. Iste'molchilarning didi, madaniyati va turmush tarzi vaqt o‘tishi bilan o‘zgaradi, bu esa mahsulotlarga bo‘lgan talabni ham shakllantiradi. Masalan, zamonaviy yashash sharoitlari va shaharsozlik rivojlanishi yangi turdagi mebel va maishiy texnikani talab qiladi. Shu bilan birga, ekologik xavfsizlik va barqarorlikka bo‘lgan e'tibor ortishi mahsulotlarning ekologik tozaligi va energiya tejamkorligini ta'minlash zaruratini yuzaga keltiradi.[2]

Ijtimoiy-iqtisodiy o‘zgarishlar, xususan, urbanizatsiya jarayoni ham uzoq muddat foydalaniladigan buyumlar bilan ta'minlanganlik darajasiga ta'sir qiladi. Shaharlar sonining ko‘payishi va ularning kengayishi yangi turdagi uy-joylar va infratuzilma talabini oshiradi, bu esa mebel, qurilish materiallari va maishiy texnika bozorining rivojlanishiga olib keladi. Shuningdek, qishloq joylarda yashovchi aholi uchun ham uzoq muddat foydalaniladigan buyumlarga bo‘lgan talab o‘ziga xos xususiyatlarga ega bo‘lib, bu hududlarda mahsulotlarni yetkazib berish va xizmat ko‘rsatish tizimini rivojlantirish zaruriyatini keltirib chiqaradi.[3]

Bozor infratuzilmasining rivojlanishi uzoq muddat foydalaniladigan buyumlar bilan ta'minlanganlik darajasini oshirishda muhim rol o‘ynaydi. Samarali taqsimot tarmoqlari, sifatli xizmat ko‘rsatish markazlari, kafolat va ta'mirlash xizmatlari iste'molchilar ishonchini oshiradi va mahsulotlarga bo‘lgan talabni

rag‘batlantiradi. Shu bilan birga, raqamli savdo platformalarining rivojlanishi iste'molchilarga mahsulotlarni qulay va tez xarid qilish imkoniyatini yaratadi, bu esa bozorda raqobatni kuchaytiradi va narxlarning barqarorlashtirilishiga yordam beradi.[4]

2024-yilgi ma'lumotlarga ko‘ra, o‘zbekiston aholisining uzoq muddat foydalaniladigan buyumlar bilan ta’minlanganlik darajasining dinamik tahlili ijobiy o‘zgarishlarni ko‘rsatmoqda. Umumiy ta’minlanganlik darajasi so‘nggi yillarda barqaror o‘sish sur’atiga ega bo‘lib, 2024-yilda bu ko‘rsatkich 2-3% ga oshgan. Bu o‘sish asosan kvartira va uy jihozlari, mebel hamda maishiy texnika kabi asosiy tovarlar bo‘yicha kuzatilmoqda. Masalan, birgina andijon viloyati misolida oladigan bo‘lsak, viloyatdagi har 100 ta uy xo‘jaligiga 58 ta avtomobil, 56 ta konditsioner, 74 ta elektr pechi va 176 ta televizor to‘g‘ri kelishi yuqoridagi fikrlarga yaqqol misol bo‘la oladi. Asosiy toifalar bo‘yicha ta’minlanish tahlilida, mebel buyumlari 2023 yilga nisbatan 3% ga oshganligi, aholi daromadlarining oshishi va qurilish sohasining rivojlanishi bilan izohlanadi. Maishiy texnika toifasida, sovutgich, kir yuvish mashinalari va televizor kabi mahsulotlar ta’minoti 4% ga yaxshilangan. Hududiy farqlarni ko‘rsatadigan statistik ma’lumotlarga ko‘ra, shahar hududlarida uzoq muddat foydalaniladigan buyumlarga ta’minot darajasi o‘rtacha 85-90% ni tashkil etsa, qishloq joylarda bu ko‘rsatkich 70-75% atrofida. Biroq, 2024-yilda qishloq hududlarda ham ta’minot yaxshilanganligi kuzatilmoqda, bu esa qishloq joylarda ishlab chiqarish va ta’minot tizimining rivojlanishidan dalolat beradi. 2022-2024 yillar orasidagi statistik ko‘rsatkichlar uzoq muddat foydalaniladigan buyumlar bilan ta’minlanish o‘rtacha yillik 2,5-3% o‘sish sur’atiga ega ekanligini ko‘rsatadi. Iste’mol narxlari indeksi va aholi daromadlarining oshishi bilan bog‘liq holda, bu ko‘rsatkichlarning kelajakda yanada yaxshilanishi kutilmoqda.

Xulosa

Xulosa qilib aytganda, aholining uzoq muddat foydalaniladigan buyumlar bilan ta'minlanganlik darajasining dinamik tahlili murakkab va ko‘p qirrali jarayon bo‘lib, u iqtisodiy, ijtimoiy, demografik, texnologik va siyosiy omillar ta'sirida shakllanadi. Ushbu jarayonni chuqur o‘rganish va tahlil qilish orqali aholi turmush darajasini oshirish, mahsulotlar sifatini yaxshilash va bozorda barqarorlikni ta'minlash mumkin. Shu bilan birga, davlat va xususiy sektor o‘rtasidagi hamkorlikni kuchaytirish, innovatsiyalarni rag‘batlantirish hamda iste'molchilarning ehtiyojlarini hisobga olgan holda siyosatlarni ishlab chiqish ahamiyatlidir. Bu esa uzoq muddat foydalaniladigan buyumlar sohasida barqaror rivojlanishga xizmat qiladi va aholining farovonligini ta'minlaydi.

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ARID MINTAQA TABIIY KOMPONENTLARI VA TABIIY MAJMUALARINING PROGNOZLI-AXBOROT XOSSALARI

Annotatsiya: *Maqolada O'zbekiston arid mintaqa landshaftlarining tabiiy komponentlari va tabiiy majmualarining prognozli-axborot xossalari ochiqlangan. Landshaftlar o'zgarishining umumiy yo'nalishi va xarakterini, tabiiy, tabiiy-antropogen jarayon va hodisalarining tezligi yoki jadalligi ochib berilgan.*

Kalit so'zlar: *agroiqlim, relyef, harorat, atmosfera bosimi, havoning namligi, bug'lanish, yog`in, zonallik, arid, gumid, ekstragumid.*

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PREDICTIVE AND INFORMATIONAL PROPERTIES OF NATURAL COMPONENTS AND NATURAL COMPLEXES OF ARID REGIONS

Abstract: *The article describes the predictive and informational properties of the natural components and natural complexes of the landscapes of the arid region of Uzbekistan. The general direction and nature of landscape changes, the speed or intensity of natural, natural-anthropogenic processes and phenomena are revealed.*

Keywords: *agroclimate, relief, temperature, atmospheric pressure, air humidity, evaporation, precipitation, zonality, arid, humid, extrahumid.*

Kirish. Insonning xo'jalik faoliyatlari ta'sirida landshaftlarda yuz beradigan o'zgarishlarni prognozlashda boshqa omillar bilan bir qatorda tabiat komponentlari va landshaftlarning o'zini prognozli xossalarini hisobga olish muhim ahamiyatga egadir. Bu masalaga Yu.G.Simonov va b. (1982) va b., T.V.Zvonkova (1987), V.S.Preobrajenskiy va boshqa (1988) olimlar qayta-qayta e'tibor qaratganlar. Ularning g'oyalariga asoslanib tabiiy muhit o'zgarishlarini prognozlashtirishda landshaftlarning prognozli xossalaridan foydalangan holda O'zbekistonning arid hududlari landshaftlarining tuzilmaviy tarkibi hisoblanmish tabiat komponentlarining prognozli-axborot xossalarining tizimli tahlili landshaftlarning umumiy xossalarini aniqlashni osonlashtirishi tabiiy hol.

Geologik tuzilish (geotuzilma – geostruktura, neotektonika, yer po'stining hozirgi harakati, yotqiziqlarning litologik tarkibi) – landshaftlar o'zgarishining umumiy yo'nalishi va xarakterini, tabiiy, tabiiy-antropogen jarayon va

hodisalarining tezligi yoki jadalligini belgilaydi. O‘zbekiston hududining geologik tuzilishida aniq qonuniyat kuzatiladi: faol muz, gravitatsiya (yonbag‘ir), karst, eroziya jarayonlari va tuzlarning chiqarilishiga moyil tabiiy drenajlangan respublikaning tog‘-tog‘oldi qismlarini egallovchi **orogen mintaqa**; tekislik – o‘zgargan cho‘llarni egallagan **platforma** uchun – aeratsiya mintaqasida tuz to‘planishi va keng miqyosda eol jarayonlar hukmronlik qiladigan, grunt suvlari yuza va jinslardan yuqoriga oqib chiqadigan yetarli darajada drenajlanmaganlik xosdir.

Har qanday hududning geologik tuzilishida jinslarning tarkibi va xarakteri muhim ahamiyatga egadir. G‘arbiy Tyanshan, Hisor, Turkiston tog‘larida va Zarafshon tizmasida turli darajadagi kuch va qattiqlikdagi metomorfik, intruziv, effuziv, cho‘kindi jinslar keng tarqalgan bo‘lib, ular asosan qoyali va yarim qoyali, ba’zan plastikli yarim qoyalidir. Shu bilan bog‘liq tarzda tog‘li hududlarda qoyali va yarim qoyali jinslarda mexanik (fizik) nurashning maxsulotlari sifatida yoyilma (sochilma) – ag‘darilma jarayonlar rivojlangan, shu vaqtning o‘zida eroziya jarayonlarining kechishi nisbatan sekinroq ro‘y beradi. Tog‘larning yonbag‘irlarida, ayniqsa past va o‘rtacha baland tog‘larda o‘simlik qoplami va suv resurslaridan nooqilona foydalanish natijasida eroziya – surilma jarayonlaridan ta’sirlangan lyosslar, lyossimon loyqalar keng tarqalgan.

Mirzacho‘l, Farg‘ona, Chirchiq-Ohangaron, Qashqadaryo, Surxondaryo, Zarafshon vodiylarining tog‘oldi prolyuvial tekisliklari dag‘al – yirik tarkibli yotqiqziqlardan iborat bo‘lib, turli qalinlikdagi lyossimon loyqa va lyosslar bilan qoplanganki, ular eroziya jarayonlari hamda cho‘kish hodisalariga moyil. Umuman to‘rtlamchi davr yotqiziqlarining litologik tarkibi tog‘lardan to deltalarning eng chekka qismlarigacha grunt suvlarining harakat tezligi va tuproqdagi tuzlar miqdorini mos ravishda o‘zgartiradi. Bu drenajning aniq turlarini qurish zaruratini bildiradi.

Arid mintaqada litologik tarkibning xarakteri tabiiy jarayonlarning u yoki bu turlarining rivojlanishini belgilaydi. Orol dengizining qurigan tubidagi qumli zamin bilan relyefning eol shakllari bog‘liq bo‘lsa, qumoq-loyli yotqiziqlarda asosan tuz to‘planishi ustuvordir.

Relyef (genetik turi, shakli, relyefning tadrijiy o‘zgarishi – dinamikasi va o‘yilganligi, relyef hosil qiluvchi jarayonlar) – prognozlashtirish jihatdan geologik tuzilish bilan birga iqtisodiyotning qaysidir tarmoqlarida landshaft resurslaridan foydalanishning imkoniyatlari hamda landshaftlarning barqarorlik toifalarini, geotizimlarning chegaralarini, tabiiy jarayon va hodisalarning tadrijiy o‘zgarishi (dinamikasi), tabiiy majmualar tuzilmasining xarakterini belgilaydi. Relyef shakli boshqa tabiiy sharoit (drenajlanganlik, gruntlar tarkibi)lar qatorida sug‘orishning rivojlanishi mobaynida grunt suvlarining tartibi va tuproq jarayonlari (tuz tartibi)da farqlarni keltirib chiqaradi; xususan to‘lqinsimon relyef shakli suv eroziyasi va deflyatsiya; ichki tomonga bukilgan shakl moddalarning galogeokimyoviy oqimi; tekis, nishab yoki kam nishabli shakl – eol; akkumulyativ shakl – tranzit va galogeokimyoviy oqim migratsiyasi hududi (oblasti) hisoblansa, sug‘oriladigan yerlardagi ko‘tarilgan maydonlar tuz yig‘uvchi (to‘plovchi)lar hisoblanadi.

Relyef hosil bo‘lish dinamikasi geotizimlarning o‘zgarishini prognozlashda e’tiborga olinishi zarur bo‘lgan asosiy omillardan biridir. Relyefning har bir shakli relyef hosil qiluvchi jarayonlarning u yoki bu turi yoki guruhiga moyil, natijada relyefning ushbu xususiyatini ishonchli aniqlash boshqa jarayon yoki hodisalarning rivojlanishini prognozlash uchun juda zarur.

Tik yonbag‘irli do‘ng yoki barxanlararo botiqlardagi qumli cho‘llarda deflyatsiya rivojlanishining faol bosqichi bo‘ladi, shu vaqtning o‘zida tiklikning yo‘qolishi deflyatsiyaning susayganini bildiradi.

Relyefning o‘yilganligi ko‘pincha sho‘rlanish – tuzning tuproqda tarqalish yo‘nalishini belgilaydi. Nishablikning kattaligi (0,01 gacha) odatda tuzlarning olib ketish mintaqasini yaratadi, o‘rtacha nishablik (0,001 gacha) tuzlarning tranzit mintaqasini shakllantiradi. Nishablikning kamligi (kam nishab – 0,0001 va undan kichik) quruqlikning pastqam maydonlari (daryolarning quyi terrasalari, deltalar, konus yoyilmalarning chekka qismlari va b.) uchun xarakterli bo‘lib, nam va tuz almashinuvining tik (vertikal) shaklini yuzaga keltiradi va grunt, tuproq va grunt suvlarida tuzlarning akkumulyatsiyasiga sabab bo‘ladi. Mahalliy nishabliklar mazkur mintaqada sho‘rlanish bo‘yicha bir xilda emaslikni keltirib chiqaradi.

Relyefning morfometrik ko‘rsatkichlaridan biri yerlarning qishloq xo‘jalik ishlab chiqarish xususiyati va meliorativ tadbirlar (gidrotexnik inshootlar va b. qurish)ni bir xil emasligini belgilovchi hududning o‘yilganlik chuqurligi hisoblanadi. Biroq, relyefning ushbu xususiyati sug‘orish natijasida botqoqlashish, sho‘rlanish va tuproq eroziyasi xavfini o‘z vaqtida aniqlash uchun juda zarurdir.

Iqlim sharoiti (havo va tuproq harorati, shamol, atmosfera yog‘inlari va b.) – eol, galogeokimyoviy, eroziya jarayonlarining aniq darajasi, jadalligi va miqyosini belgilaydi. Grunt suvlarining sathi yer yuzasiga yaqin, arid iqlim hukumron bo‘lgan O‘zbekistonning tekislik qismida prognostik jihatdan aeratsiya mintaqasida tuz to‘planish (galofit tabiiy majmualarning shakllanishi va rivojlanishi), deflyatsiya – akkumulyativ jarayonlarning kuchayishi (eol tabiiy majmualarning paydo bo‘lishi va rivojlanishi), eroziya va sel jarayonlarining jadallashishi (eroziya – surilma va sel landshaftlarining rivojlanishiga mos)ni kutish mumkin.

Shamol – yer yuzasining o‘yilishida, ayniqsa qumoq tuproq – qumli zaminli tekislangan maydonlarda, qumli cho‘llar orasida joylashgan sug‘oriladigan yerlar va madaniy yaylovlarni suv bilan ta’minlovchi sug‘orish kanallari hamda meliorativ tizimlarning loyqalanishida yetakchi omildir. Shamol transpiratsiya va tabiiy bug‘lanishni tezlashtirib, tuproqning yuqori qatlamlarini quritadi hamda ekinlarni sug‘orish navbati tezligini ko‘paytiradi.

Gidrogeologik sharoit – yerlarning tuproq-meliorativ holati va geotizimlarning yaylov-meliorativ xususiyatlarining yo‘nalishini belgilaydi. Bunga grunt suvlarining chuqurligi, ularning minerallashuvi, kimyoviy tarkibi va harakat tezligi kiradi. O‘zbekiston arid mintaqasining salmoqli hududlarida tabiiy drenajlanganlikning yetarli emasligi ustunlik qiladi, shu bois sug‘orish tufayli grunt suvlarining sathi yer yuzasiga yaqin joylashadi, keyin ular geotizimlarga gidromorflikni hadya etuvchi tuproq hosil bo‘lish jarayonida qatnashadi.

Grunt suvlarining chuqurligi sug‘orishning meliorativ tartibini belgilaydi: delta, terrasa va do‘ngli – tepali tekisliklarning grunt suvlari barqaror chuqurroq joylashgan, jadal drenajlangan maydonlarida grunt suvlari tuproqning suv-tuz tartibiga ta’sir ko‘rsatmaydi, natijada avtomorf turdagi tuproqlar rivojlanadi, grunt suvlarining kuchli yotiq (gorizontal) oqimi tufayli odatda yerlar sho‘rlanmaydi. Delta, konus yoyilma, terrasalar va boshqalarning qaysiki tik (vertikal) suv almashinuvi hukmron bo‘lgan kam va drenajlanmagan qismlari (ko‘proq chekkasi)da grunt suvlari tub qatlamda uzluksiz tuz to‘planish manbai hisoblanadi. Tuproqlar gidromorf tur bo‘yicha rivojlanadi, yig‘ilgan tuzlar muntazam ravishda drenaj va sho‘r yuvish yordamida chiqarib tashlanadi. Bunda agar drenaj suvlari bilan oqib chiqayotgan tuz miqdori, kirib kelayotgandan ko‘p bo‘lsa, salbiy tuz muvozanati (balansi) kuzatiladi, teskari holatda ijobiy rivojlanish ro‘y beradi. Sho‘rlangan tuproqlar melioratsiyasining mohiyati aynan suv-tuz muvozanatiga erishishga qaratilgan.

Grunt suvlarining minerallashuvi ko‘pincha tuproq sho‘rlanishining darajasini belgilaydi: grunt suvlari qancha ko‘p minerallashgan bo‘lsa, tuproq grunt (zamin) shunchalar ko‘p sho‘rlanadi. Kuzatuvlar ko‘rsatadiki, nam (grunt suvlari)ning yotiq (gorizontal) oqimi qancha sekin bo‘lsa, tuproqda tuz to‘planishi shuncha jadal ro‘y beradi, tuz tarkibida xlorid va natriy ionlarining hissasi orta boradi. Bu hodisa, ayniqsa oqimsiz delta tekisliklari, Orol dengizi qurigan qismlarining tekis yuzalarida kuchli tarzda davom etmoqda. **Yer usti suvlari.** O‘zbekistonning qurg‘oqchil sharoitida landshaftlarning gidrologik xususiyatlarini hisobga olish yetakchi ahamiyatga egadir. Chunki interazonal va gidromorf (subakval va superakval) tabiiy majmualarning shakllanishi suv ob’ektlari ta’siri bilan bog‘liq, qaysiki landshaftlarning faoliyat tartibi va rivojlanishiga yer usti suvlarining ta’siri natijasida ularning mahsuldorligi nisbatan yuqoriligi (gidromorf, chuchuk suvlilar avtomorfga qaraganda bir necha marta boy) kuzatiladi.

Respublikaning tekislik qismida, cho‘llarning oqimsiz botiqlariga vohalardan chiqadigan drenaj va oqova suvlarining tashlanishidan hozirgi vaqtda turli kattalik va hajmdagi sun’iy ko‘llar vujudga keldi. Bu ko‘llar (Arnasoy, Aydar, Dengizko‘l, Sariqamish, Qorateren va b.) atrofida sohildan ma’lum masofagacha gidromorf va yarim gidromorf tabiiy majmualar shakllanadi va shakllanmoqda. Shu vaqtning o‘zida shunga o‘xshash ko‘llarning qurigan o‘rinlarida odatiy sho‘rxok (gidrogalofit) geotizimlar rivojlanishda davom etmoqda. Demak, gidromorf va subakval tabiiy majmualarni qurg‘oqchil tendensiyadagi o‘zgarishlarini prognozlashtirishda bunga e’tibor qaratish zarur.

Yer usti suvlari – sug‘orish davrida tuproqda tuz akkumulyatsiyasining manbaidir, suvning minerallashuv darajasi esa sug‘oriladigan yerlarning sho‘rlanish darajasini belgilaydi. Bu hodisa keyingi yillarda Amudaryo va Sirdaryo havzasiga drenaj va shunga o‘xshash toifadagi suvlarni tashlanishidan daryo suvlarining sho‘rlanishi yildan-yilga barqaror ortib borayotganligida namoyon bo‘lmoqda.

Yer usti suv oqimlari (Amudaryo, Qashqadaryo, Sheroboddaryo va b.) sug‘oriladigan yerlarga ko‘plab miqdorda cho‘kindilarni keltiradi (20 dan 50 m^3/ga), natijada kanallarning o‘zanlari va suv omborlarining tubini jadal loyqa bilan

to‘lishi kuzatilmoqda. **Tuproq qoplami** – yerlarning sug‘orma va lalmi dehqonchilikda foydalanish imkoniyati, ularning tuz tartibi, tabiiy mahsuldorligi, sug‘orish me’yorlari, deflyatsiya yoki suv eroziyasiga moyilligi va boshqalarni belgilaydi; boshqa omilar qatorida yerlarning meliorativ xarakterini ham belgilashga qodir. Tuproq turi ko‘pincha turli darajadagi tabiiy drenajlangan hududga mos keladi: ayniqsa, bo‘z (oddiy) tuproqlar elyuvial sharoitlar rivojlanishi bilan bog‘liq bo‘lgan tog‘oldi qiyaliklarining tabiiy drenajlangan qismida joylashadi; taqir tuproqlar va taqirlar, sho‘rxoklar odatda subakval delta va allyuvial terrasalarning tabiiy drenajlanmagan tekisliklarida rivojlanadi. Shunday qilib, tuproq turiga asoslanib, uni o‘zlashtirish natijasida yerning yoki landshaftning kelajakdagi holatiga oldindan baho berish mumkin.

Mexanik tarkib – tuproq gidrografik tavsifining asosiy omilidir. Tuproq qanchalik “yengil” (tuproq zarralari yirikroq) bo‘lsa, uning suvni saqlash qobiliyati shunchalik kam, ammo o‘tkazuvchanligi ya’ni shimilish (filtratsiya) koeffitsenti katta bo‘ladi (Ye.Zelichenko va b., 1981, 167-b). Tuproqning mexanik tarkibi grunt suvlari sathining ko‘tarilish balandligi, namlikning bug‘lanish tezligi va balandligini belgilaydi. Tuproqning og‘ir mexanik tarkibi aeratsiya mintaqasida grunt namligining tezda ko‘tarilishiga mos kelishi dalillangan. Loyqali-loyli zaminli deltalarni o‘zlashtirishning birinchi yillarida grunt suvlari sathining ko‘tarilish tezligi yiliga 1-2 m dan 3 m gacha boradi. Qoraqum kanali mintaqasidagi delta tekisliklarida bu ko‘rsatkich 1,1-1,2 m/yilni tashkil etadi.

Tuproqning *suv-tuz* tartibi yerlarning meliorativ holatini belgilovchi bosh omil hisoblanadi. Aeratsiya mintaqasidagi tuz miqdori mavjudligiga asoslanib va sho‘rlanishning rivojlanish tendensiyasini aniqlab, maxsus geotizimlardagi yerlarning meliorativ holatiga prognoz berish mumkin. Bunda tuproqning turi, fizik va kimyoviy xossalari sug‘orish maydonlaridagi meliorativ holatning genezisi va keyingi rivojlanishini asoslashda asosiy material bo‘lib xizmat qiladi.

O‘rta Osiyoning arid mintaqasi tuproqlarining turlicha chuqurliklarida suvda tez eruvchi tuzlar mavjud, ular qoplama to‘rtlamchi davr yotqiziqlarining tabiiy-geokimyoviy sharoitda gipergenezi natijasida shakllanganligi ma’lum.

Oqimsiz delta tekisliklari sharoitida qoldiq tuzlarning sug‘oriladigan tuproqlar tuz tartibining shakllanishidagi ishtiroki, ayniqsa jadal bo‘ladi. Shu bilan bog‘liq holda delta yerlarining meliorativ holati yomonlashadi, ulardagi ijobiy tuz muvozanati melioratsiyalashni ancha qiyinlashtiradi.

Tog‘oldi tekisliklaridagi deltalarning yuqori qismi yer osti oqimi bilan yaxshi ta’minlangan, chunki hududda barqaror yotiq (gorizontal) suv almashinuvi mavjud. Bu yerda yerlarning meliorativ holati suv – eroziya va suffoziya-karst jarayonlariga bog‘liq. Tuproq rivojlanishining elyuvial tartibi sug‘orishning avtomorf meliorativ tartibiga mos keladi.

O‘simliklar. Fitotsenozlar holatining tahlili asosida ularning kelajakdagi mumkin bo‘lgan o‘zgarishlari to‘g‘risidagi zarur hajmdagi axborotlarni aniqlash mumkin. Cho‘l va voha o‘simliklarini ko‘p yillik kuzatishlar shundan dalolat beradiki, inson ta’siriga uchragan o‘simliklar qoplami turlicha hayot bosqichida bo‘ladi. Jadal mol boqiladigan qumli cho‘l yaylovlari tez sur’atlarda

transformatsiyalanadi. Bu hodisa, ayniqsa kuniga 1000-5000 ta qo‘ylar suv ichadigan quduqlar yaqinida kuchli ro‘y beradi. Suv ichgani kelgan qo‘ylar qum yuzasini oyoq osti qiladi (toptalaydi). Ular bo‘sh g‘ovak holatda bo‘ladi, shamol ularni uchirib mustahkamlangan qumli oddiy relyefni o‘zgartirib, yalang barxan va barxan zanjirlarini yuzaga keltiradi. Mol boqish ta’sirida nafaqat relyefning xarakteri va shakllari, balki o‘simlik qoplami ham o‘zgaradi. Shuvoq-efemerli yaylovlar o‘rnida buta-efemerli, ya’ni qator o‘simlik turlarining yo‘qolishi natijasida juzg‘un, singren, shuningdek adrasman, selen, astragal va boshqalar paydo bo‘ladi. O‘simliklarning har bir turi grunt suvlari tartibining holati, tuproqning suv-tuz tartibi, shuningdek u yoki bu tuproq qoplami turining rivojlanish bosqichi yoki evolyusiyasi to‘g‘risidagi ma’lum axborotlarni o‘zida saqlaydi. O‘simliklarning axborotli xossalarining tahlili asosida biotsenozlar tarkibining kelajagi to‘g‘risida aniq prognoz berish mumkin.

To‘qay o‘simliklariga xos yulg‘un (taroqchi, tamariks) uyushmasi grunt suvlarining sathi yer yuzasiga yaqin bo‘lgan, minerallashuvi har litrda 3 dan 10-15, hatto 20 g va undan ortiq bo‘lgan sharoitda rivojlanadi. Biroq u grunt suvlari sathi 5 m dan chuqurda bo‘lgan sharoitda ham o‘sishi mumkin. Yulg‘unlilarning keng tarqalishi botqoq, botqoq – o‘tloq va qayir – allyuvial tuproqlarning o‘tloq – taqir, oddiy sho‘rxoklarni taqir tuproqlar evolyusiyasidan dalolat beradi.

Demak, grunt suvlari tartibining o‘zgarish fonidagi tuproq evolyusiyasi natijasida biotsenozlarning trasformatsiyalanishi sodir bo‘ladi. Bu fitotsenozlar kelajakdagi holatini prognozlash uchun ishonchli axborot hisoblanadi.

Tabiiy majmualarning prognozli – axborot xossalari ularning tuzilmasini tashkil etuvchi tabiiy komponentlarning xossalarini tahlili asosida aniqlanadi, biz unga yuqorida guvoh bo‘ldik. Mazkur ishda cho‘l landshaftlarining bu xossalarini aniqlashda landshaftogenez va tuzilmaviy – tadrijiy holati bo‘yicha yetarli darajada o‘rganilgan tabiiy geografik majmualarning ustuvorlari hisoblanmish O‘zbekistonning subaeral va dengizbo‘yi delta geotizimlari misolida asoslashga jazm etdik.

Quruq deltalarning landshaft hosil qiluvchi komponentlarining o‘zaro aloqadorlikdagi tahlili, biogen, gidrogen va boshqa komponentlari yaqindan o‘zaro aloqa hamda o‘zaro borliqdagi bir butun yaxlit geotizim sifatida qarashga imkon beradi. Deltalar yaxlit tabiiy geografik majmua sifatida ichki tuzilmasi, ichki qo‘shilma (tekstura)si, o‘zgarish tendensiyasi va tabiiy resurslardan foydalanish xarakteri hamda boshqa xususiyatlarga ega bo‘lgan landshaft tadqiqotlarining o‘ziga xos ob’ekti hisoblanadi. Delta geotizimlarining majmuali tahlili uning tabiiy boyliklaridan foydalanish bo‘yicha boshqa ilmiy va amaliy masalalarni yechish uchun ham juda zarurdir.

Deltalar ichki tafovutlari bo‘yicha landshaft hosil qiluvchi komponentlarining xossalariga qarab bir-biridan farqlanuvchi tabiiy izolyatsiyalangan majmualarga differensiyatsiyalanadi. Bu yerda geotizimlarni aniqlashning asosiy me’zoni hududning bir xildagi litologik – geomorfologik tuzilishi hisoblanadi, qaysiki u getizimlarning yanada kichik tabiiy geografik birliklarga bo‘linishida yetakchi ko‘rsatkich bo‘la oladi. Delta sharoitida boshqa

komponentlarning makonda o‘zgarishlari ham litogen tuzilishga bog‘liq bo‘ladi. Shu boisdan geologik – geomorfologik tuzilmalarning chegaralari qanchalik aniq belgilansa, ajratiladigan andozalarning shartliligi shunchalar katta bo‘ladi.

Tog‘oldi deltalarining litologik – geomorfologik tuzilishining tahlili asosida ularda o‘zaro keskin farqlanuvchi uchta qism yoki uchta geotizimlarni ajratish mumkin bo‘ladi: yuqori, o‘rta va quyi. Yuqori qism – bu yirik (dag‘al) yotqiziqlar bilan qoplangan, usti yupqa mayin (mayda) tuproqli qiya tekislik; o‘rta qism – bu qumli – loyqali – loyli jinslar bilan qoplangan, alohida toshli qatlamlar tig‘simon ko‘tarilib turuvchi yassi tekislik; oxirgi quyi qism – bu loyli – loyqali – qumoqli yotqiziqli oraliq qatlam va qum linzalaridan iborat bo‘lgan tekis yuzalardir. Tog‘oldi deltalarining mana shu uchta qismlari gidrogeologik jarayonlarning uchta oblasti yoki mintaqasiga mos keladi: bular yutilish (grunt suvlarining to‘yinish), tashish – siqib chiqarish va tarqalish (cho‘kish) mintaqalaridir.

Shuningdek tuproq qoplami ham deltaning yuqori qismidan chekka qismlarigacha asta-sekin o‘zgaradi: yuqori qismda elyuvial tuproqlar (suv eroziyasi rivojlanuvchi mintaqa), o‘rta qismda gidromorf (chala o‘tloq, o‘tloq kabi tuproqlarning rivojlanish mintaqasi), chekka qismlarda yarim gidromorf yoki gidromorf (sho‘rxoklangan tuproqlarning rivojlanish mintaqasi) tuproqlar rivojlanadi. Barcha tog‘oldi deltalarining o‘zlashtirilishi oqibatida ularda tabiiy o‘simliklar deyarli saqlanmagan, shuning uchun ekotizimlardagi qonuniyatlarni aniqlash ancha qiyin.

Shunday qilib, deltalarning barcha uchta qismlari bir-birlaridan keskin farq qilgan holda barcha individual landshaft xususiyatlari bilan makonda mustaqil geotizimlarni vujudga keltiradi. Biroq, bu geotizimlar shunday o‘zaro aloqada bo‘ladiki, ularni bir-birlaridan ajratib bo‘lmaydi. Deltalarning yuqori qismi yuvilish (eroziya) hududi sifatida suvni singdiradi (yutadi), butun havza bo‘yicha transportirovkalanadigan eng qo‘pol (dag‘al) va yirik moddalarni akkumulyatsiyalaydi, suyuq va qattiq moddalarni delta geotizimlarining barcha hududlarida akkumulatori va migratsiya yo‘naltiruvchisi sifatida xizmat qiladi.

Deltalarning o‘rta qismi suyuq moddalarni haydash – siqib chiqarish hududi sifatida ularni bug‘lantiruvchisi va aeratsiya mintaqasida tez hamda qiyin eruvchi tuzlarni akkumulyatsiyalovchi vazifasini o‘taydi.

Deltalarning chekka qismlari grunt suvlari oqimini taqsimlovchi va ularni bug‘lanishga sarflovchi, tuproqning tub qatlamida tuzlarni filtrlovchi hamda akkumulyatsiyalovchi hudud hisoblanadi, bu yerda oqim o‘zanlari bo‘yicha cho‘kindilarning cho‘kishi (sedmintatsiyasi) kuzatiladi.

Tog‘oldi deltalarida geotizimlar joylashuvining qonuniyati asosida tabiiy alohida qismlarda mujassamlashgan aniq zonallikni aniqlash mumkin. **Yuqori qismga** loyqa – shag‘alli tabiiy jadal drenajlangan, sug‘oriladigan och va oddiy (tipik) bo‘z tuproqli qiya tekisliklar; **o‘rta qismga** shag‘al – loyqa – loyli juda sust (jadal sun’iy) drenajlangan sho‘rlangan o‘tloq, o‘tloq – chala o‘tloq tuproqlar majmuasida turli darajada sho‘rlangan sug‘oriladigan o‘tloq tuproqli yassi tekisliklar; **chekka qismlarga** loyqa – qum – loyli drenajlanmagan (jadal sun’iy

drenajlangan) turli darajada sho‘rlangan sug‘oriladigan o‘tloq tuproqli tekis yuzalar harakterlidir.

Ushbu geotizimlar zonalligi mukammal tuzilishga ega bo‘lgan deltalar uchun xarakterlidir. Ayrim deltalar ham mavjudki, qaysiki chekka qismlari daryo vodiysi bilan kesilgan (Sangardak, To‘polang, Kosonsoy, Namangansoy va boshqa deltalar), ularning geotizimlari boshqacha xarakterga ega, ularda grunt suvlari chuqurda joylashgan va tuproq sho‘rlanish jarayonlari sodir bo‘lmaydi.

Tekislik deltalari ham shunga o‘xshash xossalarga ega, biroq ularda yuqorida ta’kidlanganidek, mayin jinsli yotqiziqlarning katta qalinlikda tarqalganligi, ko‘pincha ostida loyli, qumli va konglomeratli to‘rtlamchi davrgacha bo‘lgan yotqiziqlarning bo‘lishi, shuningdek relyef yuzasining kam nishabligidan yuqorida ajratilgan mintaqalar maydoni ancha farqlanadi. Aksariyat hollarda deltaning o‘rta va chekka qismlarini egallagan geotizimlar eng keng tarqalgan bo‘ladi, yuqori qism ko‘pchilik deltalarda unchalik katta bo‘lmagan hududlar uchun xarakterli, bu ularning gipergenez davrida yirik bo‘lakli yotqiziqlarning akkumulyatsiyasi xarakteri va tog‘ tizmalaridan ancha uzoq masofada joylashganligi bilan bog‘liq.

Tekislik deltalarida mayda (mayin) yotqiziqlarning kuchliligi (qalinligi) va grunt suvlarining kamligi bilan bog‘liq tarzda grunt namligining siqib chiqarilishi kuzatilmaydi, ular yer yuzasiga 5-10 m gacha, ba’zan undanda kamroq yaqin joylashadi. Shu boisdan tuproqlar ko‘p hollarda tabiiy sharoitda elyuvial xarakterga ega bo‘ladi. Bular Qadimgi Zarafshon, Qashqadaryo subaeral deltalariga tegishlidir. Sug‘orish tufayli barcha tekislikdagi quruq deltalarning grunt suvlari minerallashgan gidromorfizm xossasiga ega bo‘ladilar.

Dengizbo‘yi deltalarida geotizimlarning zonalligi tog‘oldi deltalarinikidan farqli o‘laroq, asosan daryo o‘zanidan chekkaga tomon yo‘naladi. Bu o‘zan va uning atrofida uzluksiz ravishda yotqiziqlarning akkumulyatsiyasi natijasida daryoning asosiy o‘zani yoki tarmoqlarida kuchli o‘zanbo‘yi tepa (baland)liklarining joylashganligi bilan izohlanadi. Amudaryo o‘zani Nukus shahridan to dengiz sohiligacha yer po‘stining ko‘tarilishi sodir bo‘layotgan yoriqli mintaqada joylashgan. Dengizbo‘yi deltalarida ham huddi tog‘oldi va tekislik deltalari singari o‘zanning bir qancha tarmoqlarga ajralishi deltaning yuqori qismidan boshlanadi, shunga monand yer osti suvlari orqali suyuq moddalarning migratsiyasi ham deltaning yuqori qismidan pastki (yig‘ilish) maydonlari tomon yo‘nalishda amalga oshadi.

O‘zanlararo pastqamliklar – yer osti va yer ustki oqimlarining akkumulatorlari hamda bug‘lantiruvchilari, qattiq oqim va tuzlarni to‘plovchilari hisoblanadi. Kuchli (baland) o‘zanbo‘yi balandliklari va o‘zanlararo pastqamlik mintaqasi ortidan odatda yoki tarqoq qumlar yoki sho‘rlar bilan majmuadagi ko‘llar keladi. Orolbo‘yi deltada eng chekka mintaqa ko‘llar va sho‘rlar (Sudoche ko‘li, Karaumbet va b. sho‘ralar) bilan band, qaysiki delta yer osti oqimining to‘planish maydoni yoki pastga tushirish o‘chog‘i hisoblanadi, buning ustiga yer osti suvlarining sathi atrof tekisliklarga nisbatan ancha pastda (taxminan 10-12 m ga) turadi.

Aniqlangan asosiy tabiiy – geografik xususiyatlar asosida dengizbo‘yi deltalari geotizimlarining zonalligini aniqlash mumkin. Dengizbo‘yi deltalarining asosiy arteriyasi uning o‘rta mintaqasidan o‘tadi, u kuchli o‘zanbo‘yi balandliklaridan iborat, qaysiki o‘zan yotqiziqlari va relyefning o‘yilganligi (0-8 m va undan ortiq) yetakchiligidan grunt suvlari kam sho‘rlangan, asosan gidrokarbonat – sulfat tarkiblidir. Shunga bog‘liq tarzda yer osti oqimining ta’minlanganligidan tuproqda ko‘p miqdorda tuz to‘planishi ro‘y bermaydi. Asosiy daryo tarmoqlari bo‘yida joylashgan allyuvial – delta tekisliklaridagi yuzasi o‘yilgan qumoq – qumli balandlik maydonlardagi o‘tloq – taqir – to‘qay va allyuvial o‘tloq tuproqlardagi to‘qay o‘rmonlari o‘zanbo‘yi balandliklarining xarakterli xususiyatidir.

O‘zanlararo pastqamliklar, qamishlar o‘sib turuvchi ko‘l va botqoq majmualarining ko‘pligi, hududning oqimsizligi bilan farqlanadi, ularga quyidagilar xos: allyuvial – o‘tloq, o‘tloq – botqoq tuproqlardagi qamishzorli o‘zanlararo loyqa-loyli pastqamliklar; ba’zi joylarda qamishzorlardan iborat bo‘lgan oddiy botqoq va ko‘lli o‘zanlararo pastqamliklar.

Ko‘l botiqlari ko‘pincha dengizbo‘yi deltalarining eng chekka qismlarida mujassamlanadi va quyidagi majmualari bilan xarakterlanadi: qamish va mushukbo‘yi o‘suvchi, atrofida botqoqlashgan mintaqali ko‘llardan iborat bo‘lgan oqimsiz botiqlar; o‘simliklarsiz sho‘rlardan tashkil topgan oqimsiz loyli-loyqali pastqamliklar.

Shunday qilib, dengizbo‘yi deltalari uchun asosiy o‘zandan boshlanuvchi quyidagi geotizimlar xosdir: o‘zanbo‘yi balandliklari, o‘zanlararo pastqamliklar va ko‘l (sho‘rxok)li oqimsiz botqoqlar. Bu geotizimlar V.I.Popov (1990) va boshqalar tomonidan Amudaryo deltasida ajratilgan asosan fatsial mintaqalarga mos keladi.

Deltalardagi geotizimlarning zonalligini aniqlash ulardagi sug‘oriladigan yerlarda melioratsiyani differensial qo‘llashga mos keladi, agrotexnik, agromeliorativ, gidrotexnik va tashkiliy – xo‘jalik tadbirlarning samaradorligini oshiradi.

Subaeral delta landshaftlarining tuzilmaviy – tadrijiy o‘zgarish (dinamik) holatini har tomonlama tahlili shuni ko‘rsatadiki, ular o‘zida katta hajmdagi prognozli-axborotlarni saqlaydi, qaysiki tabiiy salohiyatdan foydalanish miqiyosining ortib borishi bilan bog‘liq tarzda ulardagi o‘zgarishlarni prognozlashtirishda foydalanish zarur. Bunda subaeral delta tabiiy majmualarining u yoki bu turlari, ko‘pincha regional xususiyatlarga ega bo‘lgan differensiyatsiyalanishiga e’tibor qaratmoq lozim.

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ARID MINTAQA LANDSHAFTLARINING ANTROPOGEN TRANSFORMATSIYALANISHI VA O'ZGARISH TENDENSIYALARI

Annotatsiya: *Maqolada O'zbekiston arid mintaqa landshaftlarining tabiiy komponentlari va tabiiy majmualarining prognozli-axborot xossalari ochiqlangan. Landshaftlar o'zgarishining umumiy yo'nalishi va xarakterini, tabiiy, tabiiy-antropogen jarayon va hodisalarining tezligi yoki jadalligi ochib berilgan.*

Kalit so'zlar: *agroiqlim, relyef, harorat, atmosfera bosimi, havoning namligi, bug'lanish, yog`in, zonallik, arid, gumid, ekstragumid.*

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ANTHROPOGENIC TRANSFORMATION AND CHANGE TRENDS OF LANDSCAPES OF THE ARID ZONE

Annotation: *The article reveals the predictive and informational properties of the natural components and natural complexes of the landscapes of the arid region of Uzbekistan. The general direction and nature of landscape changes, the speed or intensity of natural, natural-anthropogenic processes and phenomena are revealed.*

Keywords: *agroclimate, relief, temperature, atmospheric pressure, air humidity, evaporation, precipitation, zonality, arid, humid, extrahumid.*

Kirish. O'zbekistonning arid mintaqasidagi yerlar ulkan iqtisodiy salohiyatga ega. Mintaqa sug'orma dehqonchilik, yaylov chorvachiligi, kimyo hamda tog'-kon sanoatini yanada rivojlantirish uchun juda istiqbolli hisoblanadi. Hozirda mintaqada ko'plab zamonaviy shahar va qishloqlar, sanoat markazlari, yirik chorvachilik majmualari, yo'llar, kanallar, quvur tarmoqlari hamda boshqa infratuzilmalar bunyod etilgan. Biroq, shu bilan birga mintaqa tabiiy resurslarini aniqlash va oqilona foydalanishga yondashuvlar darajasi, ko'lami va usullari hozirgi bozor iqtisodiyoti sharoiti talablariga javob berishdan ancha uzoqdir.

Arid mintaqa landshaftlariga antropogen ta'sirning jiddiy kuchayib borishi, ya'ni yer-suv resurslaridan nooqilona foydalanish, yerlarning meliorativ holatiga yetarli darajada e'tibor bermaslik, almashlab ekishni to'g'ri amalga oshirmaslik, yaylovlardan noto'g'ri foydalanish va shunga o'xshash boshqa holatlar landshaftlarning kuchli darajada antropogen transformatsiyalanishiga, natijada

ekologik vaziyatning buzilishiga olib kelmoqda. Bu esa mintaqa landshaftlarining deyarli barcha majmualarida turli nomaqbul tabiiy va tabiiy-antropogen jarayonlarning rivojlanishiga sabab bo‘lmoqda. Ayniqsa, cho‘llanish jarayonining rivojlanishi arid mintaqa landshaftlarining biologik mahsuldorligi, yaylovlar sig‘imi, qishloq xo‘jalik ekinlari hosildorligi hamda aholi turmush darajasining pasayishiga olib kelmoqda.

Ustyurt platosining o‘zlashtirilishi va transformatsiyalanishining hal qiluvchi omili ikkinchi jahon urushidan keyingi yillarda bu yerda tabiiy gaz konlarining ochilishi, Qo‘ng‘irod-Beynov temir yo‘l tarmog‘ining yotqizilishi va Buxoro-Ural hamda Markaziy Osiyo – Markaz magistral gaz quvurining o‘tkazilishi hisoblanadi. Biroq, platoda inson xo‘jalik faoliyati juda qadimiyligini dalilovchi manbalar yetarli. Xususan O‘zbekiston Respublikasi Fanlar Akademiyasining akademigi O.M.Akromxo‘jaev o‘z estaliklari (“Hayot saboqlari”, T., 2019)da shunday yozadilar: “Men shogirdlarim va hamkasblarim bilan birga 1956-60 yillarda Ustyurtni har tomondan aylanib chiqqanman. Shunda bir vaqtlar ohaktosh va marmartoshlardan qurilgan katta maqbaralar, naqsh ishlangan ko‘hna toshlarni o‘z ko‘zim bilan ko‘rdim. Bu esa bir vaqtlar bu yerlarda o‘t-o‘lanlarga serob yaylovlar bo‘lganidan, unda juda ko‘p yurtalarda boyvachcha qozoq va qoraqalpoq chorvadorlari yashaganliklaridan darak beradi. Shu sababli Ustyurt nomini Usti – Yurt so‘zidan kelib chiqqan desam yanglishmasam kerak. O‘sha vaqtlarda bu bepoyon dasht obod yurtlardan iborat, u yerda hozir ham saqlanib qolgan quduqlarning suvi yer yuzasiga yaqin va mo‘l, iqlim sharoitlari anchagina mo‘tadil bo‘lgan bo‘lsa kerak. Hozir bu quduqlarning ko‘pi quruq, suvsiz, faqat ba’zi quduqlarning tagida suv uchrab turadi, u ham bo‘lsa sho‘r suv. Shuning uchun ham Ustyurt bir necha 100 yillardirki adadsiz dasht – biyobon bo‘lib qoldi” .

Qizilqum, Qarshi cho‘li, Ustyurt platosida keyingi vaqtlarda ma’danlarni qidirish, neft va tabiiy gaz qazib olish va boshqa maqsadlarda keng miqyosda texnologik jarayonlar amalga oshirilmoqda. Buning oqibatida katta maydonlarda yaylovlar yaroqsizlanmoqda, ya’ni harakatdagi qumlar maydoni kengayishi tufayli qorako‘l qo‘ylari boqiladigan tabiiy yaylovlarda degredatsiyaning kuchayish tendensiyasi yuz bermoqda. Bu hodisa vohalar bilan cho‘llar tutashgan mintaqalarda ham kuzatilmoqda.

Qizilqum, Qarshi cho‘li va Ustyurt platosida neft, gaz va boshqa ma’danlarni geologik-qidiruv jarayonida zaminni chuqur burg‘ulash natijasida eng avvalo, o‘sha joyning o‘simlik olami, keyin esa tuproq, relyef sharoitlari chuqur o‘zgarishlarga mubtalo bo‘lmoqda. Qizilqum va Ustyurtda 4 – 5 km chuqurlikka qadar har bir burg‘ulash jarayonida egallagan maydon 30 – 40 gektarga yetdi, chunki burg‘ulash uchun zarur bo‘lgan turli texnika, asbob-anjom, uskuna, metall quvurlar, omborxonalar, mutaxassislarning yashash joylari va boshqa zaruriy ehtiyojlar uchun maydonlar ajratiladi. Burg‘ulash tugagandan so‘ng ushbu maydon „o‘lik“ holga keladi, chunki ayni burg‘ulash maydonchasi (100 m radius)da mavjud bo‘lgan barcha o‘simlik turlari butunlay yo‘qoladi, tuproqning yuqori qatlami obdon buziladi, burg‘ulash ishini olib borish davomida avtomobil, traktorlar harakati, metall quvurlarni tashish paytida o‘simlik va tuproq eziladi, toptaladi, neft

mahsulotlari to‘kiladi, xohlagan joydan yer qaziladi, tekislanadi va boshqa shu kabi yumushlar natijasida avvalgi tabiiy holat buziladi, burg‘ulash maydonchasidan nariroqdagi yerlar odam va texnikaning betinim harakati, turli chuqurliklar qazish ishlari tufayli o‘zining tabiiy xususiyatlarini yo‘qotadi. Ustyurt platosida neft-gaz qidiruv ishlari natijasida hozirda 25 dan ortiq neft va gaz konlari ochilgan. Ushbu tarmoqning rivojlanishi hamda u bilan bevosita bog‘liqlikdagi boshqa infratuzilmalarning kengayishi plato landshaftlarining yaxlitligi uchun xavfning tobora ortib borishiga sabab bo‘lmoqda. Platoda neft, gaz va boshqa foydali qazilmalarni qazib olish bilan hozirda 30 dan ortiq turli kompaniyalar shug‘ullanayotganligi ma’lum. Qidiruv va konlarni ishga tushirish hajmining ortib borishi atrof-muhitga sezilarli ta’sir ko‘rsatmoqda. Umuman, burg‘ulash ishlari olib borilgan maydonlar va uning atrofida uzoq vaqtga qadar ekologik muvozanat butunlay buzilib, nohush hodisalar rivojlanadi, ekologik komponentlar orasidagi o‘zaro bog‘liqlik ishdan chiqadi, tabiiy jarayonlarning (masalan, shamol harakatining) ustunligi tufayli yangi relyef shakllarining hosil bo‘lishi yuz beradi. Shu narsani e’tiborga olish kerakki, cho‘llarda burg‘ulash ishlari ancha katta maydonlarda olib boriladi. Shuning uchun bu maydonlarda ekologik vaziyat yomon ahvolda. Binobarin, bu hol o‘z navbatida yaylovlardan foydalanish koeffitsientining kamayishiga olib keladi.

1975-1991 yillar mobaynida Qoraqalpoq Ustyurtining 1,2 mln ga qismidan harbiy poligon sifatida foydalanilgan. Bundan o‘simlik, hayvonot dunyosi va tuproq katta zarar ko‘rgan. Qizilqum, Qarshi cho‘li va Ustyurt platosi O‘zbekiston Respublikasida chorvachilik, ayniqsa yaylov xo‘jaligi keng rivoj topgan hududlardan hisoblanadi. Bu yerda chorva mollarining, ayniqsa ko‘p sonli qorako‘l qo‘ylarining yil davomida uzluksiz boqilishi, cho‘l ekotizimlarining hozirgi holatiga, mahsuldorligiga, fitotsenozlar tarkibidagi o‘simlik turlarining tadrijiy kamayib borishiga ta’sir etadi. Agar arid mintaqada chorva mollari sonining nisbatan ko‘pligini e’tiborga olinsa, uning yaylovlariga bo‘ladigan ta’sir oqibatlari yanada oydinlashadi (4.7-jadvalga qarang). Shuning uchun arid landshaftlar doirasida antropogen cho‘llanish jarayonlarini jadallashtirishda yetakchi omillardan biri bo‘lib chorva mollarini muayyan joylarda haddan tashqari boqilishi xizmat qiladi (4.1-chizmaga qarang).

4.7-jadval

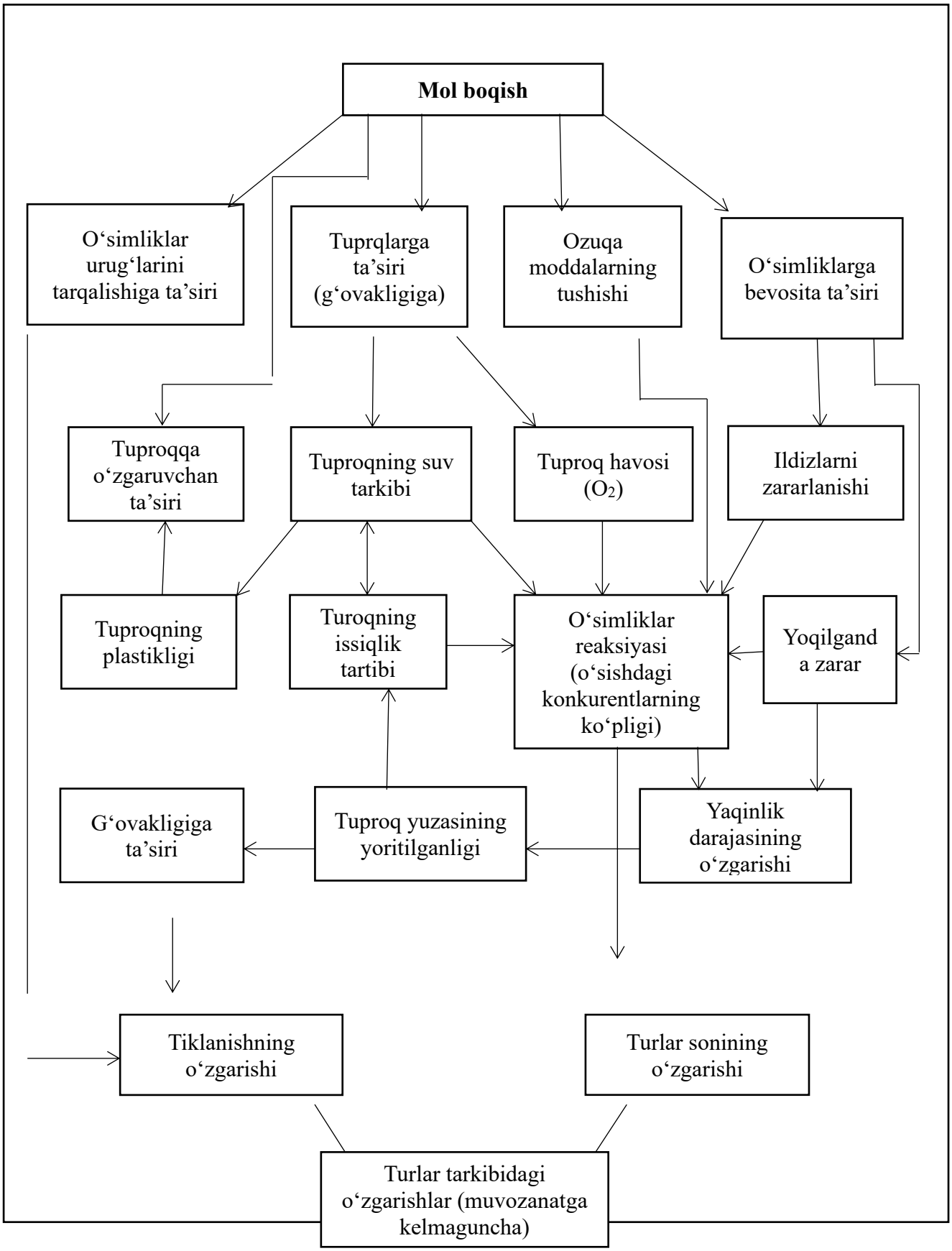
Mintaqaga mos viloyatlar bo‘yicha asosiy chorva mollarining soni (1.01.2023)

№	Viloyatlar	Ming bosh			
		Qo‘y va echkilar	Yirik shohli qoramollar	Yilqilar	Tuyalar
1	Qoraqalpog‘iston Respublikasi	1 178,0	1 160,3	28,0	22,1
2	Buxoro	2 303,3	1 280,1	7,6	12,2
3	Qashqadaryo	4 893,3	1 644,1	35,7	8,3
4	Navoiy	2 321,0	508,7	23,4	45,7
5	Xorazm	471,0	949,8	5,5	-
Respublika bo‘yicha		23 074,3	13 311,3	278,8	20 000

Jadval statistik ma’lumotlar asosida muallif tomonidan tuzilgan.

Yaylovlarining suv bilan kam ta’minlanganligi, quduqlar to‘rining nihoyat darajada siyrakligi cho‘llanish jarayonini yanada murakkablashtiradi. Quduqlardan 2 – 3 km radiusdagi maydonlarda cho‘llarning tub o‘simliklari me’yordan ortiqcha mol boqilishi va ularni tevarak-atrofdan suvloq joylarga doimiy ravishda kelib-ketilishi natijasida kuchli o‘zgaradi, quduqlar atrofidagi 0,5 – 0,7 km masofagacha bo‘lgan joylarda tuproqning gumus qatlami to‘liq yo‘qoladi. Oqibatda quduqlar atrofida deflyatsiya jarayoni kuchayib, ko‘chki qumlar va barxanlar hosil bo‘ladi. Yaylovlarda chorva mollarini haddan tashqari boqilishi fitotsenozdagi o‘simlik turlarining sonini 2 – 4 martagacha, yaylovlar hosildorligini esa 2,4 s/ga dan 1,8 s/ga gacha kamayishiga olib keladi.

Qizilqumning qumli va qumoq cho‘l landshaftlarida chorva mollarining haddan tashqari boqilishi oqibatida mustahkamlangan va yarim mustahkamlangan



4.1-chizma. Yaylovda mol boqishning ta’sir omillari (L.Kurakova, 1976).

qator tepalik hamda do‘ng qumli ekotizimlarning ko‘proq maydoni kuchli degradatsiyalanib, ularning o‘rnida ko‘chma qumlar va barxanlar hosil bo‘lgan. Ma’lumki, cho‘l o‘simliklari tarkibida arid iqlim sharoitiga moslashgan shuvoq, selen, sho‘ra va efemerlar ko‘pchilikni tashkil etadi. Agar cho‘l yaylovlaridan maqsadga muvofiq foydalanilsa, ularda chorva mollari odatdagidek mo‘tadil boqilsa, o‘simliklar zichligi deyarli siyraklashmaydi, ko‘chma qumlar va barxanlar hosil bo‘lmaydi.

Arid landshaft majmualari doirasida cho‘llanish jarayonining faollashib borishida ijtimoiy omillar ham muhim rol o‘ynaydi. Ayniqsa, cho‘l sharoitida mahalliy aholining markazlashtirilgan yoqilg‘i bilan taminlanmaganligi ularni tevarak-atrofdagi cho‘l hududlardan o‘tin tayyorlashga va kundalik turmushda foydalanishga majbur etadi. Qizilqum sharoitida o‘tin, asosan daraxtlardan, butalardan va yarim butalardan tayyorlanadi. Shuning uchun ham aholi yashaydigan manzillarning va vohalarning atrofidagi katta-katta maydonlarda oq va qora saksovullar, qandim, cherkez, qum akatsiyalari kabi daraxtsimon va buta o‘simliklar kesib ketilgan, shuvoqlar o‘rilib juda siyraklashib qolgan (A.Xodjimatov va b., 2020,102-b.).

Ustyurt platosining temir yo‘l, avtomagistral yo‘llari va gaz quvurlari o‘tgan hududlar atrofida, Qizilqumda esa karer, boyitish fabrikasi, terrikonlarga hamda boshqa ob’ektlarga xizmat qiladigan ko‘plab yo‘llar vujudga kelgan. Natijada yo‘llar bo‘yidagi bir necha kilometr kenglikdagi mintaqada tuproq va o‘simlik qoplami butunlay buzilgan. Olib borilgan hisob-kitoblarga qaraganda eni 4 m li yo‘l har 2,5 km masofada 1 ga maydondagi yaylovni ishdan chiqaradi (A.Rafiqov, 2003, 253-b.). Ayniqsa Ustyurt platosida avtomobil g‘ildiragi ezishidan hosil bo‘lgan upadek mayin gips kukuni shamol yordamida atrofga tarqalib, atrofdagi o‘simliklarning me’yorda o‘sishiga ham halaqit qiladi. Yo‘llarning o‘zi ko‘p hollarda shamol va yog‘in – sochinlar ta’sirida deflyatsiya hamda eroziyaga uchraydi.

Sug‘oriladigan yerlardan chiqib kelayotgan zovur suvlari – qaytgan suvlarning bir qismini yana qaytadan Amudaryo va Sirdaryoga tashlanishidan daryo suvlarining minerallashish darajasi yildan-yilga ortib bormoqda (Amudaryoning quyi oqimida suvning sho‘rlanish darajasi har litrda 1,5 – 2,0 g ni tashkil etadi). Vohalarda minerallashuvi yuqori bo‘lgan daryo suvlari bilan ekinlarni sug‘orish tufayli ekin maydonlariga ko‘p miqdorda tuz yotqizilmoqda (1 ga maydonga 9 – 24 t va undan ziyod). Shu bois, ayniqsa arid mintaqada joylashgan vohalarlarda sug‘oriladigan yerlarning sho‘rlanish darajasi ortib bormoqda (4.8-jadvalga qarang). Quyi Amudaryo (Qoraqalpoq, Xorazm) va quyi Zarafshon (Buxoro, Qorako‘l) vohalari hamda Qarshi cho‘li meliorativ holatining og‘irligi bilan tavsiflanadi, grunt suvlarning yotiq harakati to‘liq ta’minlanmaganligi tufayli ularning sathi 1 – 2 m, joylarda 2 – 3 m chuqurda joylashgan. Zovur tarmoqlarining samarali faoliyat ko‘rsata olmayotganligidan tuproqda tuz to‘planishi tezkorlik bilan sodir bo‘lmoqda.

Bundan tashqari Amudaryoning quyi oqimida Tuyamo‘yin suv omborining ishga tushirilishi (1983 yil) bilan yerlarni sug‘orishda tozalangan suvdan foydalanishga o‘tildi. Suv ombori qurilgan joyning atroflari va tubi chuqur tuz qatlamlardan iboratligi nazarda tutilsa, undan chiqishda birinchidan Amudaryo suvining sho‘rlanish darajasi har litrda 2 g ga ortdi

4.8-jadval
O‘zbekistonning arid mintaqasidagi sug‘oriladigan yerlarning sho‘rlanish darajasi (% hisobida 2022, y.)

№	Viloyatlar	Tuproq sho‘rlanishi	
		Jami	Shu jumladan o‘rtacha va kuchli
1	Qoraqalpog‘iston Respublikasi	90,0	38,9
2	Buxoro	95,7	37,6
3	Qashqadaryo	47,9	13,2
4	Navoiy	86,9	33,5
5	Xorazm	100,0	53,1
Respublika bo‘yicha		**52,2**	**18,4**

Jadval statistik ma’lumotlar asosida muallif tomonidan tuzilgan.

(unga quyilishda har litrda 1 g atrofida bo‘lgan), ikkinchidan yiliga o‘rtacha daryo suvi bilan 1 ga maydonga kiradigan 40 t loyqa tarkibidagi 250 kg gumus, 20 kg azot, 50 kg fosfor hamda 1000 kg kaliy o‘g‘itidan mahrum bo‘lindi (B.Ruzmetov, 1992, 29-b.). Uchinchidan loyqaning suv omborida qoldirilishi oqibatida sug‘orishda ishlatiladigan suvlarning sug‘orish kanallaridan shimilishi (filtratsiya) 2,5 martagacha ko‘paydi.

Vohalardagi sug‘oriladigan yerlarning meliorativ holatini yomonlashishining yana bir ahamiyatsiz bo‘lmagan omili Orol dengizining qurigan qismidan (6 mln ga) ko‘tarilayotgan tuz zarrachalarining akkumulyatsiyasi hisoblanadi. Hozirgi ma’lumotlar bo‘yicha ushbu miqdor yiliga 150 mln tonnadan ortiq bo‘lib, ular 800-1000 km uzoqdagi aholi zich yashaydigan vohalargacha kirib bormoqda. R.Razakov (1990)ning aniqlashicha tuz akkumulyatsiyasi Janubiy Orolbo‘yining dengizning tub sohil mintaqasida yiliga o‘rtacha gektariga 800-1000 kg, Nukus shahri kengligida esa gektariga 100 kg tashkil etadi. Albatta, bu ma’lumot qariyb yarim asr avval aniqlangan, unda dengizdagi suv akvatoriyasi hozirgichalik emas edi, demak bu ko‘rsatkich hozirda yanada ko‘payganiga shubha yo‘q.

Arid mintaqa vohalari asosan ochiq makonni ishg‘ol etganligi uchun nafaqat yer usti va yer osti (grunt) suvlari oqimi tufayli, balki shamol yordamida har tarafdan keltirib akkumulyatsiyalanadigan turli moddalar hamda voha agrogeotizimlarida tuproqning yuza qismining uchirilib ketishidan ham transformatsiyalanadi. Arid mintaqa voha agrogeotizimlarining belgilangan me’yor darajasida shamoldan himoya qilinmaganligidan ularda shamol eroziyasining ta’siri salmoqli ekanligini ko‘rish mumkin (4.9-jadvalga qarang).

Yuqoridagi barcha omillar mintaqa landshaftlarining barqaror rivojlanishiga, vohalarda esa qishloq xo‘jalik ekinlarining me’yoriy vegitatsiyasiga salbiy ta’sir ko‘rsatadi (4.4-ilovaga qarang).

Tabiiy majmualarning funksional faoliyatiga tashqi omillarning ta’siri kabi ularda ham dinamik jihatdan ma’lum o‘zgarishlar kuzatiladi, ya’ni geotizimlar u yoki bu yo‘nalishda transformatsiyalanadi. Ko‘pincha bu yo‘nalish yoki tendensiyalarnining o‘zgarishi tabiiy majmualarning tabiiy rivojlanishiga mos

4.9-jadval
O‘zbekistonning arid mintaqasidagi sug‘oriladigan yerlarning eroziyalanish darajasi (sug‘oriladigan maydonga nisbatan % hisobida, 2022 y.)

№	Viloyatlar	Tuproq eroziyasi	
		Suv	Shamol
1	Qoraqalpog‘iston Respublikasi	21,4	97,6
2	Buxoro	2,2	58,5
3	Qashqadaryo	14,6	74,4
4	Navoiy	0,9	11,3
5	Xorazm	0,0	91,6
Respublika bo‘yicha		**18,8**	**55,7**

Jadval statistik ma’lumotlar asosida muallif tomonidan tuzilgan.

keladi va antropogen omillar ta’sirigacha ko‘p kuzatilgan. Bu jarayonda insonning xo‘jalik faoliyatlari bu o‘zgarishlarni tezlashtiradi, umuman olganda landshaftlarning tuzilmaviy – dinamik holatiga mos keladi, lekin sustlashgan yoki ibtidoiy holatda bo‘ladi. Biroq, geotizimlar holatiga tashqi ta’sirning jadalligi natijasida ko‘pincha inson uchun nomaqbul boshqacha o‘zgarishlar tendensiyalari sodir bo‘lishi mumkin. Bu o‘zgarishlar tendensiyalarini aniqlash nafaqat ilmiy, balki amaliy jihatdan ham ahamiyatli, chunki bu o‘zgarishlarning xarakteriga bog‘liq tarzda nomaqbul tabiiy – antropogen hodisa va jarayonlarni bartaraf etish bo‘yicha amaliy chora-tadbirlarning u yoki bu turlari qo‘llaniladi. Boshqa rejada mana shu o‘zgarishlarning tendensiyalari inson xo‘jalik faoliyati ta’sirida bo‘lgan landshaftlarning kelajakdagi holatini prognozlashtirish uchun ham juda zarurdir.

Arid mintaqadagi aholining xo‘jalik faoliyati, ayniqsa tabiiy resurslardan nooqilona foydalanish tufayli ekologik muvozanatning buzilishi va katta maydonlar ko‘lamidagi nomaqbul tabiiy jarayonlarning rivojlanishi kabi ko‘rinishlarda tabiatda o‘z izini qoldirmoqda, arid o‘lkalarda cho‘llanish jarayonlarning rivojlanishiga antropogen omillar katta ta’sir ko‘rsatmoqda. Tabiiy muhitga antropogen ta’sirning har bir turi yoki majmuasi uning ma’lum yo‘nalishda o‘zgarishiga olib kelmoqda. Jumladan tabiiy gaz yoki neftni burg‘ulash arid landshaftlarning texnogen o‘zgarishlariga sabab bo‘lmoqda, jumladan o‘simlik qoplamining yo‘qotilishi, tuproq degradatsiyasi va deflyatsiyasi, tuproq-gruntning

sho‘rlanishi, biotsenozlarning neft mahsulotlari va texnik “axlatlar” bilan ifloslanishi, joy relyefining parchalanishi va boshqalar. Bir vaqtning o‘zida qumli cho‘llarda surunkali mol boqish yaylovlarning degradatsiyasiga (ozuqa o‘simliklarining begonalari bilan almashinuvi, loyihadagi o‘simliklar bilan qoplanishning qisqarishi, quduqlar yaqinida ko‘chma qumlarning paydo bo‘lishi, rivojlanishi va b.) sabab bo‘lmoqda. Qumli cho‘llarda mol boqish tufayli eol jarayonlari rivojlanishining bog‘liqligi, ya’ni landshaftlarning o‘zgarishi va qum zarrachalarining akkumulyatsiyasi hamda qumli tekisliklar yuzasining keyinchalik parchalanish yo‘nalishiga o‘tishining o‘zaro bog‘liqligi asoslangan.

Antropogen omillar ta’sirida geotizimlar o‘zgarishining o‘ziga xos turlarining tahlili ularning o‘zgarish tendensiyalari ko‘pligidan dalolat beradi: yer yuzasining eol parchalanishi, eol va eroziyali parchalanish, tuz to‘planishi va tarqalishi, landshaftlarning rivojlanishidagi texnogen buzilishlar, antropogen cho‘llanish, sug‘oriladigan yerlarning yo‘qotilishi (kamayishi) va ifloslanishi, daryo suvlarining kamayishi va ifloslanishi, atmosfera havosining ifloslanishi va b. (4.5-ilovaga qarang).

O‘zbekistonning arid mintaqasidagi vohalar uchun landshaftlarining barqarorligi, antropogen omillarning xarakteri va yerlarning tuproq-meliorativ holatiga bog‘liq tarzda, asosan: Zarafshon, Qashqadaryo, Sheroboddaryo, Amudaryo, So‘x va boshqalarning delta tekisliklari uchun tuproq osti qatlamida tuz to‘planishi; Chirchiq, Ohangaron, Zarafshon, Qashqadaryoning III va IV terrasalaridagi qiya va do‘ng-tepa lyossli tekisliklarida tuproqning yuvilishi hamda jar eroziyasi; Markaziy Farg‘onaning Qo‘qon guruhi tumanlari, Mirzacho‘l, Dalvarzin, Qarshi va Sherobod cho‘llari hamda Buxoro vohasining janubiy qismlari uchun qumoq-qumli jinslarning shamolda uchirilishi; tuproqlarning tabiiy mahsuldorligiga salbiy ta’sir ko‘rsatuvchi mineral o‘g‘itlar va pestitsidlarni ko‘p miqdorda qo‘llanilishi hisobiga sug‘oriladigan yerlarning yo‘qotilishi hamda ifloslanishi kabilar xosdir (A.Xodjimatov va b., 2023, 229-b.).

Voha landshaftlaridagi bu o‘zgarish tendensiyalarining paydo bo‘lishi va rivojlanishini o‘rganish shuni ko‘rsatadiki, bular yerlarni o‘zlashtirish va sug‘orishning eng boshidayoq xarakterli bo‘lgan (yerlarning kimyoviy zararli vositalar hisobiga yo‘qotilishi va ifloslanishi bundan tashqari). Bu bevosita vohalarning tabiiy-meliorativ sharoitlari bilan bog‘liq tarzda: tabiiy jihatdan yomon drenajlangan grunt – tuz to‘planishiga, qiya va yassi tekisliklar – yerlarning eroziyasi, organik va mineral moddalarning elyuvial landshaftlardan subakvallari tomon yuvilishiga sabab bo‘ladi.

Shunday qilib, voha landshaftlaridagi mavjud o‘zgarish tendensiyalarining paydo bo‘lishi qadimgi davrlardayoq yerlarning o‘zlashtirilishining boshlanishida sodir bo‘lgan. Yerlarning meliorativ holatini yaxshilash maqsadida vohalarda qo‘llanilayotgan barcha tadbirlar landshaftlardagi mana shu tendensiya transformatsiyalanishni o‘zgartirishga yo‘naltirilgan. Biroq, tabiiy muhit, kerakli chora-tadbirlar ta’sirining samaradorligi susaygan yoki umuman yo‘q bo‘lgan joylarda tabiiy tendensiyalar rivojlangan. Shuning uchun geotizimlarning o‘zgarish tendensiyalari xarakterini hisobga olish va tushuntirish nafaqat yerlarning

meliorativ holatini yaxshilash, balki ularning kelajakdagi holatini ishonchli aniqlashda ham muhim ahamiyatga egadir.

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SUG'URTA BOZORINING SHAKLLANISHI VA RIVOJLANISHI

Annotatsiya: *Ushbu maqolada O'zbekistonda sug'urta bozorining shakllanishi va rivojlanishi ko`rib chiqiladi. Unda bozorning hozirgi holati, ishtirokchilari, davlat tomonidan tartibga solish usullari, sug`urta bozorini xorij tajribasi bilan taqqoslab o`rganish hamda sug'urta xizmatlarining kengayish imkoniyatlari tahlil qilinadi. Tadqiqotda mavjud qonunchilik bazasi, statistika ma'lumotlari va ilg'or xalqaro tajribalar asosida tahliliy yondashuv qo'llanilgan.*

Kalit so'zlar: *Sug'urta bozori, rivojlanish, moliyaviy barqarorlik, hayot sug'urtasi, tibbiy sug'urta, mulk sug'urtasi, raqobat, nazorat, prudensial normalar, raqamlashtirish, innovatsiyalar, konsentratsiya, talab, xorijiy tajriba, onlayn platform, Insurtech, ijtimoiy sug'urta, ekologik sug'urta, risklar, integratsiya, investitsiya, islohotlar, strategiya, modernizatsiya.*

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FORMATION AND DEVELOPMENT OF THE INSURANCE MARKET

Abstract: *This article discusses the formation and development of the insurance market in Uzbekistan. It examines the current state of the market, its participants, the regulatory methods employed by the government, a comparative study of the insurance market with foreign experiences, and analyzes the opportunities for the expansion of insurance services. The research employs an analytical approach based on the existing legislative framework, statistical data, and advanced international practices.*

Keywords: *Insurance market, development, financial stability, life insurance, health insurance, property insurance, competition, regulation, prudential norms, digitization, innovations, concentration, demand, foreign experience, online platform, Insurtech, social insurance, environmental insurance, risks, integration, investment, reforms, strategy, modernization.*

Sug'urta bozori — bu sug'urta kompaniyalari, sug'urtalovchilar va sug'urtalanuvchilar o'rtasidagi iqtisodiy munosabatlar tizimi bo'lib, unda sug'urta xizmatlari taklif qilinadi va talab qilinadi. Sug'urta bozori moliyaviy sektorning muhim qismlaridan biri hisoblanib, xavflarni kamaytirish, moliyaviy barqarorlikni

ta’minlash va investitsiyalarni rag‘batlantirish kabi asosiy funksiyalarni bajaradi. Uning asosiy maqsadi - kutilmagan moliyaviy yo‘qotishlarning oldini olish va zararlarni qoplashga yordam berishdir.

Barchamizga ma’lumki, har qanday bozorda sotuvchi va xaridor bo‘ladi hamda ular o‘rtasida tegishli tovarlar (xizmatlar) ayirboshlanadi. Xuddi shunday, sug‘urta bozorida ham sotuvchi (sug‘urtalovchi) va xaridor (potentsial sug‘urtalanuvchi) ishtirok etadi. Bu erda potentsial sug‘urtalanuvchi tushunchasini qanday izohlash mumkin, degan o‘rinli savol tug‘ilishi mumkin. Gap shundaki, basharti, potentsial sug‘urtalanuvchini to‘g‘ridan to‘g‘ri sug‘urtalanuvchi, deb atasak katta xatoga yo‘l qo‘ygan bo‘lamiz. Negaki, amaldagi qonunlarga muvofiq, sug‘urta kompaniyalari bilan bevosita shartnoma tuzgan, fuqarolik salohiyatiga ega bo‘lgan yuridik va jismoniy shaxslarga sug‘urtalanuvchilar deyiladi. Aksincha, sug‘urta “mahsulotini” sotib olishga ehtiyoji bor, ammo hali sug‘urtalovchilar bilan tegishli sug‘urta munosabatlariga kirishmagan shaxslar potentsial sug‘urtalanuvchilar deb ataladi. Endi, sug‘urtalovchilar haqida gapiradigan bo‘lsak, sug‘urtalovchi - bu mamlakat xududida sug‘urta faoliyatini amalga oshirish huquqi berilgan hamda sug‘urtalash o‘zi uchun asosiy faoliyat turi hisoblangan yuridik shaxslardir. Ko‘rinib turibdiki, sug‘urta kompaniyasi tegishli faoliyat yuritishi uchun vakolatli davlat organining litsenziyasiga ega bo‘lishi va sug‘urtaga bog‘liq bo‘lmagan operatsiyalar bilan shug‘ullanmasligi zarur.

Sug‘urta bozori har qanday mamlakat iqtisodiyotining asosiy segmenti hisoblanadi, ayni vaqtda, bevosita uning ravnaqiga ham xizmat qiladi. Shu bilan birgalikda qayd etish lozimki, sug‘urta faoliyati o‘ziga xos tarzda shakllangan va keng qo‘llanilayotgan ijtimoiy hodisa bo‘lib, barqarorlik omili sanaladi. Mamalakat sug‘urta bozori rivojini prognozlash o‘z navbatida, biznes sub'ektlari va aholi manfaatlari himoyasini kafolatli darajada ta’minlash instituti sifatida sug‘urta faoliyatini rivojlantirish yo‘nalishlarini tadqiq etish zaruratini keltirib chiqardi. Bunday nisbat buzilgan holatda bu kompaniyalarga nisbatan davlat iqtisodiy sanktsiyalar qo‘llaydi va ularning ishtirokini ushbu bozorda chegaralab qo‘yadi.

Sug‘urta bozorini davlat tomonidan tartibga solishning elementlaridan biri bozordagi raqobatni sun’iy ravishda yo‘qotish, ya’ni boshqa qatnashchilarni bu bozorga kirishiga yo‘l qo‘ymaslik maqsadida ikki yoki undan ortiq kompaniyalarning o‘zaro til biriktirishi va o‘zaro kelishuvlariga yo‘l qo‘ymaslikdan iboratdir. Raqobatning nosog‘lom usul va vositalari bo‘lmish tariflarni sun’iy ravishda oshirish yoki pasaytirish, sug‘urtalanuvchilarga sug‘urtaning ma’lum bir turi to‘g‘risida yoki ushbu turni amalga oshiruvchi o‘z raqobatchilari to‘g‘risida yolg‘on ma’lumotlar berib, ularni arosatga qo‘yish mumkin bo‘lmagan holatlardir. Bunday holatlarga nisbatan davlat qonunlar va boshqa me’yoriy hujjatlar vositasida doimiy qarshi choralar ko‘rib borishi kerak.

Tadqiqot metodologiyasi

Ushbu ilmiy ishda O‘zbekiston sug‘urta bozorining hozirgi holati, rivojlanish bosqichlari, xorijiy tajriba bilan taqqoslanishi va mavjud muammolarni tahlil qilish asosiy maqsad qilib belgilandi. Mazkur maqsadlarga erishish uchun quyidagi metodologik yondashuvlar tanlandi:

1. Tahliliy metod (Analitik yondashuv)

Ushbu usul yordamida sug‘urta bozorining tarkibi, faoliyat ko‘rsatayotgan kompaniyalar soni, xizmat turlari, raqamli texnologiyalar joriy etilishi, aholi sug‘urtaga bo‘lgan munosabati va soha iqtisodiyotiga ta’siri chuqur o‘rganildi. 2023–2024-yillarga oid statistik ma’lumotlar asosida O‘zbekistondagi sug‘urta kompaniyalari soni va ular o‘rtasidagi raqobat darajasi tahlil qilindi.

2. Taqqoslash (komparativ) usuli

O‘zbekiston sug‘urta bozori **AQSh, Buyuk Britaniya, Germaniya va Yaponiya** sug‘urta tizimlari bilan taqqoslandi. Ushbu usul xorijiy mamlakatlarning ilg‘or tajribalarini aniqlashga, ularni O‘zbekiston sharoitiga moslashtirish imkoniyatlarini baholashga yordam berdi. Taqqoslash orqali, ayniqsa, raqamlashtirish, tartibga solish va xizmat sifati bo‘yicha farqlar ko‘rsatib o‘tildi.

3. Tizimli yondashuv (kompleks tahlil)

Sug‘urta bozorining barcha ishtirokchilari – davlat, kompaniyalar, iste’molchilar, nazorat organlari va ularning o‘zaro aloqasi tizimli asosda ko‘rib chiqildi. Bu yondashuv yordamida bozorning ichki dinamikasi, moliyaviy barqarorlikni ta’minlash mexanizmlari va islohotlarning ta’siri tahlil qilindi.

4. Empirik metod (real faktlarga asoslangan yondashuv)

So‘nggi yillarda sug‘urta bozorida sodir bo‘lgan real o‘zgarishlar, islohotlar va ularning natijalari o‘rganildi. Jumladan, “Yangi O‘zbekiston” taraqqiyot strategiyasi doirasida sug‘urta sohasini raqamlashtirish, axborot xavfsizligini oshirish va fuqarolar sug‘urta madaniyatini yuksaltirishga qaratilgan choralar empirik asosda tahlil qilindi.

5. Me’yoriy-huquqiy tahlil

Sug‘urta sohasini tartibga soluvchi qonunlar, me’yoriy hujjatlar, xalqaro andozalar va ularning O‘zbekiston amaliyotiga tatbiq etilishi o‘rganildi. Bu usul orqali milliy qonunchilikda mavjud bo‘shliqlar va ularni xalqaro standartlarga moslashtirish yo‘llari ko‘rsatib o‘tildi.

O‘zbekiston Respublikasining **“Sug‘urta faoliyati to‘g‘risida”gi Qonuni 2021-yil 23-noyabrda** qabul qilingan[51]. Prezident tomonidan imzolangan ushbu qonun 2021-yil 15-iyunda Oliy Majlis Qonunchilik palatasi tomonidan, 2021-yil 22-avgustda esa Senat tomonidan ma’qullangan. Qonun 10 ta bob va 72 ta moddadan iborat bo‘lib, 2022-yil 25-fevralda kuchga kirgan. Ushbu qonun O‘zbekiston sug‘urta bozorining islohoti va rivojlanishiga qaratilgan asosiy huquqiy hujjat bo‘lib, sug‘urta bozorida ishonchli va barqaror tizim yaratish, raqobatni kuchaytirish hamda xalqaro standartlarga moslashishni maqsad qiladi.

"Sug‘urta faoliyati to‘g‘risida"gi qonun O‘zbekiston sug‘urta bozorining islohoti va modernizatsiyasini ta`’minlashga yo‘naltirilgan. Shuningdek, ushbu qonun, sug‘urta kompaniyalari faoliyatini tartibga solish, bozorda sog‘lom raqobatni yaratish, xalqaro standartlarga moslashish va aholining sug‘urtaga bo‘lgan ishonchini oshirishga xizmat qiladi. Qonun, shu bilan birga, sug‘urta

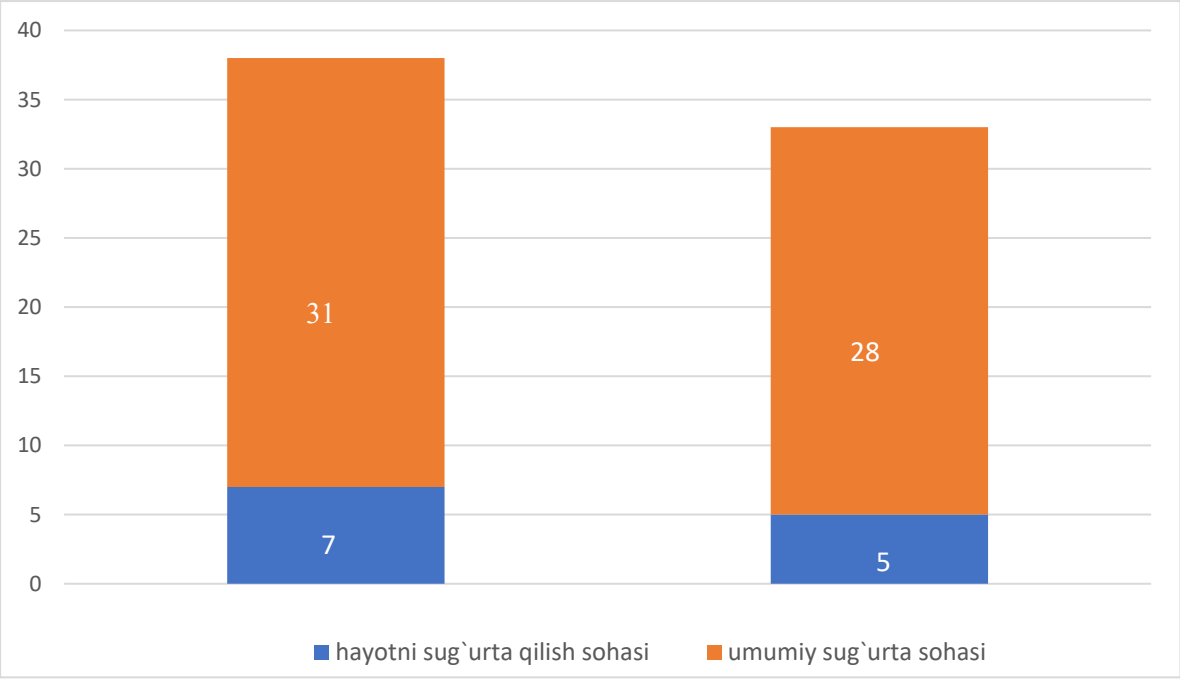
[51] O`zbekiston Respublikasining 23.11.2021-yildagi **“Sug‘urta faoliyati to‘g‘risida”gi qonuni**.

bozorining barqaror ishlashini ta’minlash va iqtisodiyotning boshqa sektorlariga ta’sirini kuchaytirish uchun zaruriy huquqiy asoslarni yaratadi.

Quyida keltirilgan 1-diagrammada 2023-2024-yillardagi sug`urta tashkilotlari soni keltirilgan. 2023-yilda O‘zbekistonda jami 38 ta sug‘urta kompaniyasi faoliyat ko‘rsatgan bo‘lib, ulardan 31 tasi umumiy sug‘urta, 7 tasi esa hayot sug‘urtasi bilan shug‘ullangan. 2024-yilda esa bu ko‘rsatkichlar 5 taga kamayib, 28 ta umumiy sug‘urta va 5 ta hayot sug‘urtasi faoliyatini olib boruvchi kompaniyalar faoliyat yuritgan. Bu o‘zgarish, sug‘urta bozorida raqobat kuchayishi, bozordagi ehtiyojlar va kompaniyalar faoliyatining moslashuvi natijasida yuzaga kelgan bo‘lishi mumkin. Shuningdek, umumiy sug‘urta bo‘yicha faoliyat yuritayotgan kompaniyalar sonining kamayishi, bozorning konsentrasiyalanishini va yirik kompaniyalar kuchining oshishini ko‘rsatadi. Hayot sug‘urtasi bo‘yicha esa, kompaniyalar sonining kamayishi bozorning qisqarishi yoki bu sohada yangi yirik o‘yinchilarning paydo bo‘lishiga ishora qilishi mumkin.

1-diagramma. Sug‘urta tashkilotlarining soni (2023-2024)[52].

Quyidagi jadval ma`lumotlaridan ko`rinib turibdiki, 2023-yilda O‘zbekistonda sug‘urta xizmatlari bo‘yicha umumiy tushum 8 059,7 mlrd so‘mni tashkil etgan bo‘lsa, 2024-yilda bu ko‘rsatkich 9 770,1 mlrd so‘mga yetib, 21,2 foizga o‘sdi. Ushbu o‘sish mamlakatda sug‘urta xizmatlariga bo‘lgan talab ortib



borayotganidan dalolat beradi. Sug‘urta bozorining asosiy qismini umumiy sug‘urta tashkilotlari egallagan bo‘lib, 2023-yilda ular jami hajmning 96 foizini, 2024-yilda esa 97 foizini tashkil etgan. Bu sohada o‘sish sur’ati 22,6 foizni tashkil etdi. Jumladan, umumiy sug‘urtaning majburiy turi 2023-yilda 632,4 mlrd so‘mni tashkil etgan bo‘lsa, 2024-yilda 664,7 mlrd so‘mga yetib, 5,1 foizga oshdi. Ixtiyoriy

[52] NAPP.uz. O`zbekiston Respublikasi istiqbolli loyihalar milliy agentligi.

sug‘urta hajmi esa 7 104,8 mlrd so‘mdan 8 819,0 mlrd so‘mga ko‘tarilib, 24,1 foizlik sezilarli o‘sishni ko‘rsatdi.

Boshqa tomondan, hayotni sug‘urta qilish sohasi pasayish bilan ajralib turdi. 2023-yilda ushbu sohadagi tushum 322,5 mlrd so‘mni tashkil qilgan bo‘lsa, 2024-yilda u 286,4 mlrd so‘mga tushib, 11,2 foizga kamaydi. Biroq majburiy hayot sug‘urtasi bo‘yicha tushum 35,6 mlrd so‘mdan 48,1 mlrd so‘mga ko‘tarilib, 35,1 foizga o‘sdi. Aksincha, ixtiyoriy hayot sug‘urtasi hajmi 286,8 mlrd so‘mdan 238,2 mlrd so‘mga kamayib, 17 foizlik salbiy o‘zgarishni ko‘rsatdi. Bu esa ushbu yo‘nalishda xizmatlar sifati, aholining ishonchi yoki talab darajasida muayyan muammolar borligidan darak beradi.

1-Jadval

Ko`rsatkichlar	2023-yil		2024-yil		O`zgarish %
	mln.so`mda	Jamiga nisbatan %da	mln.so`mda	Jamiga nisbatan %da	
Jami	8 059 726	100%	9 770 107	100%	+21.2%
Umumiy sug`urta sohasidagi sug`urta tashkilotlari, shu jumladan,	7 737 236	96%	9 483 746	97%	+22.6%
-majburiy sug`urta** **-ixtiyoriy sug`urta	632 427 7 104 809	8% 88%	664 719 8 819 027	7% 90%	+5.1% +24.1%
Hayotni sug`urta qilish sohasidagi sug`urta tashkilotlari, shu jumladan,	322 491	4%	286 362	3%	-11.2%
-majburiy sug`urta** **-ixtiyoriy sug`urta	35 645 286 846	0% 4%	48 162 238 199	0% 2%	+35.1% -17.0%

1-jadval. Umumiy sug`urta mukofotlari[53]

Xorijiy davlatlar tajribasi shuni ko‘rsatadiki, sug‘urta bozorining barqaror va samarali faoliyat yuritishi uchun davlat tomonidan aniq tartibga solish, majburiy va ixtiyoriy sug‘urtalarning uyg‘unligi, aholiga soliq va huquqiy rag‘batlar yaratish, shuningdek raqamli texnologiyalarni joriy qilish muhim ahamiyatga ega.

AQSh, Germaniya va Buyuk Britaniya kabi ilg‘or mamlakatlar misolida sug‘urta xizmatlarining xilma-xilligi, yuksak raqobat muhiti, mijozlarga qulaylik yaratish, sug‘urta madaniyatining shakllanganligi kuzatiladi. O‘zbekistonda esa sug‘urta sektori hali rivojlanish bosqichida bo‘lib, xorijiy tajribalarni moslashtirib, quyidagi yo‘nalishlarda ishlash zarur:

- sug‘urta xizmatlarini kengaytirish (sog‘liq, ijtimoiy, ekologik),
- aholi o‘rtasida sug‘urta madaniyatini shakllantirish,
- soliq imtiyozlari va davlat kafolatlari orqali ishonchni oshirish,

[53] NAPP.uz. O`zbekiston Respublikasi istiqbolli loyihalar milliy agentligi.

- raqamli texnologiyalarni joriy qilishni jadallashtirish.

Shunday ekan, xorij tajribasi asosida O‘zbekiston sug‘urta bozorini isloh qilish, zamonaviylashtirish va aholining faol ishtirokini ta``minlash orqali ushbu sohani iqtisodiyotning barqaror tayanch ustunlaridan biriga aylantirish mumkin.

Xulosa qilib aytganda, sug‘urta bozori har qanday rivojlangan yoki rivojlanayotgan iqtisodiyotda xavflarni boshqarish, moliyaviy barqarorlikni ta``minlash, fuqarolar va korxonalarning iqtisodiy manfaatlarini himoya qilishda muhim vosita sifatida e’tirof etiladi. Shu bilan birga, sug‘urta bozorining to‘laqonli shakllanishi va rivojlanishi O‘zbekistonda moliyaviy xizmatlar sohasini kengaytirish, aholining iqtisodiy barqarorligini mustahkamlash va milliy iqtisodiyotning xavfsizligini ta’minlashda asosiy omillardan biriga aylanishi mumkin.

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THE IMPORTANCE OF THE SUBJECT OF GEOGRAPHY IN DEVELOPING ECOLOGICAL KNOWLEDGE IN PUPILS

Summary: *Due to the drying up of the Aral Sea, the ecological disaster on the territory of the Republic of Karakalpakstan has aggravated and led to negative changes in the environment, and significantly affected all sectors of the economy. This article considers the role of geography in the formation of environmental education and skills in schoolchildren of Karakalpakstan.*

Key words: *Ecological culture, ecological crisis, natural complex, natural resources, rational use, mineral resources, human factor, labour resources, agriculture, reserve, seminar, conference.*

Introduction. Today, the rapid changes occurring in the environment as a result of technological progress do not allow people to devote enough time to thinking. As the world's population grows, so does its need for consumer goods, food and drinking water. This, in turn, gives rise to such problems as the inappropriate use of natural resources and the indecent attitude of modern industry towards the environment. In order to protect our Planet's air, soil and water resources, ensure its safety and stabilize environmental problems, it is necessary to educate environmentally friendly generations.

In connection with deterioration of the ecological situation caused by drying up of the Aral Sea, such tasks as improvement of ecological education of preschoolers and schoolchildren, and formation of ecological culture of the indigenous population have become actual tasks of the society today.

In his speech at session 72 of UN held on 19 September, 2017 president Sh. M. Mirziyoyev said, “Once again, I’d like to draw your attention to the Aral Sea crisis, one of the most urgent problems of today. Here is the map of the Aral Sea catastrophe in my hands. I think that it does not need any explanation. Solving the problems, caused by the drying up of the sea, requires combining appropriate international actions. We support the programme on practical aid to people suffering from Aral Sea disaster approved by UN” [1]

Results. According to the requirements of the new education program implemented in the system of education, the contents of each subject of secondary school are being rewritten in accordance with the demands of local social life and ecology, and new textbooks are being created.

The use of new modern techniques and methods which enliven the ecological topics and pupils’ yearning for knowledge means creating a new complex, which

renovates old methods in education and comprises methodological and pedagogical ideas defining the main directions of school's future.

Creating a favourable attitude towards ecology in adolescents is a complex social and pedagogical process. Since the residents of our region live in an area of deteriorated environmental conditions, the subject of Geography plays a big role in improving their environmental culture. Geography has greater potential than other subjects in teaching the basis of ecology and effectively achieving its goals.

For the sake of the safety and future of the planet, instilling in the younger generation the love for the environment and developing their knowledge about the environment is entrusted to experienced teachers.

Along with enriching environmental knowledge, much attention should be paid to developing its educational function and compiling textbooks necessary for every person to receive environmental education.

Developing students' environmental consciousness is not only about teaching the basics of ecology, but also about instilling problem-solving skills in students so that they can feel the need to understand environmental problems, compensate for damage caused to nature, and prevent future damage. In addition to conducting lessons and expanding the interests of schoolchildren, it is also important to direct their will, character, and worldview to nature conservation activities [2].

The Course of Natural Geography provides valuable information about the interaction of the Earth and its geographical layers, the laws of their development, the relationship between society and man, and the interrelated development of the components of nature in the environment. The topics of the course such as Atmosphere, Lithosphere, Hydrosphere, Biosphere, as well as the topics on the contamination of the environment and ecological problems explain the importance of the geographic crust for human life and play a significant cognitive role in developing students' ecological outlook.

In the process of learning the natural geography of continents and oceans, great attention is paid to the topics of interrelated development of soil, vegetation, and the wildlife as well as to the topic of protection of the nature. In the course of these topics, students contemplate and gather information on the ecological problems occurring in natural zones of all continents, on the measures taken to protect the nature, natural parks and reserves and develop their ecological thinking abilities.

In developing the skills of protecting the environment and natural resources in students, first, we should lay the foundations of ecological knowledge in them. Secondly, in order to create in them new ideas about environment, we should explain the importance of the nature and the ways of protecting it with the help of reports on natural disasters, opinions and conclusions of experts.

To educate comprehensively developed and ecologically literate citizens, the teacher should possess all valuable sources of information about the region where he lives. Nowadays, the importance of learning the territorial location of the mineral resources developed by manufacturing forces of society and their territorial organization is becoming urgent.

Some young people's knowledge is limited to natural resources and mineral production. They do not pay sufficient attention to the impact of human activities on the natural complexes where they live, and do not have exact data on the measures taken in our country to protect the environment.

Therefore, teaching geography requires studying not only the relationship between nature and society, but also studying the human factors influencing both of them. For example, in the course “Economic and Social Geography of Uzbekistan”, we should not limit ourselves to studying the human factor only as a labor resource, but should also carefully study its connection with natural, economic and social problems.

Studying the natural geography of Karakalpakstan, we must deeply analyze the state of the natural components of our country in modern environmentally stressed conditions. People should know that disruption of nature and its balance has an impact on human activity and life. This attitude will teach people to take care about nature as if they were their own eyes, and to treat nature correctly.

One of the most important tasks in the process of studying the economic and social geography of Karakalpakstan is to instill in students the knowledge about the territorial structure of the areas, where the population live as well as the issues of rational development and consumption of its natural resources in accordance with scientific methods for the benefit of people.

In studying the Economic and Social Geography of the World students acquaint themselves with the pollution of environment in different parts of the world and the root causes of ecological problems. They also study the effective ways of solving them. Also, they get to know how the Aral Sea ecological disaster, caused by drying up of the Aral Sea, affects negatively the social and economic development of the population and, of course, the work force. This arouses in them the love for the nature and understanding of the need to use the natural resources efficiently as well as the importance of every individual’s efforts in dealing with the problems.

Currently, more than 2.7 thousand large nature reserves and natural parks have been created around the world. Most of them are located in developed countries, that is, in the USA, Germany, Canada, Japan, Australia [3]. Interesting stories and demonstrative lessons of the teacher about the attitude of the population of these countries to the environment, their culture, their activities aimed at not killing animals for no reason and preserving vegetation, pastures, water bodies and forests help create the opportunity to develop an environmental culture in students.

Students’ creative works are also of great didactic importance, for example, their environmental posters, drawings, brochures, newspapers, thematic projects aimed at increasing environmental literacy, essays on environmental topics force teenagers to compare different sources of information, analyze and express their own opinions about the rational consumption of nature and natural resources [4].

Conclusion. In order for the educational side of a geography lesson to be more effective, the expression of opinions, discussions, decision-making and other activities between the teacher and students should be carried out on an equal and

open basis. Discussion classes, seminars, conference and debate classes can be conducted appropriately this way. Disputes or seminars on the ecological problems of our country can also be organized. For example,1) How the ecological conditions caused by drying up of the Aral Sea affect the health and life of the Republic's population. 2) Of what steps taken to keep the ecological balance in the region, affected by the Aral Sea, consist of. 3) What kind of projects are carried out in order to provide the population of the region with healthy foods. 4) What measures and decisions should be put into practice in order to form healthy lifestyle in the people and so on.

In these activities the teacher directs the thoughts of students to the solution of today's real problems, and completely convinces them that everyone should participate in tackling these issues. The aim of present geography education is, along with developing and enlarging the scope of knowledge of students, to bring up ecologically cultured citizens, who can freely think about the ecological views of each nation living on the earth, think geographically and evaluate situations accordingly.

If we appropriately incorporate environmental education into lessons when teaching geography in school, we can create opportunities for students to develop the following environmental and educational responsibilities.

- The ability to understand the relationship between man and society and their impact on people's activities and lives;
- Ability to analyze sources of water, air and soil pollution and know ways to prevent them;
- Awaken love and devotion to their homeland, to the nature of their own region;
- Know how to effectively consume the country's natural resources, their careful handling and conservation;
- Look for possible ways to save flora and fauna that are in danger of extinction due to environmental disaster;
- To form an environmental culture among students by expanding their geographical horizons;

If we successfully resolve, with the assistance of the general public, these pressing issues that lay the foundations for the ecological culture of the youth, we will be able to educate a geographically literate, ecologically qualified future generation and make a significant contribution to the stabilization of the ongoing environmental disaster in our Republic.

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ISSUES OF PERIODIZATION AND CLASSIFICATION OF HISTORICAL AND ARCHITECTURAL OBJECTS

Abstract: *This article addresses the issues of periodization and classification of historical and architectural objects. Architectural monuments are analyzed as objects reflecting the characteristics of their era and the aesthetic value of cultural heritage. The study highlights the principles of dividing objects into periods, their regional and functional differences, and the theoretical and practical aspects of classification in a historical-cultural context. This article focuses on pressing issues in the preservation and scientific study of historical monuments.*

Keywords: *Historical and architectural objects, periodization, classification, cultural heritage, architectural features, historical context, preservation and conservation.*

Introduction

In the years since uzbekistan's independence, the country has taken significant steps to preserve and explore its rich historical and cultural legacy. One of the key areas receiving increased attention is the study of national history, particularly the deep analysis of historical and architectural monuments. This focus not only fosters national pride among the younger generation but also allows them to draw meaningful lessons from the experiences and achievements of their ancestors.

History, as a discipline, encompasses the chronological development of human society, analyzing events within their specific timeframes and contexts. It seeks to understand the evolution of human civilizations and the socio-political, cultural, and economic transformations that have occurred over time. In this regard, uzbekistan's history forms an inseparable part of world history. Its architectural and cultural monuments reflect a continuous dialogue between civilizations and have made significant contributions to global heritage. Studying the lives and achievements of ancient peoples on this land—who developed urban planning, religious architecture, scientific thought, and trade—helps illuminate how uzbekistan has shaped and been shaped by broader historical processes.

Literature review and methodology

Historical and architectural objects are invaluable in understanding the trajectory of human civilization. These monuments serve not only as physical remnants of the past but also as carriers of intangible values such as belief systems, artistic trends, technological advancements, and societal organization. They are primary sources that reveal the spiritual and material life of ancient peoples.

To ensure proper scientific understanding and preservation of such objects, two critical processes are employed: periodization and classification.

Periodization

Periodization involves dividing historical-architectural objects into specific historical epochs based on their origin and stylistic characteristics. It provides a temporal framework that helps researchers contextualize and interpret the significance of the monument. Four main methodologies are typically applied:

Archaeological findings – excavated artifacts such as ceramics, tools, architectural fragments, coins, and burial remains allow scholars to approximate construction dates and cultural layers.

Epigraphic sources – inscriptions in stone, brick, or wood help identify key events, rulers, religious dedications, or construction patrons, allowing for precise historical dating.

Architectural style and construction techniques – elements such as domes, arches, portals, columns, and ornamentation provide clues about the time period and regional stylistic influences.

Scientific dating methods (e.g., radiocarbon analysis) – these offer an empirical basis for dating organic components (wood, charcoal, mortar), enabling more accurate chronological frameworks.

Classification

Classification is the process of categorizing architectural objects according to their function, form, cultural significance, and construction methods. A well-structured classification allows for comparative research and practical efforts in conservation and restoration. The main types include:

Religious structures

Mosques, churches, temples: centers of worship representing islam, christianity, buddhism, and other religions.

Mausoleums, shrines: memorials or sacred sites dedicated to religious leaders, saints, and prominent figures.

Civil architecture

Palaces and mansions: residences of rulers and nobility that reflect power, governance, and societal hierarchy.

Fortresses and citadels: defensive structures that embody the military engineering and strategic planning of their time.

Trade and industrial buildings

Caravanserais and bazaars: hubs of regional and transcontinental trade, illustrating the economic prosperity and international connections.

Workshops, kilns, production centers: sites of craft and technological innovation.

Educational and cultural institutions

Madrasahs, libraries: centers of religious and secular learning, promoting intellectual development.

Amphitheaters, museums, theaters: spaces for artistic expression, public gatherings, and cultural continuity.

This systematization helps document and analyze objects in a structured manner while also guiding conservation policies.

Results

The accurate periodization and classification of historical-architectural objects create the foundation for deeper interdisciplinary studies. These processes contribute to several vital aspects: historical analysis: by situating monuments within their appropriate historical contexts, scholars can explore social structures, ideological shifts, and urban evolution. Preservation planning: categorization assists in prioritizing restoration work and applying appropriate methods for various types of monuments. Educational and cultural engagement: classifying and periodizing historical sites helps in designing museum exhibits, curricula, and heritage tourism programs. Each historical epoch carries unique economic, spiritual, and cultural characteristics. These attributes are reflected in the design, construction, and symbolic meaning of architectural monuments. By interpreting these features correctly, historians can assess the values and worldviews of the time.

Over the centuries, different calendar systems were used by civilizations, and determining accurate chronologies often involves reconciling these diverse frameworks. In some cases, the exact dating of monuments remains contested, demanding interdisciplinary approaches.

Classical and modern historians have long debated how to divide history into periods. While the traditional marxist-leninist model defined five socio-economic formations (primitive communism, slavery, feudalism, capitalism, and socialism), such a rigid framework fails to accommodate regional variations and non-linear developments in different parts of the world.

Thus, there is growing support for models that take into account the regional socio-economic peculiarities and historical continuity specific to each culture or area. For example, the early communal lifestyle lasted longer in central asia than in parts of western europe, and the islamic middle ages showed different dynamics than european feudalism.

Discussion

Scholars from the mid-19th century onwards sought to systematize history according to dominant modes of production and ownership. While such models provided a macro view of social development, their limitations became increasingly apparent. Historical processes are neither uniform nor predictable; they are shaped by cultural, environmental, technological, and ideological factors that differ across regions.

Therefore, a more pluralistic and flexible approach to periodization is necessary. This approach must:

Be grounded in empirical data from local historical contexts;

Recognize unique regional features rather than enforce universal schemes;

Integrate archaeological, written, and architectural sources;

Be adaptable to educational and conservation needs.

In both scholarly research and secondary education, this nuanced method offers a more authentic understanding of history and promotes respect for diverse civilizations.

Conclusion

The systematic periodization and classification of historical-architectural objects are crucial for:

Scientific research – enabling organized, comparative, and interdisciplinary study of the built environment.

Cultural heritage preservation – assisting in planning conservation projects, ensuring authenticity, and maintaining architectural integrity.

Educational and cultural promotion – enriching public understanding through museums, educational content, and tourism initiatives.

In sum, a scientifically grounded approach to categorizing historical and architectural heritage ensures not only the preservation of cultural memory but also the responsible transmission of this legacy to future generations. The theoretical and practical models discussed in this study may serve as foundational tools for future academic, institutional, and governmental efforts in cultural heritage management.

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GEOECOLOGICAL ANALYSIS OF GROUNDWATER TABLE AND LAND RESOURCES IN THE FERGANA REGION
FARG‘ONA VILOYATINING SIZOT SUVLAR SATHI VA YER FONDINING GEOEKOLOGIK TAHLILI

Annotatsiya. *Ushbu maqolada Farg‘ona viloyatining 2024 yil 1-oktyabr holatiga tayyorlangan sizot suvlar sathi xaritasi asosida yer resurslarining geoekologik holati chuqur tahlil qilindi. Tadqiqot davomida sizot suvlarining chuqurligi, ularning taqsimlanishi, qishloq xo‘jaligiga ta’siri, degradatsiya xavfi va ekologik barqarorlik holati ilmiy asosda baholandi. Meliorativ chora-tadbirlar, tuproq sho‘rlanishi va yer fondining samarali boshqaruvi bo‘yicha amaliy takliflar ishlab chiqildi.*

Kalit so‘zlar: *Sizot suvlar sathi, yer resurslari, geoekologik holat, melioratsiya, sho‘rlanish, Farg‘ona viloyati, tuproq degradatsiyasi.*

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GEOECOLOGICAL ANALYSIS OF GROUNDWATER TABLE AND LAND RESOURCES IN THE FERGANA REGION

Annotation. *In this article, the geoecological condition of land resources in the Fergana region is thoroughly analyzed based on the groundwater table map as of October 1, 2024. During the study, the depth and distribution of groundwater, its impact on agriculture, degradation risk, and ecological sustainability were scientifically assessed. Practical recommendations were developed regarding reclamation measures, soil salinization, and the effective management of land resources.*

Key words: *Groundwater table, land resources, geoecological condition, land reclamation, soil salinization, Fergana region, soil degradation.*

Kirish. Farg‘ona vodiysi O‘zbekiston Respublikasining eng zich aholiga ega, iqlimi qulay, suv va yer resurslariga boy hududi sifatida tanilgan. Ushbu hudud agrar-iqtisodiy rivojlanish nuqtai nazaridan katta salohiyatga ega bo‘lib, mamlakatning umumiy qishloq xo‘jaligi mahsulotlarining sezilarli qismini yetishtiradi. Ammo bu resurslardan oqilona foydalanmaslik, tabiiy-geografik omillar va inson faoliyatining keskin ta’siri natijasida ekologik muammolar

kuchayib bormoqda. Ushbu muammolarning markazida sizot suvlarining yuqori sathda joylashuvi turadi. Yer sathiga yaqin joylashgan sizot suvlar tuproq sho‘rlanishi, qayta namlanish, biologik faoliyatning pasayishi, hosildorlikning kamayishi va natijada tuproq degradatsiyasiga olib keladi. Bu holat esa qishloq xo‘jaligi ishlab chiqarishiga salbiy ta’sir ko‘rsatadi, ijtimoiy-iqtisodiy barqarorlikni izdan chiqaradi va ekologik xavfsizlikka tahdid tug‘diradi.

Bugungi kunda global miqyosda ekologik xavfsizlik va yer resurslarining barqaror boshqaruvi muhim strategik yo‘nalish hisoblanmoqda. O‘zbekiston hukumati tomonidan 2030-yilgacha mo‘ljallangan milliy taraqqiyot strategiyasi doirasida yer resurslaridan oqilona foydalanish, suv ta’minotini barqarorlashtirish va melioratsiya tizimlarini modernizatsiya qilish kabi muhim vazifalar belgilab qo‘yilgan. Shuningdek, xalqaro ekologik me’yorlarga asoslangan monitoring tizimlarini joriy etish va GIS texnologiyalaridan foydalanish orqali yer va suv resurslari holatini tahlil qilish dolzarb masalaga aylangan.

Mazkur maqolada 2024 yil 1-oktyabr holatida tayyorlangan Farg‘ona viloyatining sizot suvlar sathi xaritasi asosida hududiy tahlil olib boriladi. Tadqiqotning asosiy maqsadi – sizot suvlarining taqsimlanishi, ularning yer fondiga, ayniqsa qishloq xo‘jaligiga salbiy ta’sirini baholash, mavjud geoekologik xavflarni aniqlash va ularni bartaraf etish bo‘yicha amaliy tavsiyalar ishlab chiqishdan iborat.

Farg'ona viloyati tumanlarida 2024 yil 1-oktyabr holatiga sizot suvlar sathi joylashuv XARITASI

Tadqiqotlar tarixidan. Sizot suvlarining yer resurslariga ta’siri bo‘yicha ilmiy izlanishlar XX asrning ikkinchi yarmidan boshlab faol olib borilgan. Dastlabki tadqiqotlar asosan sug‘oriladigan hududlarda tuproq sho‘rlanishi va eroziya muammolariga qaratilgan bo‘lsa, so‘nggi yillarda bu muammo ekologik xavfsizlik va barqaror taraqqiyot nuqtai nazaridan ham chuqurroq o‘rganilmoqda. O‘zbekiston bo‘yicha akademik Sh. R. Saidov, professor T. Qodirov, V. N. Drobov va boshqa mutaxassislar tomonidan yer resurslari, melioratsiya va suv balansining tuproq holatiga ta’siri o‘rganilgan. Farg‘ona vodiysi bo‘yicha o‘tkazilgan izlanishlar shuni ko‘rsatadiki, bu hududda sizot suvlarining notekis taqsimlanishi,

yerdan foydalanishda keskin tafovutlar mavjud. Ayniqsa, viloyatning janubiy qismi yuqori sizot suv sathiga ega bo‘lib, qishloq xo‘jaligi uchun xavf tug‘diradi.

Material va metodlar. Ushbu ilmiy izlanishda asosiy tahlil manbasi sifatida 2024 yil 1-oktyabr holatiga tayyorlangan "Farg‘ona viloyati tumanlarida sizot suvlar sathi xaritasi" olindi. Xaritada viloyatning barcha tumanlaridagi sizot suvlar sathi 6 toifaga bo‘lingan: 0–1 m, 1–2 m, 2–3 m, 3–5 m, 5–10 m va 10 m dan chuqur. Bu zonalar mos ravishda qizil, pushti, sariq, yashil, moviy va to‘q ko‘k ranglar bilan belgilangan.

Tahlilda quyidagi metodlar qo‘llanildi:

- Kartografik va statistik tahlil;
- GIS texnologiyalari asosida zonal taqsimot;
- Tuproq-iqlim xaritalari bilan solishtirish;
- Degradatsiya va sho‘rlanish xavfi darajalarining hisob-kitobi;
- Monitoring va diagnostika usullari.

Shuningdek, O‘zbekiston Respublikasi Ekologiya qo‘mitasi, viloyat yer tuzish boshqarmasi va Fanlar akademiyasi materiallaridan foydalanildi.

Farg’ona viloyatining 2024-yil 1-oktabr holatidagi sizot suvlar sathi haqidagi statistik ma’lumotlar

№	Tumanlar nomi	Sug'oriladigan maydon	Shu jumladan SSS bo'yicha m,					
			0 -1,0	1,0-1,5	1,5-2,0	2,0-3,0	3,0-5,0	5,0-10
	Viloyat bo'yicha	368705	156	5090	121347	134340	24831	82941
1	Quvasoy	15155		28	46	428	1612	13041
2	Beshariq	31758		630	17239	8606	5283	
3	Bog'dod	25910		195	9149	10382	1166	5018
4	Buvayda	20986		87	3616	17063	220	
5	Dang'ara	27213	61	746	17690	7678	1038	
6	Yozyovon	22512		160	6361	15991		
7	Quva	26247		2102	6408	6286	4057	7394
8	Oltiariq	23908	5	94	13153	8156	2500	
9	Qo'shtepa	27982		114	6289	21184	395	
10	Rishton	25295		44	9044	9816	1129	5262
11	Toshloq	18812		54	1032	15230	2478	18
12	O'zbekiston	25785	14	146	8477	2569	1033	13546
13	Uchko'prik	20962	63	123	6368	7667	2361	4380
14	Farg'ona	29565		267	771	1284	1353	25890
15	Furqat	17818		275	15639	1844	60	
16	Farg'ona sh.	3837	13	25	65	156	146	3432
17	So'x	4960						4960
	Jami:	368705	156	5090	121347	134340	24831	82941

Natijalar va muhokama. Tahlil natijalari shuni ko‘rsatadiki, viloyat bo‘yicha sizot suvlarining sathi juda notekis taqsimlangan. Eng xavfli hududlar, ya’ni sizot suvlari 0–2 metr chuqurlikda joylashgan zonalar umumiy yer maydonining 35–40 foizini tashkil etadi. Ushbu zonalarda ko‘proq sho‘rlanishga uchragan tuproqlar, suvning yer sathiga yaqinligi sababli qayta namlangan joylar va yer resurslarining samaradorligi pasaygan. Ayniqsa, Qo‘shtepa, Dang‘ara, Rishton, Buvayda va Uchko‘prik tumanlarida ushbu holat kuzatiladi. Sizot suvlarining sathi chuqurlashtikani sari (3–5 m va undan chuqur), dehqonchilik salohiyati ortadi. Yashil va ko‘k zonalarda hosildorlik yuqori, sho‘rlanish darajasi esa minimal. Ushbu zonalarda ilg‘or agrotizimlar tatbiq etilishi orqali yer unumdorligini oshirish mumkin.

Tahlillar shuni ko‘rsatdiki, mavjud drenaj tizimlari asosan shimoliy va markaziy hududlarda qisman faol ishlamoqda, biroq janubiy zonalarda ular mavjud

emas yoki yaroqsiz holatda. Bu esa sho‘rlanish, eroziya va tuproq sifati yomonlashuviga sabab bo‘lmoqda. Bundan tashqari, ayrim zonalarda suv chiqmasi past bo‘lganligi sababli suv to‘planib qoladi va bu esa ekologik xavfni kuchaytiradi.Yer fondining ishlatilish shakllari ham ushbu xarita orqali aniq ko‘rish mumkin. Sug‘oriladigan maydonlar asosan 2–5 m chuqurlikda joylashgan. 0–2 m chuqurlikdagi maydonlarda esa chorvachilik, o‘tloqzorlar yoki foydalanilmayotgan yerlar mavjud. Shuningdek, bu hududlarda aholining turar-joylari atrofida sanitar-epidemiologik xavflar ortib bormoqda.

Xulosa. Tadqiqotlar natijasi shuni ko‘rsatdiki, Farg‘ona viloyatida sizot suvlarining yuqori sathi yer resurslaridan foydalanishda muhim cheklov omil hisoblanadi. Tuproq sho‘rlanishi, eroziya, qayta namlanish va boshqa ekologik muammolar yuqori bo‘lgan zonalarda meliorativ tadbirlarni kuchaytirish zarur.

Quyidagi tavsiyalar ilgari suriladi:

1. Xavfli zonalarda (0–2 m) drenaj tizimlarini qayta tiklash va modernizatsiya qilish;
2. Sug‘oriladigan maydonlarda sho‘rlanishga chidamli ekin turlarini joriy etish;
3. Yer monitoringi tizimini raqamlashtirish va GIS orqali nazoratni kuchaytirish;
4. Har bir tuman uchun alohida ekologik rejalashtirish siyosatini ishlab chiqish;
5. Aholi yashaydigan hududlarda sizot suvlariga qarshi drenaj tizimlari bilan birga ekologik ta’limni rivojlantirish.

Farg‘ona viloyatining agrar salohiyati yuqori bo‘lsa-da, tabiiy-geografik va gidrogeologik sharoitlar uni ehtiyotkorlik bilan boshqarishni talab etadi.

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SOILS OF KARNOBCHUL LANDSCAPES

Abstract: *This article studies the soil composition, mechanical properties and agrochemical status of the Karnabchul landscapes. The study analyzes the climatic conditions of the Karnabchul region, soil types (light gray, gray-brown, gray-brown) and their indicators such as density, salinity, humus content, water permeability. The vegetation cover of this region, in particular the composition of wormwood-ephemeral plant groups and the factors affecting them, are also highlighted.*

Keywords : *Karnobchul, landscape, gray soils, gray-brown soils, gray-brown soils, salinity, humus, water permeability, mechanical composition, plant cover, wormwood-ephemeral, desert flora, climate change, pasture degradation, agrochemical status, ecological monitoring, livestock resources.*

Introduction In recent years, in the desert and semi-desert regions of Uzbekistan, ecological problems have been deepening due to climate change, anthropogenic pressure, and improper pasture use. In particular, the degradation of pastures and natural landscapes, the decrease in soil fertility, and the loss of biodiversity have made maintaining ecological stability in desert regions an urgent issue. In arid regions such as Karnabchul, rational use of natural resources, in-depth study of the characteristics of soil and vegetation cover, and the development of mechanisms for their use are important for ecological and economic stability. This article analyzes the soil types of Karnabchul landscapes, their physicochemical properties, and the composition of vegetation cover, as well as the factors affecting them. Climate change and the expansion of anthropogenic impact around the world are leading to the degradation of existing landscapes and pastures and a sharp reduction in pasture areas. As a result, the need for research aimed at preserving existing landscapes and pastures has increased, and this type of research has become necessary.

Relevance : Globally, the degradation of desert and semi-desert areas, the decline in pasture productivity, and the depletion of biological resources threaten ecological security. In particular, in desert areas that occupy a large part of Uzbekistan, including Karnobchul, effective management of land resources and the development of a soil-agrochemical monitoring system have become a necessity. The lack of comprehensive information on soil properties and vegetation cover of these areas is one of the significant obstacles to ecological planning. Therefore, this study is relevant not only scientifically, but also practically, and it serves to preserve and sustainably manage Karnobchul landscapes.

Main part: Landscapes and the pastures in them are important natural resources. If natural resources are used wisely, they can regenerate themselves. Humanity has used deserts and steppe pastures since ancient times, has known how to preserve them, and has managed to do so to this day. People were well aware that caring for the land, including natural landscapes and pastures, was a source of their well-being [3].

Over the past 50 years, the vegetation crisis in the desert has intensified[4]. In addition, droughts and reduced atmospheric precipitation due to climate change have begun to seriously damage the flora of the pastures. In the pastures of Uzbekistan, where there are 1,700 species of plants, today 200 species have completely disappeared, and some have declined significantly [5].

Karnabchul is located in the southern part of the Zirabulak Mountains on the left bank of the Zarafshan River, occupying lands 310 m above sea level. In the literature, this area is referred to as the “Карнабская степь”. According to its climatic characteristics, Karnabchul is typical of the Mediterranean climate type, the relief of Karnabchul is generally sloping from east to west and flat, and only in the northern part, that is, the mountain slopes are low and high, wavy , and divided by numerous streams and temporary waterways.

According to climatic indicators, Karnobchul, like all Central Asian deserts, is characterized by aridity and sharply continentality. The average annual temperature is 17.1 °C . The hottest air temperature is observed in June-July, when in the shade this indicator is +40+47 °C . The coldest air temperature is observed in December-February, sometimes it is 20-30 °C . The average annual relative humidity is 30%, and in summer this indicator often does not exceed 10-20%. The main part of the precipitation falls on the months of November-April . The average annual precipitation varies from 81.9-297.4 mm, the average annual indicator is 162.0 mm.

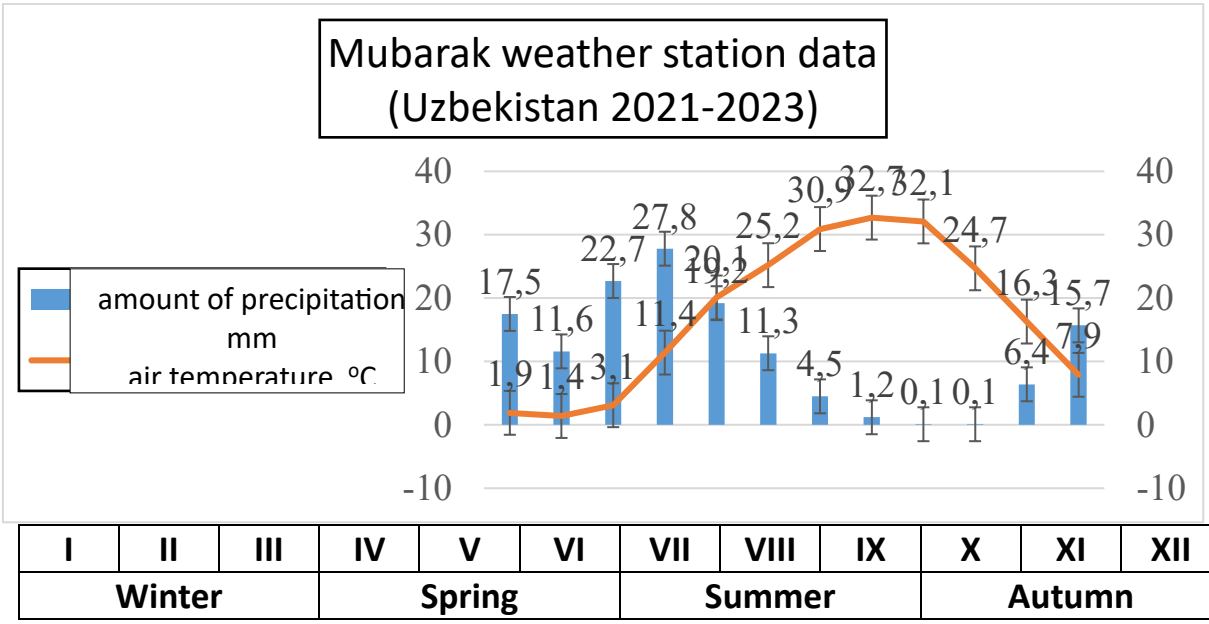

Figure 1. Climate diagram of the study area (data from the Mubarak weather station (Uzbekistan), 2021-2023).

The soils of Karnobchul are light gray soils. In the zone of light gray soils, an average of 200-300 mm of precipitation falls per year. The saline salts in the upper layer of the soil are not washed out well, at a certain depth, about 40-60 cm, sometimes even 1-2 m below, a saline layer is found. Light gray soils are poor in organic matter according to their mechanical composition compared to soils of other regions . The humus layer contains 0.5 to 1.5 percent. Light gray soils account for 10 percent of the total fertile land (supplied fertile land) in the region and 18 percent of the total irrigated area (supplied fertile land). Newly irrigated land areas (Mirzachul, Jizzakh, Karshi) The vast majority of the deserts consist of light gray soils. Light gray soils have poor granularity. However, they are characterized by high permeability and high capillarity. Therefore, on slightly sloping lands, light gray soils are desalinated as a result of leaching, but on flat terrain, due to excessive irrigation and other factors, saline groundwater rises to the surface of the soil, causing re-salinity. This situation requires digging collector ditches, leaching soil salts, strictly regulating the irrigation regime of crops, leveling the land, introducing crop rotation, establishing hedges, and other measures to reduce the level of groundwater. Soils in the gray soil region have a low content of humus, nitrogen, and phosphorus, and organic matter quickly mineralizes. The soil structure is not very strong. But the natural fertility of the soils of this region is significantly higher than that of the soils of the flat desert region.

Since gray-brown soils are formed from parent rocks of different compositions, their mechanical composition is also different, with sandy and light loamy types being more common. These soils often have jagged gravel on their surface. The upper layers of the soil are characterized by a large content (11-18%) of fine sand and large dust fractions, and in the illuvial horizon - silt particles smaller

than 0.001 mm. The bulk of Karnobchul soils consists of light gray-brown soils. The gypsum salinity in these soils is quite high (at a depth of 50-60 cm), and the humus content is also quite high, about 1.17%. The main part of carbonates lies at a depth of 10-20 cm, and their amount decreases with depth. The mechanical composition of gray-brown and gray-brown soils is distinguished by its diversity. In terms of mechanical composition, Karnobchul is divided into the following types: loamy-sod soils of light gray-brown color, saline soils with deluvial-proluvial layers, gypsum-loamy light gray-brown soils, etc. All types of soils are characterized by layer-by-layer arrangement in terms of density, mechanical composition and salt content. The light silt layer alternates with medium silt, loam and other layers. In some layers, the amount of silt with a size of 0.001 mm reaches 21%.

The water-physical and agrochemical properties of gray-brown soils are quite unfavorable, due to the large and close location of gypsum in the soil and parent rocks, the complexity of the relief, etc., the development of these soils is quite difficult. The specific gravity and density of soil particles varies from 1.72 to 1.37 g/cm ^{3} , which indicates their different origin. The difference between them is expressed only in the ratio of rock fragments to small soil particles and the degree of cementation. The density of the overburden layer is 1.45-1.50 g/cm ^{3} , the density of the lower layers, where rock fragments are more common, is 1.72 g/cm ^{3} . The total porosity is up to 48%, the porosity of aerated soil varies from 32% to 45%, and the maximum hygroscopicity varies from 10.4% to 2.2%.

In the vegetation cover of the Karnabchul, along with the group of wormwood-ephemeral plants, there are also groups consisting only of ephemeral herbs. The reason for this is the chemical and mechanical properties of the soil. However, the vegetation cover of the Karnabchul is characterized by the coexistence of more wormwood and ephemeral and ephemeroid species, that is, together they form a single plant community (phytocenosis). The deserts of Central Asia are divided into 4 main types according to the characteristics of the vegetation cover: shrub-herbaceous; herbaceous-saline; semi-shrub-ephemeral and ephemeral. In general, the vegetation cover of the desert region is distinguished by the diversity of life forms and species. According to the studies conducted, 238 species of flowering plants have been recorded in the flora of the Karnabchul. These plant species belong to 138 families, of which 216 species are herbaceous plants (90.8%), 12 species are semi-shrubs (5.0%) and 10 species (4.2%) are shrubs . The most common species in the vegetation cover of the studied area include: wormwood - Artemisia diffusa, Krasch. Ex Poljak, A.turanica Krasch, Salsola orientalis S.Gmel., Halothamnus subaphulla (GAMey), Carex pachyustulis L., Gade stritata Markel. Ex Bunge; Ferula assa foetida (Bunge) Regel, Anisantha tectorum (L) . Nevski, Bromus danthanige Trin, Malcolmia turkestanica Litv., Trigonella noeana Boiss., leptaleum Filefolim (Willd) DS species of fenugreek - Eremopyrum orientale (L.) Gaub. 1 Spach,E. hirsitum (Bertel.) Nevsky and others are found in abundance. In the natural flora of Karnobchul, annual salt grasses such as Salsola scleranta, fish eye - Climacoptera lanata, rabbit -Halocharis hispida , and coarse-stemmed plants such

as Alhagi pseudalhagi, and carrack Cousinia resinosa are found . Wormwood-ephemeral Karnobchul pastures are based on wormwood, and only 15-20% are ephemeral grasses, and only in the spring season these barra grasses make up 40-50% of the food of Karakul sheep. Feed reserves in such pastures are 1.6-3.0 centners of dry mass per hectare in different years, and they also change sharply throughout the seasons.

Conclusion: It should be noted that pastures provide food for livestock in all seasons of the year. Therefore, almost all types of steppe pastures are suitable for year-round use. The diversity and complexity of soil conditions provide a diversity and specificity of plant cover. Unlike sandy deserts, the number of livestock kept in the hilly and gypsum desert regions is much higher, and in most farms one sheep has less than 1 ha of pasture. This, in turn, has led to a 3-4-fold increase in pressure on pastures and an increase in pasture degradation, as well as a gradual decline in biodiversity.

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QIZLAR O'RTASIDA KURASH SPORTINI RIVOJLANTIRISHNING DOLZARB MUAMMOLARI VA ISTIQBOLLARI: GENDER TENGLIGI, IMKONIYATLAR, RIVOJLANISH YO'NALISHLARI

Annotatsiya: *Ushbu maqolada O'zbekistonda qizlar o'rtasida kurash sportini rivojlantirish masalalari, mavjud muammolar, gender tengligi asosidagi imkoniyatlar va istiqbollar yoritilgan. Tadqiqotda sotsiologik so'rov, kuzatuv va statistik ma'lumotlar tahlili asosida kurash sporti bilan shug'ullanayotgan qizlar duch kelayotgan to'siqlar aniqlangan. Maqolada ijtimoiy stereotiplar, infratuzilma yetishmovchiligi, oilaviy qarashlar va davlat tomonidan olib borilayotgan ijobiy siyosat orqali bu muammolarning yechimlari taklif etiladi.*
Kalit so'zlar: *kurash, qizlar sporti, gender tengligi, sport siyosati, stereotiplar, motivatsiya, infratuzilma.*

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CURRENT ISSUES AND PROSPECTS FOR THE DEVELOPMENT OF WOMEN'S WRESTLING: GENDER EQUALITY, OPPORTUNITIES, AND DEVELOPMENT DIRECTIONS

Abstract: *This article explores the current challenges and future prospects of developing women's wrestling in Uzbekistan. Based on sociological surveys, observations, and statistical analysis, the study identifies the main barriers faced by girls in engaging with the sport. It highlights social stereotypes, infrastructure deficiencies, family restrictions, and the role of state policy in addressing these challenges and creating a supportive environment for female athletes.*
Keywords: *wrestling, girls' sport, gender equality, sports policy, stereotypes, motivation, infrastructure.*

Kirish

Qadimiy va milliy sport turi sifatida tanilgan kurash O'zbekiston sport madaniyatining ajralmas qismi hisoblanadi. Tarixan erkaklar bilan bog'liq bo'lgan bu sport turi hozirgi kunda gender tengligi siyosati doirasida ayollar orasida ham ommalashib bormoqda. Ayni paytda mamlakatimizda xotin-qizlarni sportga jalb

etish, ular uchun qulay infratuzilma yaratish, madaniy va ijtimoiy to‘siqlarni bartaraf etish davlat siyosatining muhim yo‘nalishlaridan biridir. Shu bois qizlar o‘rtasida kurash sportining bugungi holati, muammolari va istiqbollari chuqur ilmiy tadqiqot talab etadi. Mazkur maqolaning maqsadi – qizlar o‘rtasida kurash sportini rivojlantirishdagi dolzarb muammolarni aniqlash, mavjud imkoniyatlarni tahlil qilish va istiqbolli yo‘nalishlarni asoslashdir. Maqola doirasida gender tengligi, sportda ijtimoiy stereotiplar, rasmiy siyosat va sport tarbiyasidagi o‘zgarishlar markaziy o‘rinda turadi

Uslub (Metodologiya)

Tadqiqot Toshkent, Farg‘ona va Samarqand viloyatlaridagi sport maktablari va kollejlarida olib borildi. So‘rovnoma usuli orqali 120 nafar qiz sportchi va 40 nafar murabbiy fikrlari yig‘ildi. So‘rovnoma savollari asosan kurash sportiga qiziqish, ishtirokdagi to‘siqlar, oilaviy munosabat, murabbiylik yondashuvi va infratuzilma borasidagi sharoitlarni qamrab oldi. Shuningdek, 2020–2024 yillardagi O‘zbekiston Respublikasi Jismoniy tarbiya va sport vazirligi ma’lumotlari asosida 632tatistic tahlil o‘tkazildi. Bevosita kuzatuvlar kurash musobaqalarida va o‘quv-mashg‘ulot jarayonlarida olib borildi. Maqolada olingan ma’lumotlar tahliliy metod orqali umumlashtirildi[2, 36]

Natijalar

Tadqiqot natijalari shuni ko‘rsatadiki, qizlar o‘rtasida kurash sportini rivojlantirishga to‘sqinlik qilayotgan asosiy omillar ijtimoiy stereotiplar, oilaviy bosim, sportga mo‘ljallangan maxsus infratuzilmaning yetishmasligi va ayol murabbiylarning kamligi bilan bog‘liq. So‘rovnoma qatnashchilarining 63 foizi kurash sporti erkaklarga xos deb hisoblanishini bildirgan, 58 foizi esa ota-onalari sport bilan shug‘ullanishlariga to‘sqinlik qilishini aytgan. Shu bilan birga, 45 foiz qiz sportchilar o‘z hududlarida ayollar uchun maxsus sport zallari mavjud emasligini ta’kidlagan. Shu bilan birga, O‘zbekiston hukumati tomonidan oxirgi yillarda qizlar sportini qo‘llab-quvvatlash borasida ijobiy qadamlar qo‘yilgan. 2021-yildan boshlab ayollar sporti uchun maxsus grantlar va o‘quv markazlari tashkil etilgan, xalqaro musobaqalarda qatnashayotgan ayol sportchilarning ko‘rsatkichi ortgan. Masalan, 2023-yilgi Osiyo o‘yinlarida o‘zbekistonlik qiz kurashchilar 4 ta oltin medalni qo‘lga kiritgan[6, 116]

Muhokama

Ushbu natijalar shuni ko‘rsatadiki, qizlar kurash sportiga qiziqmoqda, ammo ularni qo‘llab-quvvatlovchi ijtimoiy va infratuzilmaviy muhit hali yetarli emas. Gender tengligini ta’minlash uchun nafaqat qonuniy asos, balki ijtimoiy ongdagi o‘zgarishlar ham zarur. Qizlar uchun maxsus sport dasturlarini ishlab chiqish, ayol murabbiylar sonini ko‘paytirish, sport maktablarida rag‘batlantiruvchi tizimlar yaratish lozim. Shu bilan birga, ommaviy axborot vositalarida ayol sportchilarning yutuqlari keng yoritilishi kerak. Rol model bo‘ladigan sportchilar orqali motivatsion muhit yaratish, mahallalarda sport tadbirlarini ko‘paytirish, sportda oilaviy qo‘llab-quvvatlovni kuchaytirish qizlarning sportdagi ishtirokini oshiradi. Xalqaro tajribalar shuni ko‘rsatadiki, ayollar sportini muvaffaqiyatli rivojlantirayotgan davlatlarda hukumat va jamiyat hamkorligi muhim rol o‘ynaydi. O‘zbekiston

sharoitida ham kurash sportini rivojlantirishda ijtimoiy qadriyatlarni hisobga olib, milliy an’analarni saqlagan holda zamonaviy yondashuvlar asosida rivojlanish imkoniyati mavjud. Masalan, Navro‘z, Mustaqillik kuni kabi bayramlarda qizlar o‘rtasida kurash ko‘rsatmalari tashkil etilishi mumkin.

Xulosa

Qizlar o‘rtasida kurash sportini rivojlantirish O‘zbekiston sport sohasining dolzarb yo‘nalishlaridan biri bo‘lib, bu jarayonda mavjud muammolarni chuqur tahlil qilish, amaliy yechimlar ishlab chiqish va kelajak uchun aniq reja asosida harakat qilish zarur. Gender tengligiga asoslangan sport siyosatini kengaytirish, ayollar uchun qulay muhit yaratish va jamiyatda sportga bo‘lgan ijobiy qarashni shakllantirish orqali qizlar kurash sportida yuksak natijalarga erishishi mumkin. Bu esa nafaqat sport, balki sog‘lom turmush tarzini shakllantirish, ijtimoiy faollikni oshirish va O‘zbekiston ayollarining dunyo miqyosidagi nufuzini mustahkamlashga xizmat qiladi.

Foydalanilgan adabiyotlar:

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TECHNO-ECONOMIC PERSPECTIVES ON HYDROGEN STORAGE IN NANOSTRUCTURED CARBON SYSTEMS

The urgent global transition toward sustainable energy solutions has positioned hydrogen as a vital energy carrier, particularly in the context of carbon-neutral technologies. The versatility of hydrogen, derived from various sources including renewable methods such as electrolysis, underscores its potential in mitigating climate change and enhancing energy security. This essay explores the techno-economic perspectives on hydrogen storage within nanostructured carbon systems, emphasizing innovative materials that could revolutionize storage technologies. Effective hydrogen storage mechanisms are paramount, as they directly impact the efficiency and feasibility of hydrogen applications in various sectors, including transportation and industrial processes. Critical performance indicators, such as the Levelized Cost of Hydrogen (LCOH) and Energy Return on Energy Invested (EROEI), will serve as benchmarks for assessing economic viability (Abuashour et al., 2024)(Barbera et al., 2023). Furthermore, visualizations like will enhance our understanding of the complex interplay between production and storage methods, providing a framework for future research and policy development.

1. OVERVIEW OF HYDROGEN STORAGE TECHNOLOGIES

The exploration of hydrogen storage technologies is crucial for enhancing the efficiency and feasibility of a hydrogen economy. Various methods exist, including gaseous, liquid, and solid storage, each with distinct advantages and challenges. Gaseous storage, typically compressed at pressures of 350 to 700 bar, offers ease of handling but compromises density, making its application predominantly suitable for Fuel Cell Electric Vehicles (FCEVs) (Gour et al., 2024). On the other hand, liquid hydrogen, stored cryogenically at -253 °C, provides a higher energy density, yet involves complex thermal management (Azam et al., 2025). Solid storage methods, utilizing materials like metal hydrides, hold promise for high-density applications and allow gradual hydrogen release, though difficulties in kinetics remain a barrier. The integration of nanostructured carbon systems into these technologies could optimize storage capacity and performance, thereby influencing the overall economic viability of hydrogen applications. This technological landscape is visually summarized in , shedding light on these critical distinctions and their implications in practical applications.

2. IMPORTANCE OF NANOSTRUCTURED CARBON SYSTEMS IN ENERGY STORAGE

Nanostructured carbon systems play a pivotal role in enhancing energy storage, particularly in the context of hydrogen storage technologies. Their unique properties, including high surface area, tunable porosity, and exceptional electrical conductivity, make them ideal candidates for efficient hydrogen adsorption and desorption processes. This efficiency is critical, as the capacity for safe and effective hydrogen storage is essential for the broader adoption of hydrogen as a clean energy carrier. Recent research highlights the effectiveness of nanostructured materials in solid-state hydrogen storage, which significantly improves storage density and kinetics, thereby facilitating practical applications in energy systems (Abuashour et al., 2024). Moreover, the integration of nanotechnology with advanced materials, such as metal-organic frameworks and hybrid systems, further enhances the performance of hydrogen storage solutions (Breunig et al., 2024). Visual representations, like the one provided in , underscore the interconnected processes of hydrogen production and the critical role nanostructured systems play in enabling a sustainable hydrogen economy.

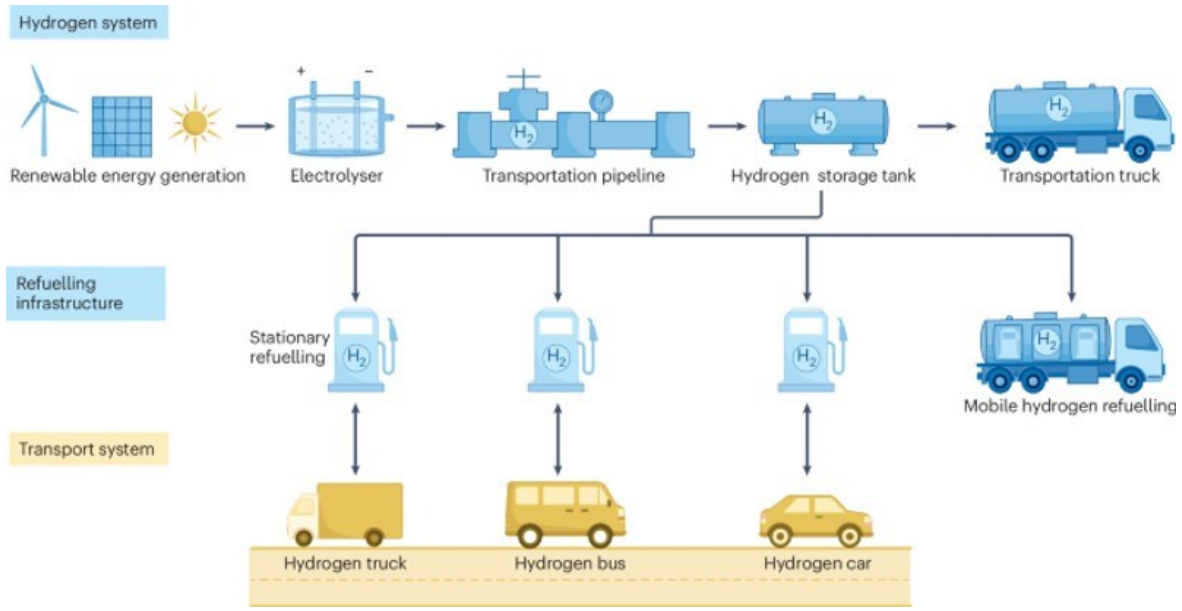


Image1. Schematic of hydrogen energy generation and refueling infrastructure.

1. Fundamentals of Hydrogen Storage

Within the context of hydrogen storage, the fundamental principles pivot around achieving optimal density and efficiency, crucial for practical applications like fuel cell technology. Traditional storage methods, such as compressed gas or cryogenic liquid systems, face limitations in the form of high energy requirements and safety concerns. Recent advancements explore the realm of solid-state hydrogen storage, particularly emphasizing the role of nanostructured carbon systems, which enhance hydrogen uptake and release through mechanisms like physisorption and chemisorption. Such materials not only improve the volumetric density of hydrogen storage but also promise greater safety profiles compared to conventional methods

(Breunig et al., 2024). Moreover, innovative approaches integrating these materials with catalytic processes underpin the techno-economic viability of the hydrogen economy, as reflected in various cost and efficiency analyses (Abuashour et al., 2024). The integration of nanostructured systems fundamentally shifts the landscape, making hydrogen a more accessible and practical energy solution. Additionally, the potential benefits can be visually summarized through , elucidating the technologys infrastructure and applications.

1. MECHANISMS OF HYDROGEN STORAGE IN NANOSTRUCTURED MATERIALS

The mechanisms of hydrogen storage in nanostructured materials are pivotal in developing efficient and scalable hydrogen energy systems. Nanomaterials, particularly metal-organic frameworks (MOFs) and graphene-based structures, enhance hydrogen adsorption through increased surface area and tunable pore sizes, facilitating both physisorption and chemisorption processes. The unique properties of nanostructured materials allow for improved kinetics of hydrogen uptake and release, making them suitable for solid-state storage solutions essential for future energy applications. Recent advancements also indicate that incorporating microwave technology can optimize synthesis processes and enhance the catalytic efficiency of hydrogen production and storage systems (Azam et al., 2025). Moreover, the integration of these nanostructured materials into hydrogen fuel technology not only addresses volumetric and gravimetric challenges but also holds significant promise for cost reductions in hydrogen storage applications, aligning with the techno-economic perspectives of sustainable energy systems. The exploration of these mechanisms is further illustrated in , emphasizing the potential of solid-state hydrogen storage in addressing environmental concerns.

2. COMPARISON OF NANOSTRUCTURED CARBON SYSTEMS WITH TRADITIONAL STORAGE METHODS

The evaluation of nanostructured carbon systems for hydrogen storage reveals a stark contrast to traditional storage methods, offering enhanced performance metrics crucial for future energy applications. Unlike conventional approaches that typically rely on high-pressure gas storage or cryogenic liquid storage, which pose safety risks and volumetric constraints, nanostructured materials, such as carbon nanotubes and graphene, exhibit superior adsorption capabilities and structural stability (Breunig et al., 2024). These advanced materials facilitate the physisorption and chemisorption of hydrogen, thereby improving the efficiency of storage systems and enabling compact designs (Abuashour et al., 2024). Additionally, the innovative integration of nanotechnology into hydrogen storage not only addresses common challenges such as energy losses during compression and temperature management but also offers potential for on-demand hydrogen release in various applications. The implications of these advancements underscore the importance of further research and development in optimizing nanostructured carbon systems, which stands to revolutionize the hydrogen economy. This notion underpins the systems importance, visually supported by ,

which illustrates the significant differences in storage density and application efficacy between nanostructured materials and traditional methods.

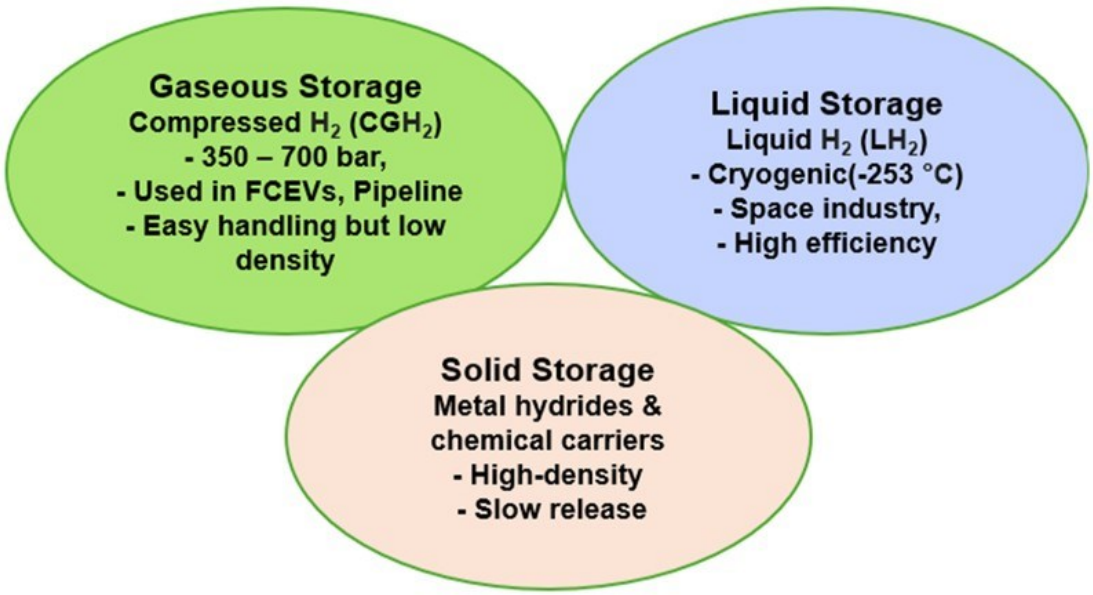


Image2. Hydrogen Storage Methods: Gaseous, Liquid, and Solid Storage Overview

Material Type	Storage Capacity (wt%)	Storage Capacity (g/L)	Temperature (°C)	Pressure (MPa)
Activated Carbon	5.5	45	-196	6.0
Graphite	4.48	N/A	Room Temperature	N/A
Single-Walled Carbon Nanotubes	4.5	N/A	77 K	N/A
Multi-Walled Carbon Nanotubes	6.3	N/A	77 K	N/A
Carbon Nanofibers	6.5	N/A	77 K	N/A
Compressed Hydrogen Gas	N/A	13–18	Ambient	70
Liquid Hydrogen	N/A	70	-253	N/A

Comparison of Hydrogen Storage Capacities in Nanostructured Carbon Materials and Traditional Methods

2. Economic Viability of Nanostructured Carbon Systems

The economic viability of nanostructured carbon systems as a medium for hydrogen storage is increasingly supported by advances in material science and engineering. The integration of nanocomposites and carbon-based materials, such as graphene and carbon nanotubes, has shown promising results in enhancing storage capacity and efficiency while reducing costs associated with traditional storage methods. Moreover, emerging catalytic processes and electrochemical techniques have potential applications in hydrogen production that can be further optimized, leading to a more sustainable hydrogen economy. This potential is

underscored by the necessity for interdisciplinary collaboration to overcome existing challenges and unlock new market opportunities ((Abuashour et al., 2024)). Additionally, the electrochemical conversion of CO2 into valuable products represents a significant economic opportunity, contributing to the circular economy while addressing carbon emissions ((Baena-Moreno et al., 2022)). By exploring innovative applications and refining production methods, the economic feasibility of these nanostructured systems can be substantially enhanced, reinforcing their role in future energy solutions. The detailed synthesis of these systems is illustrated in , which provides a comprehensive representation of solid-state hydrogen storage mechanisms.

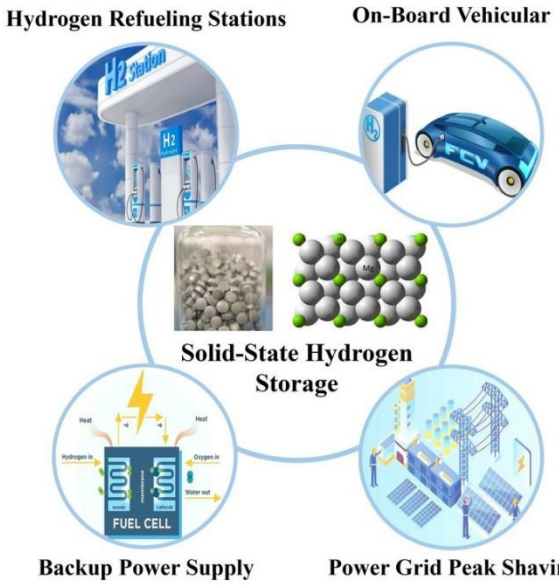


Image3. Applications and Benefits of Solid-State Hydrogen Storage

1. COST ANALYSIS OF PRODUCTION AND IMPLEMENTATION

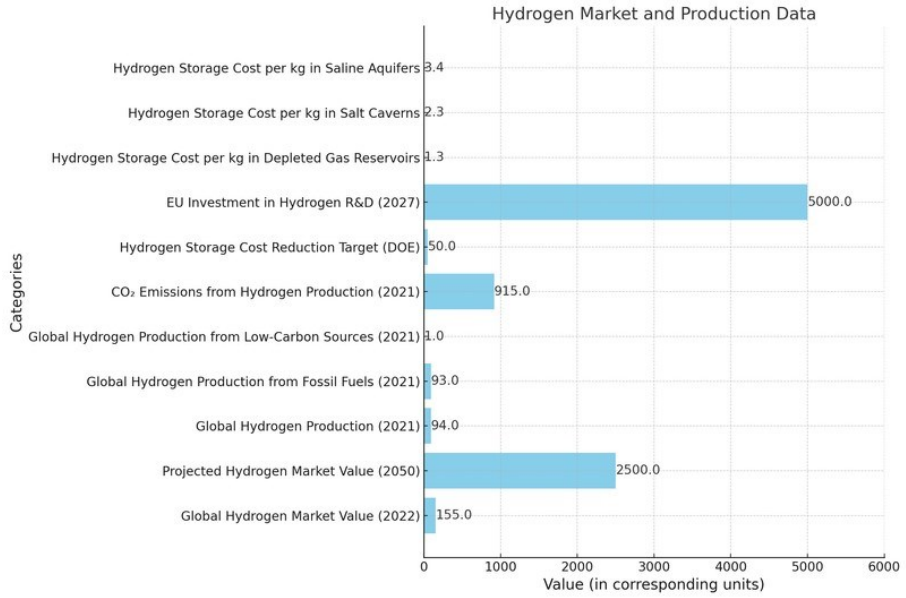
An effective cost analysis of hydrogen production and implementation reveals significant disparities among various generation technologies, influencing broader adoption of hydrogen storage solutions in nanostructured carbon systems. For instance, research suggests that while the Levelized Cost of Hydrogen (LCOH) for green hydrogen produced via renewable energy sources is approximately 8.76, blue hydrogen offers a more competitive rate at 5.50, though with a less favorable environmental impact (Barbera E et al., 2023). The financial breakdown of these processes necessitates comprehensive evaluations of capital and operational expenses, as illustrated by the flowchart in , which outline hydrogen production through electrolysis. This flowchart not only simplifies the understanding of the production process but also emphasizes the critical steps that affect cost efficiency. Ultimately, the techno-economic assessment underscores the need for strategic investments in greener technologies to enhance hydrogens viability as an alternative fuel in various applications (Barbera et al., 2023).

Synthesis Method	Cost per Gram ($)	Greenhouse Gas Emissions (kg CO_2 per gram)
Electric Arc Discharge	1906	28.55
Chemical Vapor Deposition (CVD)	1706	0.02
High-Pressure Carbon Monoxide (HiPco)	485	Data not specified
Graphene Oxide	50–990	Conventional methods
Graphene from Biomass Waste	5.41–8.84	Flash-joule technology from biomass waste

Cost Analysis of Hydrogen Storage in Nanostructured Carbon Systems

2. MARKET POTENTIAL AND ECONOMIC IMPACT ON THE ENERGY SECTOR

The market potential for hydrogen storage within nanostructured carbon systems is increasingly recognized as a critical element in the energy sectors transition toward sustainability. As global energy demands escalate, innovative hydrogen storage solutions can significantly reduce reliance on fossil fuels by providing a viable alternative for clean energy applications. The integration of advanced materials, particularly those enhanced by nanotechnology, not only boosts hydrogen storage capacity but also optimizes energy efficiency (Breunig et al., 2024). Furthermore, the economic implications of these technologies are profound, as they can diminish costs associated with energy production and greenhouse gas emissions, aligning with the goals of a circular economy (Baena-Moreno et al., 2022). The strategic development and commercialization of hydrogen storage systems thus hold the potential to transform the energy landscape, fostering both environmental sustainability and economic growth. Such advancements promise to facilitate a robust response to the challenges posed by climate change while driving innovation in the energy sector.



This bar chart presents various statistics related to the hydrogen market. It shows the global hydrogen market value for 2022 and projected values for 2050, along with production figures from 2021. The chart highlights the disparity between projections and current values, particularly the significant investment expected in hydrogen R&D by 2027. Additionally, it addresses CO_2 emissions from hydrogen production alongside various costs associated with hydrogen storage.

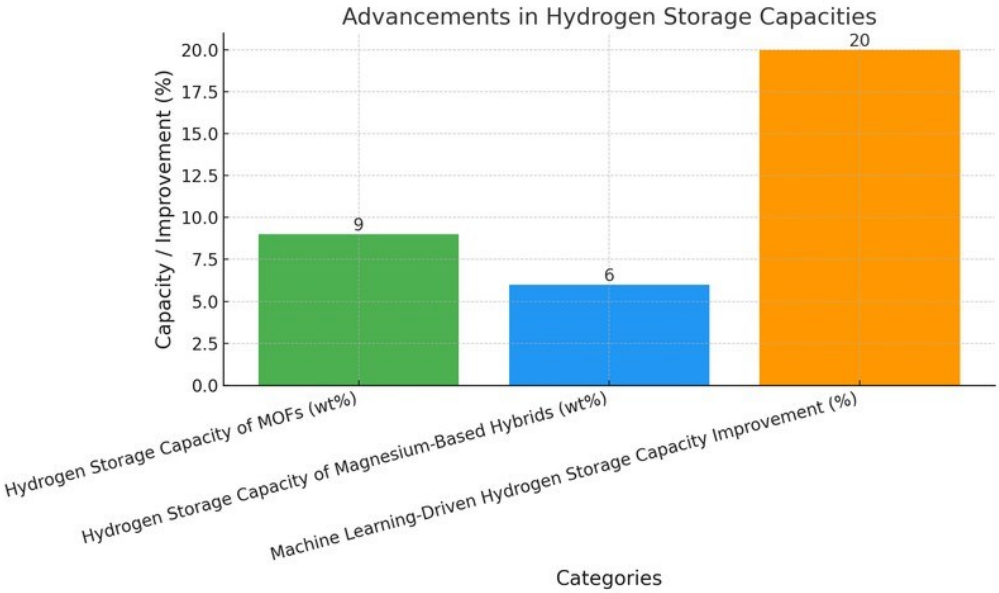
3. Technological Innovations in Nanostructured Carbon Systems

Recent advancements in nanostructured carbon systems have revealed significant potential for enhancing hydrogen storage solutions, primarily through the development of innovative materials that improve storage efficiency and capacity. For instance, carbon nanotubes and graphene exhibit exceptional surface areas and tunable porosity, which facilitate the adsorption of hydrogen at higher densities compared to traditional storage methods. Such innovations are crucial in aligning with global efforts to adopt green hydrogen technologies, which are integral to decarbonizing various sectors as highlighted in the increasing focus on hydrogen production via renewable sources ((Zhang J et al., 2024)). Furthermore, the economic viability of these technologies is enhanced by the integration of advanced nanostructured materials that allow for more efficient hydrogen storage and transport mechanisms, as detailed in the comparative considerations of current methodologies ((Politano A et al., 2024)). The holistic synergy between technological improvements and economic assessments positions nanostructured carbon systems as a centerpiece in the pursuit of sustainable energy storage solutions, ultimately shaping a more resilient energy landscape. For a visual representation of the hydrogen production and storage framework, refer to .

1. ADVANCES IN MATERIAL SCIENCE ENHANCING HYDROGEN STORAGE CAPACITY

The integration of advanced materials in hydrogen storage technologies exemplifies a significant shift in material science aimed at enhancing storage capacity, critical for supporting hydrogen as a sustainable energy vector. Recent developments highlight the efficacy of nanostructured materials, such as metal-

organic frameworks (MOFs) and magnesium-based hybrids, which offer superior adsorption properties through physisorption and chemisorption mechanisms. These innovations facilitate efficient hydrogen uptake and release, addressing the fundamental challenges of high-pressure or cryogenic storage configurations. Moreover, the implementation of machine learning algorithms in material discovery accelerates the identification of optimal compositions and structures, significantly reducing the time and costs associated with experimental validation (Breunig et al., 2024). As indicated, the focus on these nanostructured systems not only advances material capabilities but also aligns with broader tech-economic strategies to integrate hydrogen solutions into existing energy infrastructures, promoting a pathway toward a sustainable future (Abuashour et al., 2024).



The chart illustrates the advancements in hydrogen storage capacities across three categories: Metal-Organic Frameworks (MOFs), magnesium-based hybrids, and machine learning-driven improvements. The highest capacity improvement is seen with machine learning, reaching 20%, while MOFs and magnesium-based hybrids show capacities of 9% and 6%, respectively. This data highlights the significant role of machine learning in enhancing hydrogen storage technologies.

2. INTEGRATION OF NANOSTRUCTURED CARBON SYSTEMS WITH RENEWABLE ENERGY SOURCES

The integration of nanostructured carbon systems with renewable energy sources presents an unprecedented opportunity to enhance hydrogen storage technologies, which are crucial for a sustainable energy future. By utilizing materials such as graphene and carbon nanotubes, researchers can significantly improve the efficiency and capacity of hydrogen storage systems, making them more viable for widespread application. This synergy becomes particularly relevant as renewable energy sources, like solar and wind, can generate hydrogen through processes such as water electrolysis, which can be stored and utilized effectively in societal energy systems (Curto D et al., 2024). Furthermore, with advancements in nanomaterials, the safety and release mechanisms of stored hydrogen can be optimized, facilitating on-demand energy applications (Abuashour et al., 2024).

Given these developments, the potential for nanostructured carbon systems to act as an efficient bridge between hydrogen production and renewable energy highlights a transformative pathway towards carbon-neutral energy solutions. The accompanying image, , visually encapsulates this relationship by depicting the flow of hydrogen produced through renewable sources, reinforcing the critical interconnectedness of these technologies.

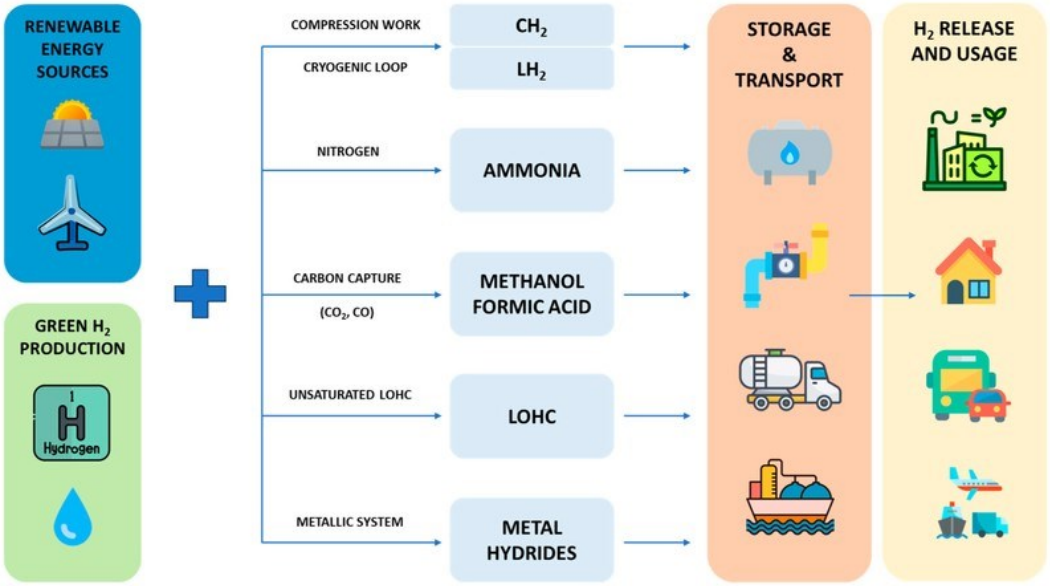


Image4. Flowchart of Green Hydrogen Production and Utilization

4. Conclusion

In summary, the exploration of hydrogen storage within nanostructured carbon systems underscores its critical role in establishing a sustainable energy future. The integration of advanced materials in hydrogen storage not only enhances capacity and safety but also democratizes energy access across diverse applications, supported by effective techno-economic analyses (Abuashour et al., 2024). Moreover, the examination of various storage methodologies, including liquid, gaseous, and solid-state forms, reveals intricate trade-offs between efficiency, cost, and practical viability. The insights from this study pave the way for innovative strategies in hydrogen production and utilization, contributing to the broader goal of carbon neutrality (Brautaset et al., 2024). As we confront pressing global energy challenges, including resilience against climate change and resource depletion, the adoption of these nanostructured solutions represents a significant leap toward a more sustainable hydrogen economy. The implications of this research, illustrated by , further emphasize the potential impact of smart energy solutions in combating impending ecological challenges.

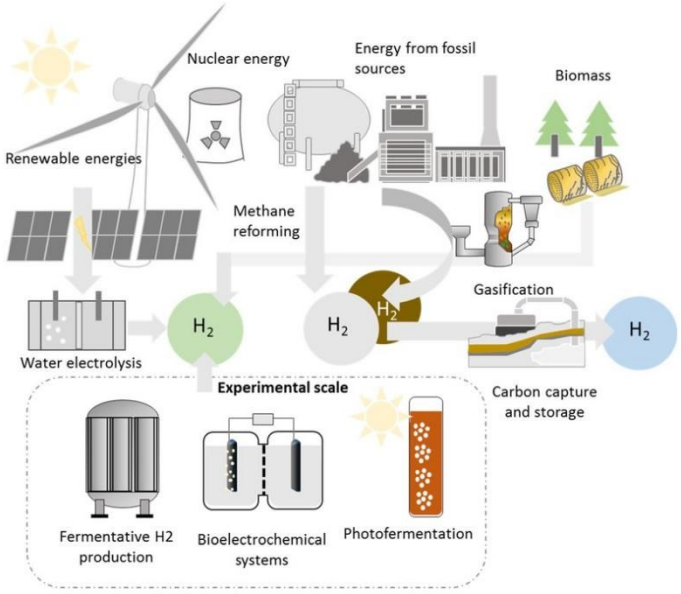


Image5. Hydrogen Production Methods and Energy Sources

1. SUMMARY OF KEY FINDINGS AND IMPLICATIONS FOR FUTURE RESEARCH

The exploration of hydrogen storage within nanostructured carbon systems reveals significant findings that underscore the critical need for ongoing research and innovation. The comprehensive review of hydrogen storage technologies emphasizes the potential of nanomaterials to enhance storage capacity, safety, and overall efficiency, as indicated by the potential applications of solid-state hydrogen systems ((Gour et al., 2024)). Furthermore, the increasing emphasis on integrating hydrogen production technologies with renewable energy sources highlights a dual pathway for addressing future energy demands while mitigating environmental concerns ((Abuashour et al., 2024)). Future research should not only focus on optimizing material properties for better performance but also explore the economic implications of these technologies in varying scales of application, particularly in transportation and large-scale energy systems. This holistic approach to hydrogen storage technologies, as illustrated in the diagram of hydrogen systems (), is essential for developing a sustainable hydrogen economy.

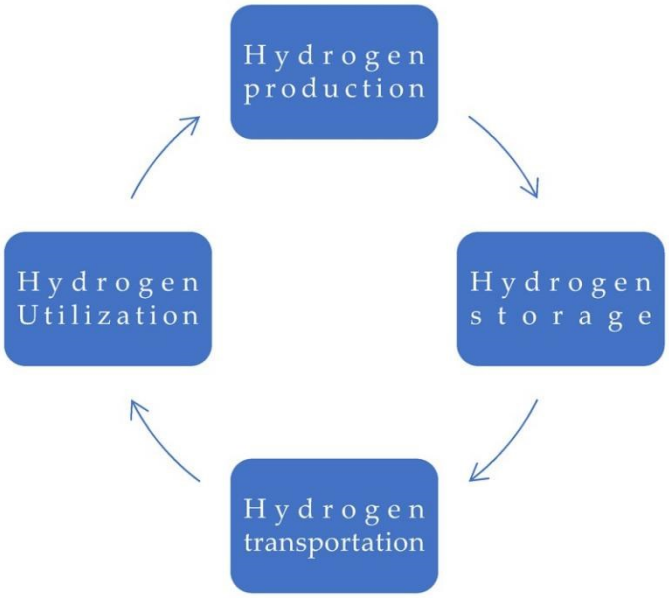


Image6. Flowchart of the Hydrogen Economy Process

2. FINAL THOUGHTS ON THE ROLE OF NANOSTRUCTURED CARBON SYSTEMS IN SUSTAINABLE ENERGY SOLUTIONS

In concluding the exploration of nanostructured carbon systems, it is evident that these materials hold considerable promise for transforming sustainable energy solutions, particularly in hydrogen storage applications. The versatility of nanostructured carbons facilitates enhanced storage capacity and efficiency, making them ideal for meeting the rising global demand for clean energy technologies. Recent advancements have demonstrated their ability to improve the performance of hydrogen production techniques, such as electrolysis, by providing effective catalytic support (Abuashour et al., 2024). Furthermore, innovations in solid-state hydrogen storage utilizing nanostructured carbon can address the safety concerns and energy density limitations associated with traditional storage methods (Liu et al., 2024). This synergy between nanotechnology and hydrogen solutions not only underscores the potential of nanostructured carbon systems to play a pivotal role in the hydrogen economy but also highlights the urgent need for interdisciplinary research to advance these technologies for sustainable energy futures. To illustrate this critical juncture, the flowchart of hydrogen production via electrolysis in encapsulates the potential pathways that underpin these advancements.

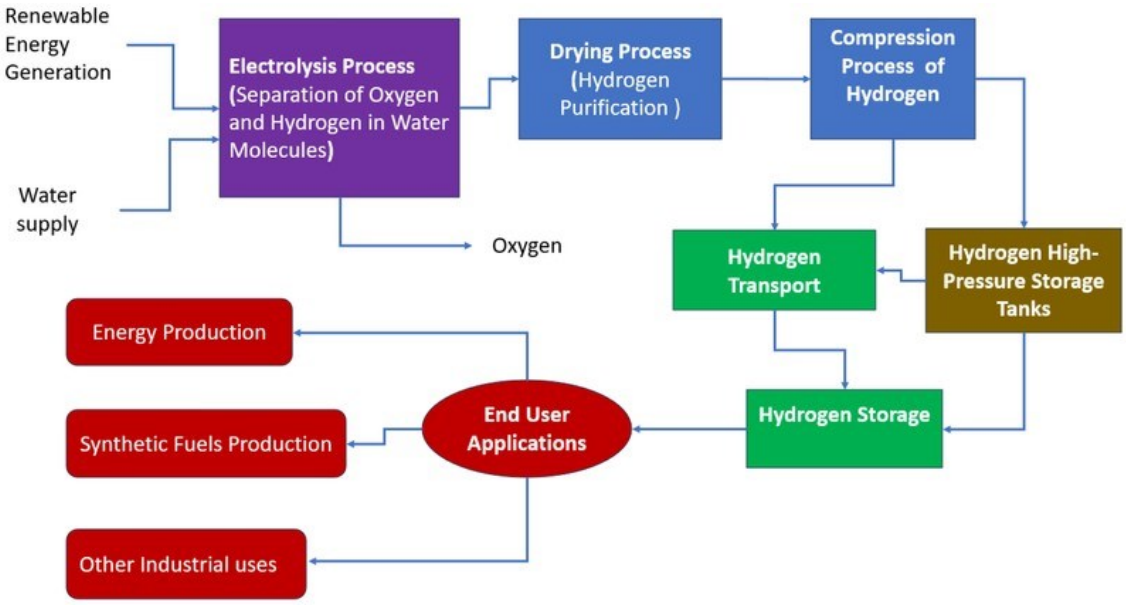


Image7. Flowchart of Hydrogen Production Process via Electrolysis

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HISTOLOGICAL STRUCTURE OF THE PROSTATE GLAND IN EXPERIMENTAL ANIMALS

Abstract: *The article studies the anatomical and histological features of the prostate gland in one of the experimental animals - a dog. The parenchyma of the gland is well developed and consists of connective and muscle tissue on the outside, which penetrates into the gland and forms intercellular barriers. The stroma consists of oval and round cavities. The epithelium of the inner lining of the cavities is homogeneous and cylindrical, while the tubules are covered to a greater extent with cubic epithelial cells.*

Keywords: *dog, prostate gland, hematoxylin-eosin, Van-Gieson, elastic fibers, stroma, argyrophilic fibers, nerve fibers.*

Introduction. In recent years, scientific literature and defended research papers have lacked information regarding the histological structure and morphology of the canine prostate gland [3,8]. No studies specifically examining the intramural nervous system of the prostate have been identified. However, some researchers have investigated intramural nervous structures in digestive organs [1,7]. Studies have explored the vegetative nerve fibers of venous blood vessels in the walls of the stomach and esophagus under normal conditions and in liver cirrhosis [2,6]. Nevertheless, no data were found in the literature on the anatomical-histological structure and morphology of intramural vegetative ganglia of the prostate gland in experimental animals, such as dogs [4,5].

Research Objective: To study the anatomical-histological structure of the prostate gland in healthy adult dogs.

Materials and Methods: The study was conducted on prostate glands obtained from eight healthy adult dogs, one of the experimental animals. The materials were fixed in 12% neutral formalin. To examine the general histological structure, tissues were stained with Hematoxylin-Eosin. Elastic fibers were identified using the Van Gieson method. Argyrophilic fibers were stained using the Donskoy method. To study the nervous system, histological sections were prepared using a freezing microtome and impregnated using the Bielschowsky-Gross, Rasskazova, and Campos methods.

Research Results The canine prostate gland is well-developed, with clearly defined lobules that are relatively large and possess an alveolar structure. The terminal secretory portions and excretory ducts are wide but not uniformly structured. They are lined internally with cylindrical epithelium, which in some areas forms papillary growths. In some secretory cavities, amorphous secretion with

visible granularity is observed. The stroma consists of connective and smooth muscle tissues, with a small number of thin elastic fibers located in the capsule, around glandular elements, and near blood vessels. The interlobular connective tissue is well-developed, extending thin layers into the lobules, surrounding the terminal secretory portions and ducts. Numerous blood vessels and large nerve nodes are present around the capsule. Argyrophilic fibers are well-developed, with internal and external argyrophilic membranes composed of thin and thick fibers. A large and small reticular network of argyrophilic fibers is visible in the stroma. Intramural nerve fibers are present in significant quantities, particularly in the organ's periphery. These are represented by nerve bundles, nodes, and individual nerve fibers of varying thickness, sometimes varicose, tortuous, or straight. In some areas, they branch out, forming bush-like receptors that terminate in stromal or epithelial cells. The lobules vary in size, each containing numerous distinct terminal portions and ducts with smooth or tortuous lumens. The epithelium covering the terminal portions is typically multilayered cylindrical. Cell nuclei are well-stained, located basally, and have round or elongated oval shapes. Some duct walls and terminal secretory portions are lined with low cuboidal epithelium. The number of smooth muscles increases toward the gland's periphery, where striated muscles are also developed. Numerous blood vessels of varying calibers are present in the stroma, especially in the organ's outer regions. The external and internal argyrophilic membranes are well-developed, consisting of thin and thick, slightly tortuous fibers. Numerous nerve elements are primarily represented by nerve fibers and ganglia. Ganglion cells vary in size, with distinct round and oval nuclei. Small nodes composed of small multipolar nerve cells are observed in the central parts of the gland. Some nerve bundles and individual fibers are adjacent to glandular elements. Many nerve fibers penetrate the stroma, forming extensive receptor fields in some areas and reaching the epithelium of terminal portions and ducts. Numerous nerve endings, such as polyvalent receptors, dendritic receptors, and vascular receptors, are present. Genital corpuscle and bulb-type encapsulated receptors are widely distributed in the stroma, particularly along the periphery.

Conclusion: Our study allows the following conclusions. In dogs, in addition to a clearly defined lobular structure, there is well-developed stroma and parenchyma. The parenchyma contains very small terminal secretory portions and ducts. Alongside a distinct lobular structure, large terminal secretory portions and ducts covered with tall cylindrical epithelium forming papillary growths were identified. The canine prostate gland contains a significant number of nerve elements. These are numerous and diverse, represented by nerve trunks, branches, and various free and encapsulated receptors.

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ENVIRONMENTAL QUALITY ASSESSMENT INDICATORS AND THEIR SIGNIFICANCE

Annotation. *This article provides information on the types of indicator organisms that assess the quality of the environment in nature and the mechanisms for assessing the quality of the environment.*

Keywords. *Organisms, species, environment, ecology, ecosystem, environmental policy, indicator organisms, biodiversity, algae, water pollution, water bodies.*

Introduction. Today, the influence of the population on the geographical environment has increased so much that the initial natural state of the atmosphere, hydrosphere, biosphere, and lithosphere has changed somewhat. If the atmosphere, soil, and water are not kept clean, soil can be subjected to erosion, the number of plant and animal species may decrease, which can lead to damage to the national economy and negatively affect human health. The main sources of pollution of the republic's industry are factories and plants, the mining industry, utilities, transport, and agriculture.

Research methods. The word "indicator" comes from the Latin word "indicare," which means "to show, to mark." The word indicator is usually used as a means or sign indicating the state or change of something. This word is often used in science, technology, economics, and other fields. In the field of science, indicators are used to observe chemical reactions or biological processes.

An ecological indicator is the formation of flora or fauna organisms that provide information about the state of living organisms growing in the desired environment. To improve environmental monitoring, the Committee for Nature Protection of the Republic of Uzbekistan has developed a system of environmental indicators that quickly reveals environmental impacts. The legal basis of the Environmental Indicators System (EIS) is the Law "On Environmental Protection," approved by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated April 3, 2002, N-l. According to available environmental data in the republic and international experts, 91 emissions from Warsaw and Sapporo into the atmosphere are in Uzbekistan, while 22 indicators are for wastewater pollution. Since the species of plants growing in nature are diverse, the degree of their exposure to these harmful substances also varies. Some are affected by even a small

amount of sulfur dioxide, and the increase in the amount of harmful gases in the atmosphere can be detected by observing highly sensitive plants. Among lower plants, lichens belong to the category of organisms that are easily exposed to polluted atmospheres; first their clustered species, then their leafy species, and then the lichens themselves die completely.

Result of scientific work. The main goal of studying indicator organisms that determine the ecological state of the environment is to assess the health of the ecosystem and the ecological state. Such indicator organisms are used to identify various plant, animal, or microorganisms that are usually used as biological indicators, changes in the environment, pollution, or other negative factors.

Aquatic ecology: Water pollution and its impact (e.g., fish, plants). Air quality measurement: (Monitoring of air pollution by plants and lichens). Contaminated lands: (determining soil quality through rainfall and bacteria).

Trout (salmo trutta and other types of fish) is one of the indicator fish, as it helps determine the ecological state of water and the purity of water resources. The indicator properties of trout are as follows. The trout is very sensitive to oxygen and cannot survive in water with low oxygen levels. Therefore, their presence or absence indicates sufficient oxygen in the water. Trout fish live in cold water, and the temperature for their survival is around 10-150C. Trout prefer clean and unpolluted water. If there is a high level of pollution in the water, their population will decrease or disappear altogether. These fish are sensitive to chemicals in the water (such as pesticides, heavy metals) and are used as indicators to indicate water pollution.

Lichens are used to detect air pollution, especially the presence of acids and harmful gases. They change when the amount of acid in the air increases. Therefore, they are a good indicator for monitoring air pollution.

Some birds, such as waterfowl, are sensitive to changes in terrestrial or aquatic ecosystems, and their numbers and species help them understand the state of the environment. Changed migration or housing habits indicate changes in mortality rates.

The saltwort plant (that is, the genus salsola) is adapted to many ecological conditions and is used as an important indicator for agricultural crops. The Solyanka plant grows mainly in saline and saline soils. Therefore, it shows the state of soil in saline and salty environments. If the saltwort plant is developing well, this indicates a high salinity or salt content in the soil.

Festula avina (also called desert grass) This plant is often found in areas with low moisture levels in dry, poorly nutrient-rich soils.

Conclusion. Indicator organisms that determine the ecological state of the environment, namely plants, animals, and microorganisms, play a crucial role in monitoring changes and pollution in the ecological system. They effectively assist in assessing the health and sustainability of the environment. It is extremely important to maintain the cleanliness of natural water bodies, recognizing their important role in human life. Everyone should contribute to keeping it clean, and for this, it is necessary to explain to our children from an early age that they love nature and must keep it clean and pure, and that environmental pollution and water

pollution lead to negative consequences for us. Therefore, let's protect and cherish nature!

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QASHQADARYO VILOYATIDA ERKIN IQTISODIY ZONALAR FAOLIYATINI TAKOMILLASHTIRISHNING HUDUDIY JIHATLARI

Annotatsiya: *Ushbu ilmiy ishda O‘zbekistonning Qashqadaryo viloyatida erkin iqtisodiy zonalarni tashkil etish va rivojlantirish jarayonidagi muammolar tahlil qilinadi. Tadqiqotda viloyatdagi mavjud erkin iqtisodiy zonalar, ularning faoliyatini samarali tashkil etishdagi to‘siqlar, infratuzilma muammolari, byurokratik to‘siqlar va investitsiya muhitining holati o‘rganiladi. Shuningdek, xalqaro tajribalar asosida Qashqadaryo viloyatida erkin iqtisodiy zonalarni samarali rivojlantirish uchun takliflar ishlab chiqiladi.*

Kalit so‘zlar: *Erkin iqtisodiy zonalar, Qashqadaryo viloyati, infratuzilma, investitsiya muhiti, byurokratiya, xalqaro tajriba.*

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REGIONAL ASPECTS OF IMPROVING THE ACTIVITIES OF FREE ECONOMIC ZONES IN KASHKADARYA REGION

Annotation: *This scientific work analyzes the problems in the process of establishing and developing free economic zones in the Kashkadarya region of Uzbekistan. The study examines the existing free economic zones in the region, obstacles to the effective organization of their activities, infrastructure problems, bureaucratic obstacles and the state of the investment environment. Also, based on international experience, proposals are developed for the effective development of free economic zones in the Kashkadarya region.*

Keywords: *Free economic zones, Kashkadarya region, infrastructure, investment environment, bureaucracy, international experience.*

Kirish. O‘zbekiston Respublikasi Prezidenti tomonidan imzolangan farmonlar asosida Qashqadaryo viloyatida erkin iqtisodiy zonalarni tashkil etish bo‘yicha bir qator chora-tadbirlar belgilangan. Biroq, bu jarayonda bir qator muammolar yuzaga kelmoqda. Ushbu ilmiy ishda mazkur muammolarni tahlil qilish va ularni bartaraf etish bo‘yicha takliflar ishlab chiqish maqsad qilingan.

Adabiyotlar sharhi. Erkin iqtisodiy zonalar (EIZ) iqtisodiy rivojlanishni tezlashtirish, investitsiyalarni jalb qilish va yangi ish o‘rinlarini yaratish uchun samarali vosita hisoblanadi. Biroq ularning samarali faoliyat yuritishi uchun

infratuzilma, qonunchilik, byurokratik to‘siqlar va investitsiya muhitining holati kabi omillar muhim ahamiyatga ega.

Erkin iqtisodiy zonalarning har xil turlari mavjud: erkin omborxonalar, erkin bojxona zonalari, ilmiy texnika zonalari. Ular AQShda texnoparklar, Yaponiyada texnopolislar deb ataladi. Shuningdek, maxsus iqtisodiy zonalar (asosan, eksportga ixtisoslashgan) ham mavjud. Dastlabki Erkin iqtisodiy zonalardan biri Irlandiyada „Shennon“ aeroportida (1959) tashkil etilgan edi. Keyinroq shunday zona Angliyadagi „DogAylend“ aeroportida paydo bo‘ldi. Ba’zi Erkin iqtisodiy zonalar ancha yirik hududlarda tashkil etiladi. Masalan Braziliyadagi Manaus, Xitoydagi maxsus iqtisodiy hudud „Shenjen“ va boshqalar shunday zonalardir.[8] “EIZlarda foyda me’yori o‘rtacha 25-30 %ni, Osiyodagi EIZlarda 35-40 %dan yuqorini tashkil etadi. Mazkur hududlarda kapital qo‘yilmalarning qoplanish muddati 2-3 martaga qisqa hisoblanadi. Odatda, kiritilgan mablag‘lar 3-3,5 yilda qoplansa, bunday qo‘yilma meyordagi hisoblanadi. Ko‘pgina rivojlanayotgan mamlakatlarda EIZlar orqali ular iqtisodiyotiga jami xorijiy investitsiyalarning 30 %dan 80 %gacha qismi kirib keladi”[6].

Tadqiqot metodologiyasi.

Tadqiqotda sifatli va miqdoriy tadqiqot usullari qo‘llanilgan. Qashqadaryo viloyatidagi mavjud erkin iqtisodiy zonalar faoliyati o‘rganilib, mavjud muammolar aniqlangan. Shuningdek, xalqaro tajribalar tahlil qilinib, ularni Qashqadaryo viloyatida qo‘llash imkoniyatlari baholangan.

Qashqadaryo viloyatida dastlabki erkin iqtisodiy zona ya’ni "Chiroqchi" erkin iqtisodiy zonasi tashkil etish bo‘yicha loyiha va takliflar o’rganildi va ushbu zona viloyatning ishlab chiqarish va resurs salohiyatini kompleks rivojlantirish, mineral xom ashyo va qishloq xo‘jaligi resurslarini chuqur qayta ishlash bo‘yicha yuqori texnologik va eksportbop mahsulot ishlab chiqarishni tashkil etishga qaratilgan. Biroq, zona faoliyatini samarali tashkil etishda infratuzilma, byurokratik to‘siqlar va investitsiya muhitining holati kabi muammolar mavjudligiga qaramay ushbu hududda EIZ tashkil qilindi.

Muammolar tahlili

Erkin iqtisodiy zonalarni tashkil etish uchun birqancha muommolarni bartaraf etish lozim va ushbu muommolarga quyidagi omillarni kiritishimiz mumkun:

Erkin iqtisodiy zonalarda samarali faoliyat yuritish uchun zarur infratuzilma mavjud emasligi kuzatilmoqda. Elektr energiyasi, tabiiy gaz, suv va boshqa kommunikatsiya tarmoqlari bilan barqaror ta’minlashda muammolar mavjud.

Erkin iqtisodiy zonalarda faoliyat yurituvchi tadbirkorlar ma’muriy-buyruqbozlik va qog‘ozbozlikdan holi emas. Bu esa investitsiya muhitini salbiy ta’sir ko‘rsatmoqda.

Xorijiy investitsiyalarni jalb qilishda mavjud qonunchilik va amaliyotdagi kamchiliklar, shuningdek, byurokratik to‘siqlar mavjud.

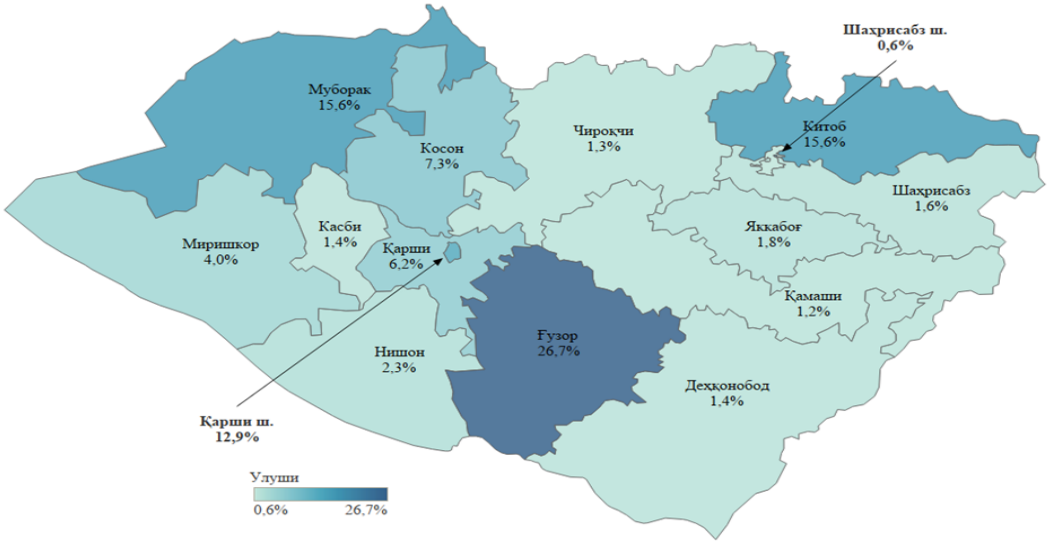
Xalqaro tajribalar shuni ko‘rsatadiki, erkin iqtisodiy zonalarni samarali tashkil etish uchun quyidagi omillar muhim ahamiyatga ega:

Infratuzilma rivoji: Erkin iqtisodiy zonalarda zarur infratuzilma mavjud bo‘lishi kerak.

Qonunchilik bazasi: Erkin iqtisodiy zonalarga oid aniq va barqaror qonunchilik bazasi yaratilishi zarur.

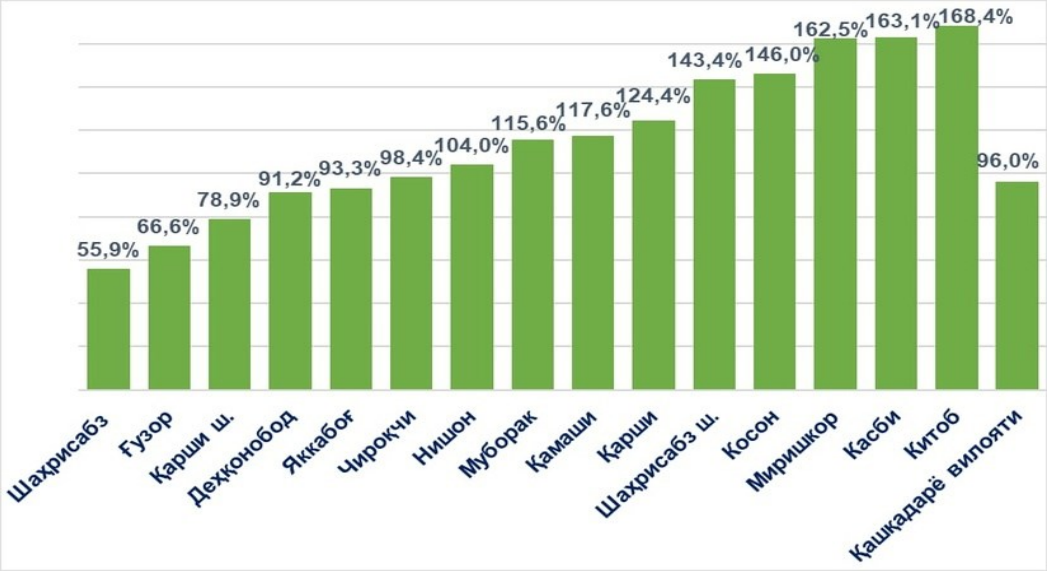
Byurokratik to‘siqlarni bartaraf etish: Ma’muriy-buyruqbozlik va qog‘ozbozlikni kamaytirish lozim.

Investitsiya muhitini yaxshilash: Xorijiy investitsiyalarni jalb qilish uchun qulay sharoitlar yaratish zarur.



1-rasm. Qashqadaryo viloyati bo‘yicha asosiy kapitalga kiritilgan investitsiyalar hajmida tuman (shahar)lar ulushi (%da) (2022-y).[7]

Viloyatda investitsiyalar o‘zlashtirilishida keskin differensiallik saqlanib qolgan. Xususan, kiritilgan investitsiyalarning 70,8 foizi viloyatning 4 ta hududi - G‘uzor tumani (26,7 %), Muborak tumani (15,6 %), Kitob tumani (15,6 %) va Qarshi shahri (12,9 %) hissasiga to‘g‘ri kelgan. Aksincha, Yakkabog‘ tumani (1,8 %), Shahrisabz tumani (1,6 %), Dehqonobod tumani (1,4 %), Kasbi tumani (1,4 %), Chiroqchi tumani (1,3 %), Qamashi tumani (1,2 %) va Shahrisabz shahri (0,6%) ga investitsiyalar oqimining pastligi kuzatilgan.



2-rasm. Qashqadaryo viloyatining 2022 yil yanvar-sentyabr oylaridagi investitsiya ko‘rsatkichlari dinamikasi

Takliflar

Barchamizga ma’lumki, chetdan kapital mablag‘lar qanchalik ko‘p kirsa bu hududning iqtisodiy salohiyati ham tezda yuksala boradi. Mavzu doirasida viloyatda to‘laqonli EIZ tashkil qilish uchun kompleks yondashmoq darkor, binobarin tanlangan hududning rivojlangan shahar yoki katta magistral yo‘llar bilan chegaradoshligi va aynan mehnat resurslar bilan yaxshi ta’minlangan bo‘lishi kerak, yuqoridagi talablarga viloyatning ko‘pgina tumanlari mos keladi, ammo tabiiy sharoit borasida esa birqancha muommolar yuzaga kelishini ko‘rishimiz mumkin. EIZlar uchun bir qancha yirik korxonalar qurish lozim bo‘ladi va eng dolzarb resurs bo‘lgan suv tanqisligi bo‘lmasligi kerak, tahlillarimizga ko‘ra bu muommoga duch kelmaslik uchun Kitob va Shahrisabz tumanlari eng ma’qul hududlar hisoblanadi , misol qilib aytadigan bo‘lsak birgina Kitob tumaning o‘zida 2022-yil 1-fevral holati bo‘yicha tumanda ro‘yxatdan o‘tgan korxona va tashkilotlar soni 2710 tani tashkil etgan [7]. Shuningdek tuman viloyat miqyosida transport sohasida yuqori o‘rinlardan joy olgan, masalan, 2022-yil hisobiga ko‘ra viloyatda tashilgan yuk aylanmasi umumiy hajmining 8,5 foizini (128,2 mln.tonna) tashkil etib, Qarshi shahridan so‘ng ikkinchi o‘rinni egallaydi[9].

Ayni shu hududni hukumat tomonidan xo‘jalik va tashqi iqtisodiy faoliyat bilan shug‘ullanish uchun imtiyozli soliq, moliya, huquqiy sharoitlar joriy qilinadigan makon sifatida ko‘rish mumkin. Xorijiy va mahalliy tadbirkorlarni jalb etish maqsadlarida zarur ishlab chiqarish va ish yuritish infratuzilmasi barpo etilsa bu hududdan jahon bozoriga mahsulotlar chiqarish va eng muhumi yurtimiz iqtisodiyotiga katta mablag‘lar kiritish imkoni yaratiladi.

Tumanda to‘laqonli jahon bozoriga raqobatdosh mahsulotlar yetqazi beraoladigan erkin iqtisodiy zonalar yaratish uchun to‘siq bo‘la oladigan qator muommolar mavjud, misol tariqasida quyidagilarni ko‘rsata olamiz.

Infratuzilmani rivojlantirish: Erkin iqtisodiy zonalarda zarur infratuzilma, jumladan, xizmat ko‘rsatish sohasidagi ishlab chiqarish infratuzilmasi (yuk tashish transporti, elektr va issiqlik ta’minoti, yo‘l xo‘jaligi, suv xo‘jaligi, ombor xo‘jaligi, ilmiy konstruktorlik xizmati, axborot xizmati va boshqalar) va ijtimoiy-maishiy infratuzilma (maorif, sog‘liqni saqlash, jismoniy tarbiya va sport, maishiy xizmat va boshqalar)ni rivojlantirish lozim.

Qonunchilikni takomillashtirish: Erkin iqtisodiy zonalarga oid qonunchilikni takomillashtirish va uni barqarorlashtirish zarur.

Byurokratik to‘siqlarni bartaraf etish: Ma’muriy-buyruqbozlik va qog‘ozbozlikni kamaytirish uchun elektron xizmatlar va raqamli texnologiyalarni joriy etish lozim.

Investitsiya muhitini yaxshilash: Xorijiy investitsiyalarni jalb qilish uchun soliq imtiyozlari, bojxona imtiyozlari va boshqa rag‘batlantirish chora-tadbirlarini ko‘rish zarur.

Xulosa

Qashqadaryo viloyatida erkin iqtisodiy zonalarni samarali tashkil etish va rivojlantirish uchun infratuzilma, qonunchilik, byurokratik to‘siqlar va investitsiya muhitining holatini yaxshilash zarur. Xalqaro tajribalar asosida taklif etilgan chora-tadbirlarni amalga oshirish orqali viloyatda erkin iqtisodiy zonalarning samarali faoliyatini ta’minlash mumkin. Ko‘rsatilgan hududda barcha amaliyotlar (yer ajratish, firma va kompaniyalarni tashkil etish, chegaradan yuklarni, tovarlarni olib kirish va olib chiqish, boj to‘lovlari, soliq to‘lovlari bo‘yicha imtiyozlar, qaysi valyuta yoki valyutalar to‘lov vositasini o‘tashi, hududni boshqarish tartibi va boshqalar) qabul qilingan qoidalar asosida tezkorlik bilan bajarilgan holatdagina erkin iqtisodiy zonalar barpo bo‘ladi.

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TARIX FANINI O‘RGANISHDA TANGALARNING AHAMIYATI (TOSHKENT VILOYATI PARKENT TUMANI MISOLIDA)

Annotatsiya: *Ushbu maqolada tangalarning tarix fanidagi ahamiyati xususida boradi. Toshkent viloyati Parkent tumanidan topib o‘rganilgan tangalarning tumanning tarixini yoritishdagi ahamiyati haqida dalillar yordamida bildirilgan fikr mulohazalarni ham o‘z ichiga oladi.*

Kalit so‘zlar*: tanga, avers, revers, Sanganak, Xo‘ja, Dilmurod Normurodov, Boysung‘ur Mirzo*

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THE IMPORTANCE OF COINS IN THE STUDY OF HISTORY (ON THE EXAMPLE OF PARKENT DISTRICT OF TASHKENT REGION)

Abstract*: This article discusses the importance of coins in history. It also includes arguments about the importance of coins found and studied in the Parkent district of Tashkent region in shedding light on the history of the district.*

Keywords*: coin, obverse, reverse, Sanganak, Khoja, Dilmurod Normurodov, Boysunkur Mirzo*

Kirish. Tarix fani dalillar va faktlarga asoslanadi, shuningdek, tarixchining xolis va asosli fikrlari ham tarixiy jarayonlarni qayta tiklashga yordam beradi. Turli qo‘lyozmalar va tarixiy ashyolarni soha mutaxassislari har tomonlama o‘rganishadi hamda ular asosida xulosalar berishadi. Bu tarixiy manbalarni tarixiy dalillar deb ham atash mumkin. Ularni asosan 2 guruhga bo‘lish mumkin:moddiy va yozma manbalar.

Ayrim tarixchilar xalq og‘zaki ijodi manbalarni ham uchinchi tur sifatida ta'kidlashadi. Ammo aksariyat og‘zaki manbalar bugungi kungacha yozma manbalar orqali yetib kelganligi uchun alohida turga ajratmaslik ham xato bo‘lmaydi.

Shunday tarixiy manbalar borki, u o‘z o‘rnida ham moddiy, ham yozma manba sifatida e’tirof etiladi. Ushbu manba - qadimiy tangalardir. Uning moddiy manba sifatida e’tirof etilishining bosh sababi, tangalarning aksariyati qimmatbaho metallar va ularning aralashmalaridan tayyorlanganligidadir.Insoniyat tarixi va madaniyatini o‘rganishda tangalarning ahamiyati katta. Chunki ulardan olinadigan ma’lumotlar shunchalik ko‘p qirraliki, ularning hammasini hattoki qayd qilib

chiqish qiyin. Xususan, tangalar tarix, siyosat, iqtisod, san'atshunoslik, ideologiya, til, me'morchilik, savdo, xalqaro aloqalar vujudga kelishi bilan bog'liq bo'lgan bir qancha muammolarni yechishda moddiy manbalar orasida muhim rol o'ynaydi. Tangalar bo'lib o'tgan tarixiy voqealarning sanasi, qanday shohlar hukmronlik qilganligini, ularning hukmronligi necha yil davom etganligini, davlat chegaralarini aniqlashda, tabiat, qishloq xo'jaligi, qadimgi metallurgiya, qurol-yarog'lar tarixini, kiyim-bosh formalarini o'rganishda ham katta ahamiyatga ega [54].

Shu o'rinda asosli savol tug'iladi: Xo'sh bu tangalar qachon vujudga keldi? Xalq ommasiga qachon keng tarqaldi?

Tanga pullar qadimiy davrlarda, ya'ni mehnat taqsimoti paydo bo'lib, ishlab chiqarish ancha rivojlangan, ishlab chiqargan mahsulotlari ishlab chiqaruvchining o'z ehtiyojidan ortib qolgan va uni boshqa mahsulotlar masalan, qishloq xo'jalik yoki qo'l hunarmandchilik mahsulotlari bilan almashtirish zaruriyati tug'ilgan bir davrda mollarning almashtirish ekvivalenti sifatida paydo bo'lgan[55].

Asosiy qism. Ta'kidlash joizki, o'z davrida muhim iqtisodiy va siyosiy vazifalarni bajargan tangalarning ahamiyati bugungi kunda ham juda yuqori. Misol uchun kichik bir tumanning tarixi yuzasidan tadqiqot ishi olib boriladigan bo'lsa, tabiiyki, ashyoviy va yozma manbalarga tayaniladi. Yozma manbalarning o'sha tuman uchun eng ahamiyatlisi aynan o'rganilayotgan davrda yozilgan kitob bo'lsa, ashyoviy manbalar orasida eng ahamiyatli manbalardan biri bu - tangalardir. Chunki tangalar ma'lum bir davrda mavjud bo'lgan savdo-iqtisodiy munosabatlar bilan bir qatorda, o'rganilayotgan manzilning qaysi davlat tarkibida bo'lganligi haqida ham ma'lumot beradi.

Misol uchun Toshkent viloyatida joylashgan Parkent tumanini olaylik. Parkent tumanida ham hayot izlari ancha qadimga borib taqaladi. Olimlarning aniqlashicha, paleolit davrilaridayoq tumanning bir qancha tog' va tog'oldi hududlarini o'zlariga makon qilishgan.

Davrlar o'tib, so'z yuritilayotgan hududda rivojlangan sivilizatsiya kirib borib shaharlashuv yuz beradi va tuman hududi o'z navbatida ma'lum bir davlatning tarkibiy qismiga aylanib boradi. Masalan, ayrim tarixchilar Qang' davlatining yozgi poytaxtini Parkent tumanining So'qoq qishlog'iga to'g'ri kelishi mumkinligini taxmin qilishgan. Albatta, o'z davrining yozma manbalari asosida turli taxminlar va xulosalar berishimiz mumkin. Ammo arxeologik manbalar, xususan, tangalar ushbu taxminiy xuloslarimizni aniqlshtirishga yordam beradi. Ya'ni, tumandan qachonki moddiy yoki ashyoviy manbalar, ayniqsa muhr va tangalar topib o'rganilsa, tarixiy taxminni aniq xulosaga aylantirish mumkin.

Bugungi kungacha tumandan qadimgi davrga oid topib o'rganilmagan. Ammo o'rta asrlarga oid bir qancha tangalar topib o'rganilgan. Bu tangalar temuriylar va shayboniylar davriga oid tangalar deb taxmin qilinadi. Xususan, 2021-

[54] Sh. Pidayev. Tangalar davr ko'zgusi. T.: "O'zbekiston" 1984. B.3
[55] I. To'xtiyev Tangalar tilga kirganda. T.: "Fan" 1989. B.3

yil tumanning Sanganak qishlog‘idan mis tangalar topilganligi jamoatchilik e’tiboriga ma’lum qilindi.

Fanlar Akademiyasi axborot xizmatining Kun.uz’ga ma’lum qilishicha, Parkent tumani Yangi Sanganak mahallasida yashovchi Imomali Boymaqov hovlisida limon uchun issiqxona tayyorlayotganda, tuproqlar orasidan ichiga mis tangalar solingan sopol ko‘zaga duch kelgan. Fuqaro 2021 yilning 11 mart kuni tangalar haqida Temuriylar tarixi davlat muzeyiga xabar bergan [56].

Tangalarni o‘rganish uchun Temuriylar tarixi davlat muzeyi katta ilmiy xodimi Dilmurod Normurodov jalb etiladi.

(**1-rasm**. XVI-XVII asrlarga oid deb tahmin qilingan tanga)[57]

Tanganing old tomoni: qavariq shakldagi 2 qatorli to‘rtta to‘rtburchakning bir-biriga tutashishi natijasida hosil bo‘lgan kvadratli hoshiya-bezak ichiga arab harflaridagi zarb Samarqand (ضرب سمرقند – Samarqandda zarb qilingan) so‘zi tushirilgan.

Tanganing orqa tomoni: qavariq halqa ichidagi arab harflari ustidan qayta zarb urilgan[58].

D.Normurodovning xulosalariga ko‘ra, ushbu tangaga o‘xshash tangalar XV asr oxirida temuriylar davrida Samarqand va Buxoro shaharlarida ham zarb ettirilgan. Tangada hukmdor nomining ko‘rsatilmaganligi XV asr oxiridagi Movarounnahrdagi siyosiy vaziyatning barqaror bo‘lmaganligi bilan izohlandi.

Mazkur tangalar tumanning temuriylar davri iqtisodiy hayotidagi o‘rni haqida xulosa berishimizga yordam beradi. Sababi, temuriylarning muhim savdo-iqtisodiy markazlarida zarb etilgan tanga namunalarining tumandan topilishi, o‘z navbatida Parkent tumanining ham bevostita iqtisodiy muhim zona bo‘lganligini ko‘rstadi..

Yana bir xabarga binoan O’zbekiston Respublikasi Fanlar akademiyasi Milliy arxeologiya markazi katta ilmiy xodimi Dilmurod Normurodov va Madaniy meros agentligi bosh arxeologi, Arxeologik tadqiqotlarni muvafiqlashtirish va

[56] https://kun.uz/53552762?q=%2Fuz%2F53552762
[57] Manba:Kun.uz sayti
[58] https://academy.uz/uz/news/parkentdan-xvi-asrning-oxiri-xvii-asrning-boshlarigna-oid-xazina-topildi

arxeologiya ashyolari davlat katalogini yuritish boshqarmasi boshlig'i Alisher Yarqulovlar hamda tangalar mahalla raisi, mahalla proflaktika noziri, uy egalari va arxeolog guvohligida sanoqdan o'tkazilib ularning soni 939 ta ekanligi aniqlandi. Ular o'rganish va davlatga topshirish uchun olindi[59].

Tozalangan tangalardan ayrimlarining bir tomonida "zarb Toshkent ( )" yozuvigina o'qildi. Ikkinchi tomonini o'qishning imkoni bo'lmadi. Ammo, avvallari aniqlangan, aynan ularga o'xshash tangalar bilan qiyosiy tahlil yangi topilgan xazinaning XVI asrning oxiri – XVII asrning boshlariga tegishli ekanligini ko'rsatdi[60].

Ushbu davrda o'lkada shayboniylar hukmronlik qilgan davr ekanligini inobatga olsak, bu tangalarni shu sulola vakillari zarb etgan degan tahminni ham ilgari surish mumkin.

Xulosa. Umuman olganda, tangalar o'z davrida davlatning va hukumatning mavjudligini va o'rni kelganda, uning qudratidan ham darak bergan. Zarbxonalar ham o'z davrining eng rivojlanga shaharlaridagina mavjud bo'lgan. Har bir davlatning asosiy tayanchi iqtisodiyot bo'lsa, iqyisodiyotning asosiy tayanchi tovar-pul munosabatlari hisoblangan.

Parkent tumanida topilgan tangalar ham tumanning :

birinchidan, siyosiy jihatdan qaysi davlat tarkibida ekanligidan dalolat bersa,

ikkinchidan, aholining ijtimoiy-iqtisodiy hayotidan ham darak beradi.

Binobarin, tangalar tumanning temuriylar davlatining bir qismi bo'lganligini arxeologik yo'l bilan isbotlash bilan bir qatorda, tumanning qadimgi aholisining ijtimoiy holati ancha barqaror bo'lganligini ham amalda ko'rsatib berdi. Sababi, har ikki holatda ham tumandan kumush tangalar ko'proq miqdorda topilgan. Va kumush tangalar aholining boy va kambag'al qatlam oralig'idagi qatlam vakillarida muomilada bo'lgan. Aksariyat kundalik turmush tarzida oltin tangalar ishlatilinmaganligini ham e'tiborga olish zarur.

Tumanning boy qadimiy tarixi borligi barchamizga ma'lum. Bu hududda paleolit davridan boshlab insoniyatning ajdodlari yashaganligini inobatga olib, eng qadimgi davr, antik va ilk o'rta sarlar davriga oid tangalar ham topib, o'rganilishiga ishonch bildiramiz.

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THE RELEVANCE OF TEACHING COMPUTER SCIENCE AND FACING PROBLEMS

Abstract: *In the era of technology, every young generation must not only use modern tools but also be able to manage and work effectively with them. Along with developing thinking and creative abilities, it is essential to enrich their knowledge of the digital world. This article discusses the relevance of teaching informatics and computer science in schools today and sheds light on the challenges currently faced in the process.*

Keywords: *Informatics, computer science, school education, digital literacy, informatics teachers, modern technologies, coding, STEM education.*

Introduction

Today, the field of computer science is one of the fastest-growing and highest-paying professions in the world. Moreover, by the 21st century, technology has become an integral part of every aspect of our lives. Regardless of which corner of the world we go to, it is almost impossible to find a place untouched by technology. This is especially evident in developed countries, where modern technologies have significantly simplified daily life. Intellectual labor is now considered more valuable than physical labor.

However, if we look at the statistics, we observe a decline in students' interest in computer science. Nevertheless, mastering this subject has become a necessity of the time. Even for students who are not particularly interested in the field of computer science, studying informatics is beneficial. With the growth of the digital era, there is a growing need for logical thinking, computational skills, and problem-solving abilities. Regardless of the career path, whether it be creating a file, preparing a report, or presenting a topic, knowledge of computer science has become essential.

When informatics was first introduced in schools, it was often regarded as mere computer literacy and was considered uninteresting or unimportant by many students. However, today, the role of an informatics teacher is seen as one of the most challenging and responsible professions. Considering the increasing demand for skilled professionals with informatics knowledge and the growing number of job opportunities in the field, it is clear that informatics is becoming a vital tool for driving global innovation.

Computer science is a discipline that encompasses the theoretical and practical knowledge used by computer specialists in their work. As an academic

field, it includes a broad range of topics—from the theoretical study of algorithms and computational limits to the practical implementation of computing systems in both hardware and software domains. [1]

Main body

Today, computer science, coding, and digital literacy are increasingly being recognized as essential subjects in schools—on par with english and mathematics. These subjects should be introduced early, even at the preschool level. For example, in israel, children learn to code from a young age, shaping their mindset and helping them better understand the world.

Research from maryland, usa, shows that high school students who take quality computer science courses are 10% more likely to pursue related careers. According to lightcast™, jobs in computer science are projected to grow by 21% between 2023 and 2033—nearly double the growth rate for other bachelor-level jobs. So why doesn't everyone go into this field? The main reason is its difficulty. Computer science requires strong foundations in mathematics and the ability to adapt to constantly evolving technologies. It is essential for young people to use technology effectively—not just for entertainment, but as learning tools. To achieve this, schools must provide strong informatics education. This also supports social-emotional learning and helps students develop problem-solving and computational thinking skills like "sequencing," which are useful in many life areas.

However, informatics education faces major challenges: a shortage of qualified teachers, outdated textbooks, and limited computer access (often 2–4 students per device). Parents also need to understand its importance, as many still underestimate it. Meanwhile, new technologies like ai and cybersecurity require updated curricula and better-trained teachers. Investing in teacher training, certifications, and project-based learning (such as app design or robotics) can significantly boost student engagement. Addressing equity is crucial—many rural schools lack stable internet or modern tools. Governments must close the digital divide, and public-private partnerships can help with resources and mentorship. Encouraging girls and underrepresented groups is also important. Early exposure and role models reduce gender and racial gaps in stem. Schools can organize coding clubs, mentorship programs, and awareness campaigns to inspire all students.

Finally, the perception of computer science must change. It should not be seen as optional or niche, but as a core subject essential for navigating today's digital world. From healthcare to finance and education, every field relies on technology. Teaching students to become creators—not just consumers—of technology prepares them for future careers.

In conclusion, making computer science a standard part of school curricula is not just an education reform—it is an investment in a country's digital future.

Conclusion

In today's digital era, where the study and teaching of computer science have become essential, the primary task is to eliminate the existing challenges in this field. In many cases, the teaching of computer science should be integrated with game-based learning—similar to how other subjects are introduced—especially for

young learners. This means that teachers must be well-trained in playful teaching methods and encouraged to organize subject-specific competitions and olympiads to increase engagement. Additionally, schools should focus more on hands-on learning activities. While theoretical knowledge is important, practical application is critical in the field of computer science.

Furthermore, parental involvement is also essential. Parents must support their children at home and encourage them to actively engage with computer science. Only through a collective effort between educators, students, and parents can we prepare future generations for a technology-driven world.

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NATURAL RADIATION SOURCES AND RULES FOR LIVING WITH THEM

Annotation. *The effect of radiation on living nature is associated with damage to the living organism and damage to the genetic apparatus. Radiation enters the human body through the consumption of plant and animal products that contain various types of radiation. Radionuclides can accumulate mainly in different parts of the human body - thyroid, liver, bone and muscle tissue.*

Key words: *radionuclide, radiation effect, somatic effects, genetic effects, radioactive element, human organism.*

There are finite difference (deterministic) and stochastic effects. The first occurs when the number of cells that die as a result of radiation, lose their ability to reproduce or function normally, reaches a critical value, and the functions of the affected organs are significantly impaired. Table 2 shows that the function of the affected organs depends on the severity of the disorder and the size of the radiation dose [3].

The effects of radiation on humans are generally divided into two categories. These are:

1) Somatic (bodily) - appears in the body of a person exposed to radiation.

2) Genetic - is associated with damage to the genetic apparatus, manifested in subsequent generations: these are manifested in the children, grandchildren and more distant descendants of the person exposed to radiation [1,2].

1 Table.

Effects of different doses of radiation on the human body	
Dose (amount of radiation) , Gr	Cause and effect of radiation exposure
(0.7 - 2) 10^{-3}	Annual dose from natural sources
0.05	The maximum permissible dose of occupational radiation per year
0.1	A doubling of the probability of a gene mutation
0.25	A single dose of reasonable risk in an emergency
1.0	A dose that causes acute radiation sickness

3-5	Without treatment, 50% of those affected will die within 1-2 months due to impaired bone marrow cell function.
10 - 50	Death occurs within 1-2 weeks, mainly due to damage to the gastrointestinal tract.
100	Death occurs after a few hours or days due to damage to the central nervous system

The whole population includes not only general healthy working employees, but also all people (children, elderly, etc.) Cosmic of rays intensity of the earth magnet area is also affected does North and southern poles the equator regions than more radiation takes Sea level medium in widths space of rays equivalent dose 4-5 km high space of rays about 10 % organize does Contemporary of airplanes height in flights space radiation the sea from the level one how many ten even high will be (Fig. 1). But, from the sound fast flying on airplanes flight during of speed significant difference because of passenger less to radiation subject [4].

Radionuclides accumulate unevenly in organs. In the process of metabolism in the human body, they exchange atoms of stable elements in various cell structures, biologically active compounds, which leads to high local doses [5-8].

The effect of radiation exposure can manifest itself in a completely different place exposed to radiation. Exceeding the dose of radiation causes the body's immunity to decrease and makes it prone to various diseases. Radiation also increases the likelihood of malignant tumors [9].

Radionuclides enter the body (respiratory and digestive organs), the most strongly irradiated organs, as well as the thyroid gland and liver. The doses absorbed in them are 1-3 times higher than in other organs and tissues. According to the ability to concentrate absorbed decomposition products, the main organs can be placed in the following order [10]:

thyroid > liver > skeleton > muscles

Thus, up to 30% of absorbed decay products, mainly radioisotopes of iodine, accumulate in the thyroid gland.

According to the concentration of radionuclides, the second place after the thyroid gland is the liver. The radiation dose received by this organ mainly depends on ^{99}Mo , ^{132}Te, ^{131}I, ^{132}I, ^{140}B a , ^{140}L a radionuclides [11].

In conclusion, we can say that various radionuclides accumulate in different parts of the human body. Radionuclides accumulate mostly in the thyroid gland, liver, bones and muscles of the human body. Radionuclides enter the body mainly through consumption of irradiated plant and animal products. Changes and swellings appear in different parts of the body under the influence of radiation. Under the influence of this, the immunity of a person decreases, which leads to the appearance of various diseases, including thyroid cancer and breast cancer.

Iodine isotopes deserve special attention among man-made radionuclides. They have high biological activity, are able to actively participate in the biological cycle and move along biological chains, one of whose links can be a person.

In recent years, the processes of interaction of ionizing radiation with tissues of the human body have been studied in detail. As a result, radiation safety standards

are being developed that reflect the actual radiation effects in terms of harm to human health.

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DISTRIBUTION AND CONTROL OF RADIATION FLUXES IN THE NATURAL ENVIRONMENT

Annotation. *All living organisms develop under the constant influence of natural radiation, and radiation plays an important role in the vital activity of living organisms. The natural background of radiation (the amount of radiation in nature) is an integral factor of the environment, such as gravity and electromagnetic fields. In addition, the quantitative value of radiation varies significantly in different parts of the world.*

Keywords: *Natural radiation background, radionuclide, uranium, radon, cosmogenic radionuclides, emanation.*

Galactic space rays interstellar from the environment when passed harvest will be Theirs average age 10^{6} -10^{7} year Such long process different from sources coming space of rays to interfere possibility gives, of this as a result radiation isotropic will be Cosmic rays Earth atmosphere enter, own contained light element nuclei and protons land atmosphere the air atoms nuclei with will collide and slows down. As a result primary space rays almost the sea to the level reached doesn't go However, this collisions land to the surface reached going collision from energy come next nuclear changes cascade because of secondary space radiation cause emits [2].

Natural radiation background land on the surface and in the depths, in the atmosphere, all alive of beings in organisms and in plants spread out is radiation space rays under the influence of and land of the shell radionuclides by is created . Natural radiation sources by created of radiation less part space to the rays right will come. Primary and secondary space radiations from each other are different.

Primary space radiation-interstellar from space straight away land atmosphere entering high energetic particles is the flow. Primary space of radiations most of them our in our galaxy star explosions and very new of the stars appear to be on time of matter eruption and radiation as a result appear will be Such galactic space of particles energy the sun flashes as a result appear to be of particles from energy much high will be [1,2,6-9]. Contains according to such of radiation almost 90% - ini protons, about 7 % α- particles, about 1 % neutrons , photons , electrons and light element nuclei organize does [1].

Sea 45 km above sea level space rays basically primary from the rays organize finds 20-25 km high secondary space of rays maximum intensity observed, secondary space rays energy of height decline with decreases and the sea level to a minimum is enough Tall mountainous regions population of space of rays to the greatest effect subject to will be [3] .

Theirs each in one initial radionuclide and final decay product (usually of lead

stable of isotopes one) exists will be Har all three in the family decay from products one gas (from radon isotopes one) is called emanation. Emanation in the air , in the water and in the soil significant amount decay of products to existence take will come . Uranium-radium in the family initial nuclide ^{238} U, final decay product ^{206} Pb and emanation of radon ^{222} Rn isotope belongs.

Cosmic of rays intensity of the earth magnet area is also affected does North and southern poles the equator regions than more radiation takes Sea level medium in widths space of rays equivalent dose 4-5 km high space of rays about 10 % organize does Contemporary of airplanes height in flights space radiation the sea from the level one how many ten even high will be (Fig. 1). But, from the sound fast flying on airplanes flight during of speed significant difference because of passenger less to radiation subject to will be [4].

Earth of the shell radionuclides are both terrestrial and cosmogenic come exit can On the ground face giving natural radionuclides radioactive to families belongs to radionuclides and DI Mendeleev elements periodic of the system medium part of the elements to radionuclides is divided. Everything being in nature three radioactive family available: uranium-radium thorium and actinium [5]. of families each one radionuclides the chain harvest does then it is a nuclide of the previous one decay to the product becomes [6].

Thorium of the family initial nuclear ^{232} Th, final decay product ^{208} Pb and emanation thoron ^{220} to the Rn isotope belongs to will be Actinium of the family initial nuclear ^{235} U, final decay product ^{207} Pb and emanation action ^{119} Rn isotope belongs to will be Radon is his radioactive decay products with together population by land over radiation from sources removable annual individual equivalent radiation of the dose to about ¾ and all natural radiation from sources received dose by half right will come . Radon radioactive effect its α- radioactivity and radioactive volatile didn't happen decay products - Po, Bi and Pb with depends they are very difficulty with from the body is issued. breath get for biological dangerous isotope ^{218} Po is his decay product a- active isotopes and decay last product is lead [7].

But medicine and bolneology (bolneology this of cardiology one department of mineral waters come exit and physicist chemical properties , patients treatment and prevention in order to external and internal in use apply methods , of them to use medical instructions teaches), nerve and heart blood vein systems , breathing get and food digestion to do bodies , support movement system , gynecological diseases and metabolic diseases in the treatment of radon air , radon water and mud baths as well the air inhalation and emanation radon is wide in form used [8].

DI Mendeleev elements periodic of the system medium such as: 40 ^{K} , ^{48} Ca, ^{87} Rb, ^{96} Zr, ^{115} In, ^{138} La, ^{142} Ce, ^{144} Nd, ^{149} Nd, ^{147} Sm, ^{176} Lu radionuclides on our planet happen has been primary radiations harvest 12 elements that do own into takes [9].

Cosmogenic radionuclides basically space of radiation the atmosphere organize doer atoms nuclei with mutually effect as a result harvest will be Cosmogenic of radionuclides small one part space of radiation of the earth on the surface located atomic nuclei with mutually under the influence of harvest will be

In general in fact , cosmogenic radionuclides emits radiation natural radiation sources to radiations irrelevant contribution they add On the ground background radiation level basically two radioactive family: earth of the shell natural radionuclides ^{40}K, ^{97}Rb and uranium-radium-thorium at the expense of is formed . of these elements concentration different in places changed stands and therefore for on the ground background radiation the level also changes. This is the population point sands rich in thorium on located in Iran radium- rich springs flowing Ramser city in the area 400 mSv per year until radiation level note done [10].

Summary by doing in other words , radiation in nature occurring different radioactive of the elements harvest to be radiations and space rays under the influence of harvest will be Radiation everyone in the place in air , water , soil and in the mountains there is will be Radiation of the earth different in places differently will be , so places there is radiation very high will be Cosmic rays under the influence of radiation harvest to be to the equator relatively at the poles stronger will be , that is space rays to the equator relatively to the poles more falls However natural of radiation space rays in effect harvest to be not worth it part organize.

On the ground so places they have of the earth radiation level background from radiation much high will be Such from places one of Brazil Pocos de Caldas city nearby is located is there radiation level average 800 barabar from the indicator high and 250 mSv per year to enough.

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QAYTA TIKLANUVCHI ENERGIYA MANBALARINING SANOAT TARMOQLARIDA QO‘LLANISH ISTIQBOLLARI

Annotatsiya: *Muqobil energiya olishning asosiy usullari energiya manbalari sifatida mustaqil bino va inshootlardan foydalanish imkoniyati nuqtai nazaridan ko'rib chiqiladi. Turli xil muqobil energiya manbalari tomonidan elektr energiyasini ishlab chiqarish xarajatlari to'g'risidagi ma'lumotlar keltirilgan. Muqobil energiya manbalarini almashish bo'yicha tavsiyalar berilgan.*

Kalit so'zlar: *Muqobil energiya, shamol generatori, gelioenergetika, quyosh kollektori, atrof-muhitni muhofaza qilish.*

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PROSPECTS FOR THE APPLICATION OF RENEWABLE ENERGY SOURCES IN INDUSTRIAL SECTORS

Abstract: *The main methods of obtaining alternative energy are considered from the point of view of the possibility of using independent buildings and structures as energy sources. Data on the costs of electricity production by various alternative energy sources are presented. Recommendations on the joint use of alternative energy sources are given.*

Keywords: *Alternative energy, wind turbine, solar energy, solar collector, environmental protection.*

Elektr energiyasiga bo‘lgan talab kundan-kunga ortib bormoqda. Shu bilan bir qatorda elektr energiyasini uzatish, taqsimlash va ishlatish jarayonlaridagi energiya yuqotishlarni hisobga olish va uni kamaytirish borasida tinimsiz ilmiy va amaliy ishlar olib borilmoqda. Bu borada energiya iste’moli juda katta bo‘lgan har bir ishlab chiqarish korxonalarida reaktiv quvvatlarni kompensatsiyalovchi qurilmalar o‘rnatish zarurligini hukumatimiz tomonidan nazoratga olinganligi katta iqtisodiy samara beradi[1, 2, 3].

Ushbu ish mustaqil bino va inshootlarning elektr energiyasi manbai sifatida maishiy ehtiyojlar uchun kam quvvatli (10 kVtgacha) muqobil energiya (elektr, issiqlik va bio - yoki boshqa yoqilg‘i shaklida) olish usullarini ko‘rib chiqishga bag‘ishlangan.

Energiya olishning asosiy alternativ usullari orasida quyidagilarni ajratib ko‘rsatish mumkin:

- shamol energetikasi;

- gelioyenergetika;
- gidroyenergetika;
- bioyenergetika.

Shamol energetikasi - shamolning kinetik energiyasini elektr energiyasiga aylantirishga asoslangan energiya sanoati [4]. Energiyani konvertatsiya qilish, qoida tariqasida, shamol generatorlarining turli xil konstruksiyalari tomonidan amalga oshiriladi. Bugungi kunda bu muqobil energiyaning eng keng tarqalgan manbalaridan biri bo‘lib, turli manbalarga ko‘ra uning global elektr energiyasini ishlab chiqarishdagi ulushi 2% ga yetishi mumkin. Yevropa ittifoqining ba’zi mamlakatlarida shamol generatorlari yordamida ishlab chiqariladigan energiya ulushi 40% dan ortiq.

Shamol generatorining ishlashining asosiy sharti 3 m/s dan yuqori tezlikda harakatlanadigan havo massalarining mavjudligi, shuning uchun, qoida tariqasida, ularning joylashgan joyi qirg‘oq zonalari, tepaliklar, tokchalar (qirg‘oq zonasida joylashgan).

Zamonaviy shamol generatorlari balandligi 100 m dan oshishi mumkin va pichoqlarning diametri bir necha o‘n metrga yetadi. Nominal ish rejimlarida chiqish quvvati (shamol tezligi 10 m/s) 10 Mvtgacha yetadi.

Dizayn bo‘yicha shamol generatorlarini gorizontal va vertikalga bo‘lish mumkin. Ikkinchi tur yanada istiqbolli, chunki ushovqinsizroq va shamol massasi tezligiga nisbatan kamroq talabchan (1m/s dan), ammo bazi sabablarga ko‘ra shamol generatorlarining gorizontal konstruksiyalari ko‘proq tarqalgan. Vertikal shamol generatorlarining ishlash muddati 20 yilgacha bo‘lishi mumkin [5].

Shamol generatorlari yordamida olingan elektr energiyasining narxi an’anaviy energiya yordamida olingan elektr energiyasining narxi 1,5-2 so‘m/(kVt*soat) bilan taqqoslanadi..

Shamol generatorlarining kamchiliklari orasida shovqinning nisbatan yuqori darajasi (shamol generatorining rotori yaqinida 100 db gacha va 300 m masofada 45 db dan oshmasligi kerak), katta tebranish yuklari ham qayd etilishi kerak. Shu sababli, shamol generatorlarini turar-joy binolaridan 300 m dan kam bo‘lgan masofada o‘rnatish tavsiya etilmaydi.

Shamol energiyasidan foydalanishning yana bir usuli-bu bino va inshootlarni isitish uchun uni issiqlik energiyasiga aylantirish, bu yondashuv bilan shamol generatorining ulanish sxemasi va uni boshqarish ancha soddalashtirilgan hisoblanadi.

Shamol qurilmasining tuzilishi generator, generator joylashgan ustun, pichoqlar, batareyalar, inverterni o‘z ichiga oladi.

Gidroenergetika energiya ishlab chiqarish uchun harakatlanuvchi suv massalarining kinetik energiyasidan (to‘lqinlar, oqim to‘lqinlari, sharsharalar, okean, issiqlik energiyasidan foydalanish) foydalanadi. An’anaviy ravishda muqobil gidroyenergetikani to‘lqin va to‘lqinli elektr stansiyalari, mini - va mikro GES, sharshara elektr stansiyalariga bo‘lish mumkin.

To‘lqin energiyasidan foydalanuvchi gidroyelektr stansiyalar bugungi kunda eng ko‘p tarqalgan, to‘lqin balandligi 13 metrgacha bo‘lishi mumkin bo‘lgan katta

to‘lqin mavjud bo‘lgan joylarda qurilmoqda. Suv toshqini energiyasidan to‘g‘onlar o‘rnatish orqali foydalanish mumkin, bu ekologik jihatdan juda xavfsiz emas, shuningdek, to‘g‘onlarni ishlatmasdan dengiz tubidagi suv oqimlari bo‘lgan joylarda past tezlikli turbinalarni o‘rnatish orqali foydalanish mumkin. Bunday turbinalar dengiz florasi va faunasiga deyarli zarar etkazmaydi. Bugungi kunda suv toshqini elektr stansiyalarining quvvati bir necha yuz Mvtgacha bo‘lishi mumkin.

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To‘lqin energiyasidan foydalanish biroz murakkabroq va qimmatroq elektr energiyasini olish imkonini beradi. To‘lqinli gidroyelektrostansiya-bu dengiz tubiga biriktirilgan stasionar platforma bo‘lib, unga diametri bir necha metrgacha bo‘lgan katta suzgichlar qo‘llarga (shpallarga) o‘rnatiladi, ular dengiz to‘lqinlarida yuqoriga va pastga siljiydi, gidravlik silindrlar orqali elektr energiyasini ishlab chiqaruvchi generatorlarni boshqaradi. Bugungi kunda shu tarzda ishlab chiqarilgan elektr energiyasining nisbatan kichik miqdoriga qaramay, ushbu turdagi qayta tiklanadigan energiya manbalarining umumiy energiya potensiali deyarli cheksizdir.

Mini va mikroGES daryolar, kichik daryolar, sharsharalardagi suv massalarining kinetik energiyasidan foydalangan holda o‘z miqdorda, bir necha o‘nlab kVtgacha elektr energiyasini ishlab chiqarishga imkon beradi. Balandlik farqi 1,3 m dan va suv sarfi 1 m3/s mikroGES girdob prinsipiga ko‘ra 10 kVt / soatgacha elektr energiyasini olish imkonini beradi. Ular suv massalarining kinetik energiyasidan maksimal darajada foydalanishga imkon beradigan maxsus shakldagi pervanelli generatorlardan iborat [7].

Kichik gidroyenergetikaning asosiy afzalligi shundaki, u ob-havo sharoitlariga bog‘liq emas va yilning istalgan vaqtida elektroyenergetika ishlab chiqarishni barqaror ravishda ta’minlaydi [8].

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SHAMOL ENERGIYASIDAN FOYDALANGAN HOLDA ELEKTR ENERGIYASINI ISHLAB CHIQARISH TEXNOLOGIYALARI

Annotatsiya: *Barqaror bo‘lmagan bino va inshootlarni elektr energiyasi bilan ta’minlash uchun muqobil energiya manbalari sifatida quyosh energiyasi, shamol energetikasi va kichik gidroyenergetika eng mos keladi, muqobil energiyaning qolgan turlari katta miqdordagi elektr energiyasini ishlab chiqarishda eng samarali hisoblanadi.*

Kalit so'zlar: *Muqobil energiya, shamol generatori, gelioenergetika, quyosh kollektori, atrof-muhitni muhofaza qilish.*

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ELECTRICITY PRODUCTION TECHNOLOGIES USING WIND ENERGY

Abstract: *Data on the costs of electricity production by various alternative energy sources are presented. The main methods of obtaining alternative energy are considered from the point of view of the possibility of using independent buildings and structures as energy sources. Recommendations on the joint use of alternative energy sources are given.*

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Shamol qurilmasining tuzilishi generator, generator joylashgan ustun, pichoqlar, batareyalar, inverterni o‘z ichiga oladi.

10 kVtgacha bo‘lgan kam quvvatli shamol generatorlari ko‘pincha avtonomdir, ya’ni.energiya tarmoqlariga ulanmagan holda bo‘ladi. Bioyenergetika

Bugungi kunda chorvachilik chiqindilarini qayta ishlash orqali elektr energiyasini ishlab chiqarish texnologiyalari allaqachon keng qo‘llanilmoqda, Volga mintaqasida, shu jumladan 40 kVt dan 5 mvtgacha bo‘lgan qurilmalar mavjud. 1 kubometrning energiya samaradorligi biogaz (55-70 % - Ch4, 45-30 % - CO2) 6 kVt / soatgacha bo‘lishi mumkin va undan foydalanganda ichki yonish dvigatelining elektr energiyasini olish uchun energiyaning 45% elektr energiyasi va 55% issiqlik energiyasi shaklida chiqariladi. Biogazning hosildorligi 20 (qoramol go‘ngi) dan 600 gacha (pekmez) kamdan-kam hollarda 1 tonna substrat uchun 1300 kubometrni tashkil qiladi [9].

Yana bir yo‘nalish – biogazni CO2 dan tozalash orqali donni qayta ishlash

chiqindilaridan tayyor bioyoqilg‘ini, masalan, biometanni, mahalliy gazning analogini olish.

Ushbu texnologiyani rivojlantirishning navbatdagi bosqichi maishiy chiqindilarni qayta ishlash bilan bog‘liq bo‘lib, unda ikkita juda muhim vazifa hal

qilinadi, elektr energiyasini olish va maishiy va sanoat chiqindilarini xavfsiz yo‘q qilish, ya’ni ekologik vaziyatni yaxshilash [10].

Qoida tariqasida, yuqoridagi qurilmalar 40-100 kVt / s dan ortiq quvvatga ega va ishlab chiqarish asosida yaratilgan bo‘lib, ular faoliyati natijasida ko‘p miqdordagi energiya tejaydigan biomassa, ya’ni chorvachilik, oziq-ovqat ishlab chiqarish va boshqalardan ajralib chiqadi.

Muqobil energiya olishning deyarli barcha usullarining umumiy muammolari quyidagilardan iborat:

- misol tariqasida, bu tartibga solinmagan energiya manbalari, ya’ni. elektr energiyasini ishlab chiqarish yorug‘lik nurlanishining intensivligiga, ob-havo sharoitlariga, mavsumga, atrof-muhit haroratiga, shamol tezligi va yo‘nalishiga va boshqalarga bog‘liq bo‘lib, bu ularning umumiy elektr tarmoqlariga integratsiyasini sezilarli darajada murakkablashtiradi va ishlab chiqarilgan muqobil energiya narxini oshiradi;

- qabul qilingan elektr energiyasini 220 V, 50 Gts sanoat standartiga etkazish zarurati, buning uchun qimmat invertorlar (olingan energiyaning elektr parametrlarini o‘zgartirgichlar) ishlatiladi, ularning narxi muqobil energiya olish uchun barcha uskunalar narxining 50 foizigacha yetishi mumkin, shu bilan birga ularning ishlashi paytida elektr energiyasining katta qismi issiqlik hosil bo‘lishiga sarflanadi;

-avtonom tizimlarda o‘zgaruvchan energiya ishlab chiqarilmasa, elektr energiyasini to‘plash zarurati tufayli akkumulyator batareyalaridan foydalanish zarurati (ularning narxi butun kompleksning umumiy qiymatining 25 foizigacha yetishi mumkin).

Yuqoridagilardan xulosa qilishimiz mumkinki, muqobil energiya olishning universal usuli yo‘q. Ularning afzalliklari va kamchiliklarini birlashtirib, bir necha usullardan foydalanish kerak. Kam miqdordagi elektr energiyasini ishlab chiqarish uchun bunday muvaffaqiyatli kombinatsiyaga misol sifatida inverter va batareyalar bilan birgalikda ishlaydigan past quvvatli elektr energiyasi va shamol generatoridan iborat kompleksni keltirish mumkin. Bugungi kunda bunday kompleks ancha yuqori narxga ega, ammo kelajakda qayta tiklanmaydigan energiya manbalari narxining oshishi bilan u an’anaviy energiya manbalariga haqiqiy alternativi bo‘lishi mumkin.

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TO‘LQIN ENERGIYASI ASOSIDA ISHLOVCHI GIDROENERGETIK TIZIMLAR SAMARADORLIGI

Annotatsiya: *Turli xil muqobil energiya manbalari tomonidan elektr energiyasini ishlab chiqarish xarajatlari to'g'risidagi ma'lumotlar keltirilgan. Muqobil energiya manbalarini almashish bo'yicha tavsiyalar berilgan. Muqobil energiya olishning asosiy usullari energiya manbalari sifatida mustaqil bino va inshootlardan foydalanish imkoniyati nuqtai nazaridan ko'rib chiqiladi.*

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EFFICIENCY OF HYDROPOWER SYSTEMS BASED ON WAVE ENERGY

Abstract: *Data on the costs of electricity production by various alternative energy sources are presented. The main methods of obtaining alternative energy are considered from the point of view of the possibility of using independent buildings and structures as energy sources. Recommendations on the joint use of alternative energy sources are given.*

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To‘lqin energiyasidan foydalanish biroz murakkabroq va qimmatroq elektr energiyasini olish imkonini beradi. To‘lqinli gidroyelektrostansiya-bu dengiz tubiga biriktirilgan stasionar platforma bo‘lib, unga diametri bir necha metrgacha bo‘lgan katta suzgichlar qo‘llarga (shpallarga) o‘rnatiladi, ular dengiz to‘lqinlarida yuqoriga va pastga siljiydi, gidravlik silindrlar orqali elektr energiyasini ishlab chiqaruvchi generatorlarni boshqaradi. Bugungi kunda shu tarzda ishlab chiqarilgan elektr

energiyasining nisbatan kichik miqdoriga qaramay, ushbu turdagi qayta tiklanadigan energiya manbalarining umumiy energiya potensiali deyarli cheksizdir.

Mini va mikroGES daryolar, kichik daryolar, sharsharalardagi suv massalarining kinetik energiyasidan foydalangan holda o‘z miqdorda, bir necha o‘nlab kVtgacha elektr energiyasini ishlab chiqarishga imkon beradi. Balandlik farqi 1,3 m dan va suv sarfi 1 m3/s mikroGES girdob prinsipiga ko‘ra 10 kVt / soatgacha elektr energiyasini olish imkonini beradi. Ular suv massalarining kinetik energiyasidan maksimal darajada foydalanishga imkon beradigan maxsus shakldagi pervanelli generatorlardan iborat [7].

Kichik gidroyenergetikaning asosiy afzalligi shundaki, u ob-havo sharoitlariga bog‘liq emas va yilning istalgan vaqtida elektroyenergetika ishlab chiqarishni barqaror ravishda ta’minlaydi [8].

Ushbu turdagi muqobil energiyaning kamchiliklari sayyoramizning aylanish tezligiga ta’sir qiladi, hisob-kitoblarga ko‘ra, bu ta’sir sayyoramizning aylanish davri sekinlashishi bilan taxminan 10-9 ni tashkil qiladi, bu to‘lqin oqimlari ta’siridan 5 daraja past.

Bugungi kunda chorvachilik chiqindilarini qayta ishlash orqali elektr energiyasini ishlab chiqarish texnologiyalari allaqachon keng qo‘llanilmoqda, Volga mintaqasida, shu jumladan 40 kVt dan 5 mvtgacha bo‘lgan qurilmalar mavjud. 1 kubometrning energiya samaradorligi biogaz (55-70 % - Ch4, 45-30 % - CO2) 6 kVt / soatgacha bo‘lishi mumkin va undan foydalanganda ichki yonish dvigatelining elektr energiyasini olish uchun energiyaning 45% elektr energiyasi va 55% issiqlik energiyasi shaklida chiqariladi. Biogazning hosildorligi 20 (qoramol go‘ngi) dan 600 gacha (pekmez) kamdan-kam hollarda 1 tonna substrat uchun 1300 kubometrni tashkil qiladi [9].

Yana bir yo‘nalish – biogazni CO2 dan tozalash orqali donni qayta ishlash chiqindilaridan tayyor bioyoqilg‘ini, masalan, biometanni, mahalliy gazning analogini olish.

Ushbu texnologiyani rivojlantirishning navbatdagi bosqichi maishiy chiqindilarni qayta ishlash bilan bog‘liq bo‘lib, unda ikkita juda muhim vazifa hal qilinadi, elektr energiyasini olish va maishiy va sanoat chiqindilarini xavfsiz yo‘q qilish, ya’ni ekologik vaziyatni yaxshilash [10].

Qoida tariqasida, yuqoridagi qurilmalar 40-100 kVt / s dan ortiq quvvatga ega va ishlab chiqarish asosida yaratilgan bo‘lib, ular faoliyati natijasida ko‘p miqdordagi energiya tejaydigan biomassa, ya’ni chorvachilik, oziq-ovqat ishlab chiqarish va boshqalardan ajralib chiqadi.

Muqobil energiya olishning deyarli barcha usullarining umumiy muammolari quyidagilardan iborat:

- misol tariqasida, bu tartibga solinmagan energiya manbalari, ya’ni. elektr energiyasini ishlab chiqarish yorug‘lik nurlanishining intensivligiga, ob-havo sharoitlariga, mavsumga, atrof-muhit haroratiga, shamol tezligi va yo‘nalishiga va boshqalarga bog‘liq bo‘lib, bu ularning umumiy elektr tarmoqlariga integratsiyasini sezilarli darajada murakkablashtiradi va ishlab chiqarilgan muqobil energiya narxini

oshiradi;

- qabul qilingan elektr energiyasini 220 V, 50 Gts sanoat standartiga etkazish zarurati, buning uchun qimmat invertorlar (olingan energiyaning elektr parametrlarini o‘zgartirgichlar) ishlatiladi, ularning narxi muqobil energiya olish uchun barcha uskunalar narxining 50 foizigacha yetishi mumkin, shu bilan birga ularning ishlashi paytida elektr energiyasining katta qismi issiqlik hosil bo‘lishiga sarflanadi;

-avtonom tizimlarda o‘zgaruvchan energiya ishlab chiqarilmasa, elektr energiyasini to‘plash zarurati tufayli akkumulyator batareyalaridan foydalanish zarurati (ularning narxi butun kompleksning umumiy qiymatining 25 foizigacha yetishi mumkin).

Yuqoridagilardan xulosa qilishimiz mumkinki, muqobil energiya olishning universal usuli yo‘q. Ularning afzalliklari va kamchiliklarini birlashtirib, bir necha usullardan foydalanish kerak. Kam miqdordagi elektr energiyasini ishlab chiqarish uchun bunday muvaffaqiyatli kombinatsiyaga misol sifatida inverter va batareyalar bilan birgalikda ishlaydigan past quvvatli elektr energiyasi va shamol generatoridan iborat kompleksni keltirish mumkin. Bugungi kunda bunday kompleks ancha yuqori narxga ega, ammo kelajakda qayta tiklanmaydigan energiya manbalari narxining oshishi bilan u an’anaviy energiya manbalariga haqiqiy alternativi bo‘lishi mumkin. Barqaror bo‘lmagan bino va inshootlarni elektr energiyasi bilan ta’minlash uchun muqobil energiya manbalari sifatida quyosh energiyasi, shamol energetikasi va kichik gidroyenergetika eng mos keladi, muqobil energiyaning qolgan turlari katta miqdordagi elektr energiyasini ishlab chiqarishda eng samarali hisoblanadi.

Shamol generatorining ishlashining asosiy sharti 3 m/s dan yuqori tezlikda harakatlanadigan havo massalarining mavjudligi, shuning uchun, qoida tariqasida, ularning joylashgan joyi qirg‘oq zonalari, tepaliklar, tokchalar (qirg‘oq zonasida joylashgan).

Zamonaviy shamol generatorlari balandligi 100 m dan oshishi mumkin va pichoqlarning diametri bir necha o‘n metrga yetadi. Nominal ish rejimlarida chiqish quvvati (shamol tezligi 10 m/s) 10 Mvtgacha yetadi.

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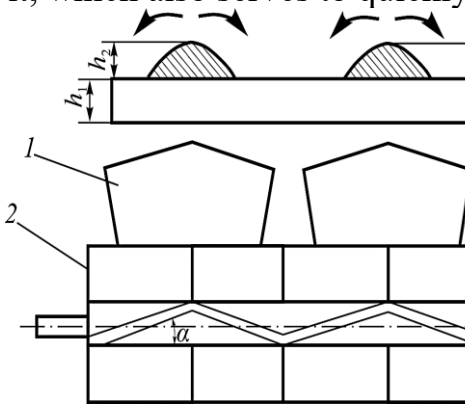
ANALYSIS OF THE WORKING PARTS OF POTATO DEEPING MACHINES

Annotation. *Currently, a number of scientists in Uzbekistan and abroad are engaged in the issue of potato cultivation and harvesting. However, to date, the issue of mechanization of potato harvesting in conditions of low soil moisture has not been fully resolved. This article provides a detailed analysis of the working parts of potato harvesting machines.*

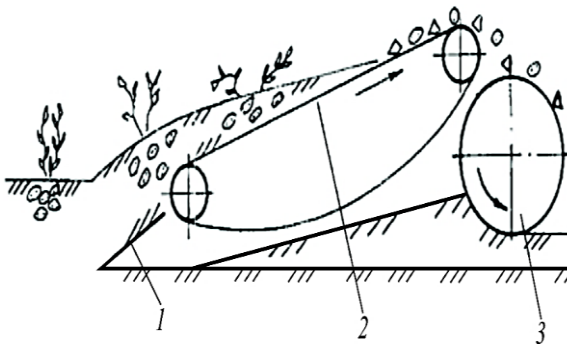
Keywords: *potato digger, combine, aggregate, profitable, resource, soil, chopper, elevator, hydraulic system, sieve.*

The scheme of the potato digger created by scientists from the Ryazan State University of Agrotechnology is shown in Figure 1.1 [5]. Its main working part is the share (1), which is made in the shape of a trapezoid. A device (2) is installed at the beginning of the elevator to accelerate the excavated mass. Also, another potato digger elevator (Figure 1.2) has a support wheel with a rubber surface mounted behind it, which also serves to quickly crush the soil [6].



1-trapezoidal coulters; 2-accelerating device

Figure 1.1.
Potato digger diagram



1-scythe; 2-elevator; rubber wheel.

Figure 1.2.
Potato digger diagram

A lot of research work has been carried out on the process of sifting the soil-potato mass and the creation of a sifting working body [7; 185-p., 8; 218-p., 9; 168-p., 10; 145-p., 11; 186-p., 12; 140-141-p., 13; 75-80-p., 14; 76-81-p.].

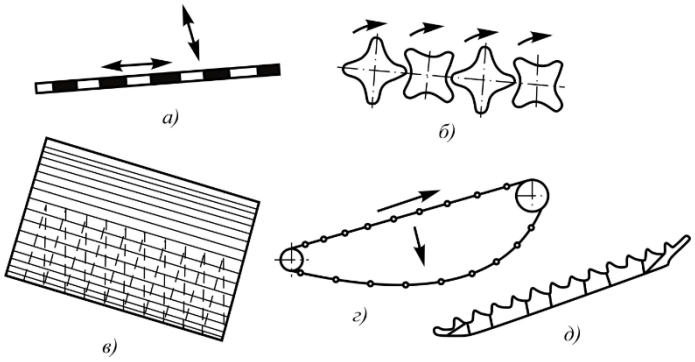
The sifting and sorting working parts of potato diggers are divided into two main parts depending on the place of installation in the technological schemes of potato diggers and combines:

- primary sorting working parts;
- secondary sorting working parts.

The primary sorting section separates 60–70% of the potatoes from the soil, while the secondary sorting section separates the remaining potatoes from the soil.

The following main requirements are imposed on working bodies of this type: high productivity of the main screening working bodies (150 kg/h), minimal loss and damage of nodules (2–3%), high operational reliability and simplicity of design, simultaneous sifting of the soil and upward transfer of the mass, ensuring greater separation of nodules from the soil (70–80%)

The main types of primary screening working parts of potato diggers are shown in Figure 1.3.



a – with a bar;
b – with a ear;
c – with a drum;
d – with a finger;
d – with a key

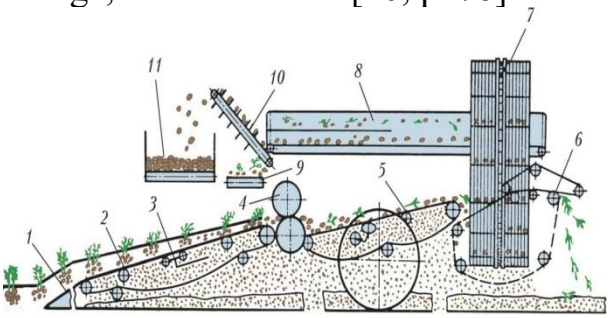
Figure 1.3.
Types of primary screening working parts of potato diggers

The screw elevator (Fig. 1.3, a) has been the main working unit of potato harvesters in the world for more than a century, although it was invented. The main reason for its widespread use is its simplicity of design and the ability to simultaneously sift and transport the layer upwards at an angle of inclination of 20° [15; p. 62].

Along with these good features, slatted elevators also have disadvantages: friction occurs on a large surface, which accelerates the wear of parts and leads to a large expenditure of energy to move the elevator slats. This is because the slatted surface accounts for 40% of the total surface area; the relative surface area is small (less than 70%); when working in fields with wet soil, soil can get stuck between the slats, etc. The advantage of vibrating grate shakers (Fig. 1.3, a) is that they can easily maintain the distance between the bars within the required range (10-20 mm) by periodically changing the grate [15; p. 145].

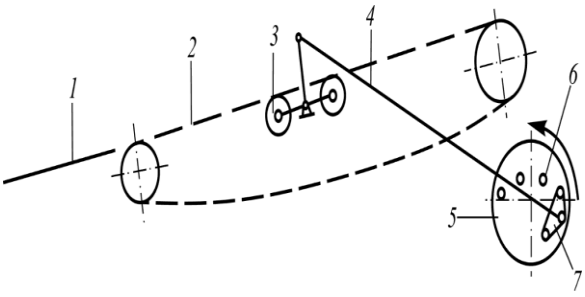
Separators equipped with a vibrating mechanism with a hopper constitute a large group (Fig. 1.3, b). Their advantage is the absence of inertial forces and friction, good separation of soil particles and plant residues. The disadvantage is the high damage to the nodules. In the past, potato diggers in many cases used drum-type vibrating elevators (Fig. 1.3, v). Their advantages are mainly reliability, non-slip properties and the ability to lift the soil mass upwards. However, clogging of the drum with plant residues and wet soil sharply reduces the threshing capacity.

According to Sorokin A.A., potato harvesters with a tine elevator, when high agrotechnical conditions are applied to the field and the optimum humidity is 18–20%, can separate 85% of the soil. Therefore, the above-mentioned tine elevators and separators are of great importance in potato harvesting, and their operation leads to high-quality secondary threshing, cleanliness in the threshing unit, lack of damage, and low losses [16; p. 78].



1 – plowshare; 2 – roller; 3 – shaking mechanism; 4 – pneumatic chopper drum; 5 – drive shaft; 6 – shaft driving the stem separator; 7 – lifting drum; 8 – sorting table; 9 – conveyor for loading the separated mass;
10 – conveyor; 11 – hopper

Figure 1.4. Technological scheme of the "KKU-2A" combine harvester



1 – plowshare; 2 – main elevator; 3 – rollers; 4 – connecting rod; 5 – disc; 6 – holes; 7 – plank

Figure 1.5. Scheme of the shaking mechanism of the KKU-2A combine

The two-row "KKU" combine harvester generation, developed jointly by the Russian Research Institute of Agricultural Machinery (VISKHOM) and the Ryazan GSKB, is the most mass-produced potato harvesting equipment, and the one currently in use is the KKU-2A combine harvester (Figure 1.4). Its main screening device is the shaking mechanism (Figure 1.4) consisting of a pair of rollers 3 mounted at the end of a two-arm lever driven by a connecting rod 4 mounted on the combine elevator. It should be noted that the KKU-2 A combine has a number of disadvantages: low technological reliability, excessive weight of the machine, and frequent damage to the nodes. The main elevator of the AVR "Spirit-4100" and "Grimme" DR-1500 potato harvesters uses a vibrating mechanism of the elevator cloth to accelerate the sifting process (Figures 1.6 and 1.7). The disadvantage of mechanical vibrating mechanisms is that they cannot generate sufficient vibrations in the low frequency range required for crushing large pieces [17].

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MASOFAVIY TA‘LIM - SIRTQI O‘QISHNING YANGI SHAKLI

Annotatsiya: *Maqolada masofaviy va sirtqi ta‘limda o‘quv jarayonini tashkil qilinishi tahlil qilingan va ularni bir-biriga mutanosiblik tomonlari aniqlangan. Sirtqi va masofaviy ta‘lim bir-biriga yaqindir, ularning bir-biriga o‘xshash tomonlari ko‘pdir. Shuning uchun ham masofaviy ta‘lim uslubi bu sirtqi o‘qishning yangi shaklidir. U eng yaxshi an‘anaviy va innavatsion metodlar, o‘qitish vositalari va shakllarini o‘z ichiga olgan sirtqi va kunduzgi ta‘lim singari axborot va telekommunikatsiya texnologiylariga asoslangan ta‘lim sohasidir.*

Kalit so’zlar: *oliy ta’lim, masofaviy ta‘lim, sirtqi ta‘lim, axborot-kommunikatsiya texnologiyalari, interaktiv audio va video konferensiyalar, masofaviy ta‘limni boshqarish bo‘yicha dasturiy ta‘minot, o‘quv kontenti, yakuniy hazorat.*

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DISTANCE LEARNING - A NEW FORM OF EXTERNAL LEARNING

Abstract: *The article analyzes the organization of the educational process in distance and correspondence forms of education, identifies aspects of their relationship with each other. Correspondence and distance education are close to each other and have much in common. That is why distance learning is a new form of correspondence education. It is an educational field based on information and telecommunication technologies, such as distance and face-to-face education, which includes the best traditional and innovative methods, means and forms of teaching.*

Key words: *higher education, distance learning, correspondence education, information and communication technologies, interactive audio and video*

conferencing, distance learning management software, educational content, final exam.

Oliy ta‘lim tizimida masofadan o‘qitish uslubi shakllari qo‘llanilmoqda. Masofaviy ta‘limning maqsadi axborot-kommunikatsiya texnologiyalaridan foydalanish asosida talabaning turar joyidan qat‘i nazar, unga ta‘lim dasturlarini o‘zlashtirish uchun imkoniyat taqdim etish, talabalarning qiziqishlari, iqtidori va ehtiyojlariga muvofiq kasbiy salohiyatini rivojlantirishdan iborat, lekin bunday ta‘rif sirtqi ta‘limga ham berilishi mumkin[1-3]. Shundan kelib chiqib ushbu maqolada masofaviy va sirtqi ta‘limda o‘quv jarayonini tashkil qilinishi tahlil qilingan va ularni bir-biriga mutanosiblik tomonlari aniqlangan.

Sirtqi va masofaviy ta‘lim uchun talabalarni ta‘lim tashkilotiga qabul qilish, ularning o‘qishini ko‘chirish, qayta tiklash va o‘qishdan chetlashtirish boshqa ta‘lim shakllari uchun qonunchilik hujjatlarida belgilangan tartibda bir xil shaklda amalga oshirilmoqda. Sirtqi va masofaviy ta‘lim shakli to‘lov-kontrakt asosida amalga oshirilmoqda, lekin ikkala ta‘lim shaklida to‘lov-kontrakt mablag‘i miqdori bir-biridan farq qiladi, masofaviy ta‘limda talaba kamroq mablag’ sarflaydi. Iqtisodiy jihatdan maqbul variantlarni qidirayotgan talabalar uchun masofaviy ta’lim eng to‘g‘ri yo‘l, lekin onlayn ta’limda talabaning chalg‘ish ehtimoli yuqori bo‘lganligi sababli ko‘p vaqt va mablag‘ sarflashi mumkin.

Sirtqi va masofaviy ta’limda ta’lim oluvchilar sonining ortirish imkoniyati paydo bo‘ladi.

Masofaviy ta’lim shakli joriy etish mumkin bo’lmagan bakalavriat ta’lim yo’nalishlari va magistratura mutaxassisliklari oliy ta’lim, fan va innovatsiyalar vazirligi tomonidan belgilanadi, lekin sirtqi o’qitishda barcha bakalavriat ta’lim yo’nalishlari va magistratura mutaxassisliklari bo’yicha mutaxassis kadrlar tayyorlanadi.

Sirtqi va masofaviy ta’limni **afzalliklari va kamchiliklari** bir-biriga solishtirilganda shu narsa aniqlandiki, onlayn bilim olishda Internet provayderlarining sekin ishlashi yoki tez-tez aloqa uzilib qolishi ehtimoli mavjuddir. Shahardan uzoqlashgan sari bu kamchiliklar ko’chayib boradi. Bu vaziyatda talabaning ta’lim olishga bo‘lgan intilishi va qiziqishi so‘nadi. Sirtqi ta’limda esa Internet bilan bog’liq muammolarni o’z vaqtida bartaraf etish mumkin.

Sirtqi ta’limning eng muhim tomoni shundaki, semestr davomida o’qitiladigan fanlar bo’yisha qisqacha(ishchi o’quv rejasida belgilangan hajmda) ma’ruza, amaliy, laboratoriya va seminar mashg’ulotlar guruh bo‘lib o‘tiladi. Guruhda ba’zi talabalar tezroq, ayrimlari esa sekin o’zlashtiradilar. Bu jihatdan masofaviy ta’lim olish usuli samaraliroq, chunki talaba fanni masofaviy ta’limni maxsus platforma yordamida mustaqil o’zlashtiradi. Masofaviy ta’limda talaba va o’qituvchi fazoviy bir-biridan ajralgan holda o’zaro maxsus yaratilgan o’quv kurslari, nazorat shakllari, electron aloqa va Internetning boshqa texnologiyalarini qo’llashga asoslangan masofaviy o’qitish jahon axborot ta’lim tarmog’iga kirish imkonini beradi, integratsiya va o’zaro aloqa tamoyiliga ega bo’lgan muhim bir turkum yangi funksiyalarni bajaradi.

Masofaviy o‘qitishda turli xil axborot va kommunikatsiya texnologiyalaridan foydalaniladi, bu yerda interaktiv audio va video konferensiyalar ma’lum vaqt orasida o‘zaro muloqotda bo‘lishga, elektron pochta to‘g‘ri va teskari aloqa o‘rnatishga, ya’ni xabarlarni jo‘natish va qabul qilishga yordam beradi. Oldindan tasmaga muhrlangan videomaruzalar talabalarga ma’ruzalarni tinglash va ko‘rish imkonini bersa, maksimal aloqa onlayn o‘qitish samaradorligini oshirish imkonini beradi. Sirtqi ta’limda esa bunday imkoniyatlar cheklangan.

Sirtqi va masofaviy ta‘limda Siz o‘qish bilan bir qatorda ish bilan ham shug‘ullanishingiz mumkin.

Masofaviy ta’lim bo‘yicha o‘qish davomiyligi tegishli bakalavriat ta’lim yo‘nalishi va magistratura mutaxassisligi bo‘yicha kunduzgi ta’lim shakli uchun belgilangan o‘qish davomiyligi muddatidan kam bo‘lishi mumkin emasligi belgilangan. Sirtqi ta’limda esa o‘qish muddati kamida 5 yil qilib belgilangan. Bundan chiqdi, talabalar masofaviy ta’limda sirtqi ta’limga nisbatan kamroq o‘qiydi, shuning ucnun xarajatlar ham bo‘ladi.

Binobarin, masofaviy ta‘lim bo‘yicha o‘quv jarayoni davlat ta’lim standarti va malaka talablari asosida ishlab chiqilgan o‘quv reja va o‘quv dasturlar asosida amalga oshiriladi. Sirtqi ta’limda esa o‘quv jarayoni ta’lim sohalarining davlat ta’lim standartlari va tegishli ta’lim yo‘nalishlari malaka talablari asosida tayyorlangan hamda O‘zbekiston Respublikasi Oliy ta’lim, fan va innovatsiyalar vazirligi tomonidan kunduzgi ta’lim uchun tasdiqlangan o‘quv rejasi va fan dasturlari asosida tashkil etiladi.

Masofaviy ta‘limda bir o‘qituvchiga to‘g‘ri keladigan talabalar soni nisbatining cheklangan normativlari 1:50 nisbatda belgilangan. Sirtqi ta’limda esa o‘qish bo‘yicha oliy ta’lim yo‘nalishlariga qarab bir o‘qituvchiga to‘g‘ri keladigan talabalar soni nisbati 1:20 etib belgilangan. Bundan ko‘rinib turibdiki, masofaviy ta‘lim ucnun kam professor-o‘qituvchilar jalb etiladi, chunki masofaviy o‘qitish shaklida o‘quv jarayonini tashkil etishda o‘quv kontenti — o‘quv jarayonida talabalarning foydalanishi uchun mo‘ljallangan, masofaviy ta’limni boshqarish axborot tizimiga joylashtirilgan o‘quv metodik materiallar (o‘quv rejalari, o‘quv dasturlari, ma’ruza matnlari, videodarslar, taqdimotlar, topshiriqlar, imtihon materiallari, o‘quv adabiyotlari) yaratiladi. Ta’lim sohalari bloklari va shakllari bo’yicha bir nafar o’qituvchi hisobiga to’g’ri keladigan talabalar soni nisbatining me’yorlari qonunchilik hujjatlari asosida belgilanadi.

Shunday qilib, sirtqi ta’limda masofadan turib o‘qitish talabalarning asosiy ish joyidan ajralmagan holda o‘quv rejasidagi barcha fan dasturlarida belgilangan bilimlarni mustaqil masofadan turib o‘zlashtirish asosida amalga oshirilishi mumkinligini hisobga olsak, sirtqi va masofaviy ta‘lim bir-biriga yaqindir, ularning bir-biriga o‘xshash tomonlari ko‘pdir. Shuning uchun ham masofaviy ta‘lim uslubi bu sirtqi o‘qishning yangi shakli va mustaqil o‘qishdir.

Foydalanilgan adabiyotlar:

1. O‘zbekiston Respublikasi Vazirlar Mahkamasining 2017-yil 21-noyabrdagi 930-son qarori bilan tasdiqlangan “Oliy ta’lim muassasasida sirtqi (maxsus sirtqi) ta’limni tashkil etish tartibi to‘g‘risida Nizom”.

2. O‘zbekiston Respublikasi Vazirlar Mahkamasining 2022-yil 3-oktabrdagi 559-son qarori bilan tadiqlangan “Oliy ta‘lim tashkilotlarida masofaviy ta‘limni tashkil etish tartibi to‘g‘risida Nizom”.
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MINERAL FERTILIZERS FOR PLANTING THE INFLUENCE OF HARVEST SOYBEAN AND CORN

Annotation: *Crops such as maize, sorghum, Sudan grass, oats, and soybeans can be cultivated as secondary crops. In order to produce highly nutritious feed required for livestock farming, intercropping maize and soybean as a secondary crop is an important technological measure. Maize is a high-yielding crop with sufficient feed units, but its protein content does not meet the nutritional requirements. Soybean is also a high-yielding crop, and the feed produced from it contains a high amount of protein but fewer feed units.*

Keywords: *maize, soybean, mineral fertilizer, secondary crop, yield.*

In the Resolution No. PQ-4243 of the President of the Republic of Uzbekistan dated 2019, **"On measures to further develop and support the livestock sector",** it is stated: "The accelerated development of the livestock sector plays an important role in providing the population with affordable and quality meat and other food products, especially in increasing employment and incomes of people living in rural areas.

At the same time, the current state of affairs in the regions requires the implementation of specific comprehensive measures to support enterprises in this sector, expand the fodder base, improve breeding practices, including the development of artificial insemination, and strengthen the material and technical base of breeding farms."

In order to meet the growing demand of the population for food and to produce highly nutritious feed for livestock, it is necessary to develop new intensive technologies in crop production. It is essential to research and implement technological measures that ensure high-quality yields in field crop cultivation, make full use of irrigated lands, and enhance soil fertility.

Therefore, it is necessary to identify effective methods for the full utilization of the existing land resources. In our country, serious attention is being paid to the

development of grain production. Scientific research is being conducted in several directions with the aim of growing a second crop by utilizing the land vacated after wheat harvesting.

As a secondary crop, maize, sorghum, Sudan grass, oats, and soybean can be cultivated. In order to produce highly nutritious feed required for livestock, intercropping maize and soybean as a secondary crop is considered an important technological practice. Maize is a high-yielding crop and has a sufficient feed unit value, but its protein content does not meet the required standards. Soybean is also a high-yielding crop, and while it has a high protein content, its feed unit value is relatively low. However, when these two crops are cultivated together, it is possible to produce a balanced feed that meets both protein and energy requirements.

When maize is intercropped with soybean and 135 kg of nitrogen is applied, maize yields range from 7.44 to 9.08 tons per hectare. Without fertilizer application, yields range from 4.23 to 7.53 tons per hectare [2].

When different nitrogen fertilizer rates were studied, the best results for intercropped sorghum and soybean were obtained with the application of 120 kg/ha of nitrogen [3].

Nitrogen-phosphorus fertilizers have a positive effect on maize intercropped with soybean, leading to an increase in nitrogen content within the plants. As a result, the protein content in the green mass increased by 1.2–4.3%, phosphorus by 0.04–0.11%, potassium by 0.41–0.85%, fat by 0.1–1.0%, ash by 1.0–2.1%, and calcium by 0.01–0.16%. In addition, the protein yield increased from 12.7 to 28.8 centners per hectare, and the feed unit yield rose from 128.2 to 171.4 centners per hectare [1].

In the experiment, crops were sown using the same method: row spacing was 60 cm, and plant spacing within the row was 10 cm. There were 5 maize plants and 5 soybean plants per meter. Accordingly, when planted as sole crops, the plant density for both maize and soybean was 83.3 thousand plants/ha, and when intercropped, the total density reached 166.6 thousand plants/ha.

Experimental results showed that plant survival rates depended on both the sowing method and nutrient availability. During the germination stage, the number of plants closely matched the theoretical plant population, indicating the influence of both sowing method and nutrient supply.

Since maize has stronger growth vigor and is taller than soybean, the number of maize plants did not differ significantly between sole and intercropping systems. The sowing method had little effect on maize survival, whereas nutrient supply had a more pronounced impact. In the first variant (sole cropping of maize), the plant density after thinning was 82.8 thousand plants/ha, and before harvest it was 78.5 thousand plants/ha.

In the second variant (maize intercropped with soybean), after thinning, the maize and soybean plant densities were 63.0 thousand/ha and 72.9 thousand/ha respectively, totaling 135.9 thousand/ha. Before harvest, the densities were 61.6 thousand/ha for maize and 63.1 thousand/ha for soybean, totaling 124.7 thousand/ha. Thus, the total number of plants in the intercropping variant was 46.2

thousand/ha higher than in the control (sole cropping) variant.

In re-sown maize, stem height increased by 8.8 to 19.4 cm due to fertilizer application. In re-sown soybean, stem height was 72.4 cm without fertilizer, 82.6 cm with the application of nitragin, 85.8 cm with the combination of P60K60 + nitragin, 90.1 cm with N60P60K60 + nitragin, and reached 99.2 cm with N90P60K60 + nitragin. Thus, stem height increased by 10.2 cm due to nitragin, and by an additional 3.4 to 10.7 cm depending on the applied rates of mineral fertilizers. Mineral fertilizers had a positive effect on the growth of both re-sown maize and soybean crops.

The variability in growth results of maize intercropped with soybean is attributed to differences in soil and climatic conditions, varietal characteristics, and cultivation technology.

According to the experimental data, the height of maize and soybean plants depended on the sowing method and fertilization conditions. In the first variant, where maize was sown alone, its average height recorded on July 20 was 72 cm. In the second variant, where maize was intercropped with legumes (soybean), the maize height was 73 cm, and soybean height was 29 cm. On August 11, in the variant "Vatan N90P90K60," the average height of maize reached 141 cm. When maize was intercropped with soybean under the same fertilization rate ("Vatan + soybean N90P90K60"), maize height increased to 162 cm, and soybean height reached 40 cm, indicating a noticeable difference. In the third variant, where "Vatan + soybean" was fertilized with N120P90K60, maize height reached 175 cm, while soybean reached 43 cm.

On September 11, in the variant "Vatan N90P90K60," the average height of maize was 159 cm. When intercropped with legumes (soybean) under the same fertilization rate ("Vatan + soybean N90P90K60"), maize height reached 175 cm and soybean height was 54 cm. In the third variant, where "Vatan + soybean" was fertilized with N120P90K60, maize reached a height of 222 cm and soybean 58 cm.

Soybean plants exhibited good growth under the influence of fertilization, and the positive effect of fertilizers was clearly observed. However, when intercropped with maize, soybean stems were thinner and less branched. This indicates the differences in the biological characteristics of the crops used in the experiment.

Plant growth and stem height are among the key factors influencing yield formation. In cases where plants showed vigorous growth, higher green biomass yields were obtained.

It is well known that, according to zootechnical requirements, to achieve the planned level of livestock production, one feed unit should contain 100–120 grams of protein. Therefore, in our experiment, along with the number of feed units, we also determined the protein content in the green mass. For this, published data were used.

Table 1.
Protein yield per hectare in sole and intercropped planting systems

treatmeans	Protein content, kg/ha		
	soybean	maize	total
Vatan N_{90} P_{90} K_{60}	-	701	701
Vatan + soybean N_{90} P_{90} K_{60}	111	759	870
Vatan + soybean $N_{120}P_{90}$ K_{60}	195	916	1111

According to the results of the experiment, in the first variant (Vatan N90P90K60), the protein yield was 701 kg/ha; in the second variant (Vatan + soybean N90P90K60), it was 870 kg/ha; and in the third variant (Vatan + soybean N120P90K60), protein yield reached 1111 kg/ha.

According to the data in the above table, when the maize hybrid "Vatan" was planted alone with the initial fertilizer rate, 701 kg/ha of protein was obtained. When intercropped with soybean, this figure increased by 169 kg. When a moderate fertilizer rate was applied, the sole-planted maize hybrid produced 701 kg/ha of protein. With an increased fertilizer rate, intercropping maize hybrid with soybean resulted in a total of 1111 kg/ha of protein, which is 410 kg/ha more than the control (first variant).

It was found that the quality of the obtained green mass depended on the planting method, hybrid characteristics, and fertilizer application. Intercropping soybean with the maize hybrid "Vatan" improved the quality of the green fodder and enhanced its nutritional value.

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GLOBAL IQLIM O‘ZGARISHINING SABAB VA OQIBATLARI, O‘ZBEKISTON SHAROITIDA UNI YUMSHATISH YO‘LLARI

Annotatsiya: *Atmosferaga issiqxona gazlarining ortiqcha chiqarilishi, sanoat va transportning keskin rivojlanishi, o‘rmonlarning qisqarishi kabi omillar global isishning kuchayishiga olib kelmoqda. Iqlim o‘zgarishi natijasida qurg‘oqchilik, suv tanqisligi, tuproq eroziyasi, ekotizimlarning izdan chiqishi kabi muammolar yuzaga kelmoqda. Xususan, O‘zbekiston uchun bu jarayonlar dehqonchilik, ichimlik suv manbalari va aholi salomatligiga salbiy ta'sir ko‘rsatmoqda. Maqolada iqlim o‘zgarishining salbiy oqibatlarini yumshatish maqsadida O‘zbekiston sharoitida amalga oshirilishi mumkin bo‘lgan chora-tadbirlar yoritib berilgan.*

Kalit so‘zlar: *Issiqxona samarasi, arid iqlim, antropogen yuk, fitomelioratsiya, o‘rmonsizlanish, cho‘llanish*

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CAUSES AND CONSEQUENCES OF GLOBAL CLIMATE CHANGE, WAYS TO MITIGATE IT IN THE CONDITIONS OF UZBEKISTAN

Annotation: *Factors such as excessive emissions of greenhouse gases into the atmosphere, rapid development of industry and transport, and deforestation are leading to increased global warming. As a result of climate change, problems such as drought, water shortages, soil erosion, and ecosystem disruption are emerging. In particular, for Uzbekistan, these processes are negatively affecting agriculture, drinking water sources, and public health. The article highlights measures that can be implemented in Uzbekistan to mitigate the negative consequences of climate change.*

Keywords: *Greenhouse effect, arid climate, anthropogenic load, phytomelioration, deforestation, desertification*

Iqlim o‘zgarishi muammosi urush va tinchlik, qashshoqlik, ekologik, xalqaro terrorizm, cho‘llanish kabi dunyoviy (global) muammolar sirasiga kiradi. “Global” atamasi fransuzcha “global” degan so‘zdan kelib chiqqan bo‘lib, “umumga oid”, “umumga taalluqli”, “umum bilan bog‘liq” ma’nolarini anglatadi. Etimologik nuqtayi nazardan “global” so‘zi lotincha “globus” ya’ni “shar” so‘zidan kelib chiqqan.

Global muammolar keng ma'noda tabiat va inson (jamiyat) o'rtasidagi munosabatlar muvozanatinining buzilishi natijasida kelib chiqadi. Demak, mazkur muammolar tabiiy-antropogen ildizga ega. Insoniyatning munosib hayot kechirishi va jamiyatning barqaror rivojlanishi uchun boshqa omillar qatorida iqlimiy sharoit ayniqsa muhim ahamiyatga ega. Uning oz bo'lsa-da, me'yordan chetga chiqishi barqaror rivojlanishga tahdid soladi, ijtimoiy muammolarni keltirib chiqaradi.

Iqlim–Quyosh va uning atrofida aylanib turadigan yo'ldoshi –Yer o'rtasidagi munosabatlar natijasida yer betiga yaqin bo'lgan atmosfera qatlamida ro'y berib turadigan tabiiy jarayonlar natijasidir [4].

Iqlim isishi o'z navbatida avval kuzatilmagan hodisalarni, suv-toshqinlarini, bo'ron, qurg'oqchiliklarni keltirib chiqaradi. Afrikada qurg'oqchilik va ocharchilikda, Janubiy Osiyoda ob-havoning isib ketishida, Shimoliy Amerikadagi o'rmon yong'inlari va bo'ronlar orqali buni ko'rib turibmiz. Olimlarning aytishicha 2015-yilning o'n oyida sayyoramizda harorat XIX asr boshlariga nisbatan 1,02 ℃ ko'tarilgan. [1].

Rus olimlari N.A. Gladkov va boshqalar 1975-yilda asosan atrof-muhitning ifloslanishini tabiiy va antropogen omillarga bo'lib o'rganishni taklif etadi. [2].

Yer yuzasining turli mintaqalarida vulqonlar otilishidan chiqqan kul va gazlar, o'rmon, dashtlardagi yong'inlar, turli tuz zarralari bilan to'yingan tumanlar, tuproq changlari va mayda qumlar, mikroorganizmlar, hayvon qoldiqlari va kosmik changlar atmosferaning tabiiy yo'l bilan ifloslanishida asosiy rol o'ynaydi. Shunday bo'lsada atmosferaning ifloslanishida tabiiy omillarning hissasi ko'p emas ya'ni 13% ni tashkil etmoqda.

Hozirda tabiat emas, biz yer tabiati, atmosfera tarkibini va iqlimini ham o'zgartirmoqdamiz. Hozirgi kunda har kuni dunyoda 9 milliard litr neft yoqiladi. Buning natijasida havodagi CO_2 ning miqdori 30%ga ortib bormoqda. Yana bir dalil, 1995-yilda ishlab chiqarilgan avtomabillar 2010-yildagiga nisbatan 38 marta ko'p zaharli gazlarni atmosferaga chiqargan. Bu esa katta avtomabil yo'li yoqasida yashaydigan bolalar o'rtasida autizm kasalligining ortganligiga sabab bo'lgan [3].

Yer yuzasida qaror topgan ushbu iqlimiy sharoit XX asrning o'rtalariga kelib kuchli antropogen ta'sir kuchiga duch keldi. Atmosfera havosining buzilishida antropogen (inson) omilning ulushi 87% ni tashkil etadi. Ya'ni, aholining ko'payishi, tabiiy resurslarga bo'lgan talabning beto'xtov ortib borishi va nihoyat fan va texnika bilan qurollangan insonning tabiatga ta'sir kuchining ortib borishi Yer shari iqlimining o'zgarishiga olib keldi. Bu jarayonni quyidagi dallilar bilan asoslash mumkin:

✓ Birinchidan, atmosferaning kimyoviy fizik tarkibiga antropogen faoliyat ta'sirining ortib borayotganligi, ozon qatlamining yemiruvchi freon gazlarning hamda karbonat angidrid va boshqa "issiqxona samarasi" hosil qiluvchi gazlarni va aerozollarni chiqarish, turli organik yoqilg'ilarni yoqish va energiya sarflash orqali atmosfera haroratiga ko'rsatilayotgan ta'sirning ortib borayotganligi;

✓ Ikkinchidan, tabiiy resurslarning jadal su'ratlar bilan o'zlashtirilishi (yer, suv, o'rmon, tog'-kon) tufayli Yer sirti albedosining o'zgarishi;

✓ Uchinchidan, dunyo okeani sathining ko‘tarilishi va suvi tarkibining ifloslanishi tufayli atmosfera-okean-quruqlik tizimida kechadigan havo, suv almashinuviga ta’sir ko‘rsatishi;

✓ To‘rtinchidan, yer yuzida sodir bo‘layotgan etnik nizolar, davlatlararo kelishmovchilik, urushlar, xalqaro terrorizm tabiiy va industrial halokatlarning jadal tus olayotganligi;

✓ Beshinchidan, antropogen ta’sir tufayli Yer yuzida modda, energiya almashinuvi tufayli tabiiy, iqtisodiy-ijtimoiy jarayonlar shiddatining ortayotganligi;

✓ Oltinchidan, havo transporti va kosmosni o‘zlashtirish tufayli atmosferaga antropogen ta’sir yukining ko‘payib borayotganligi va boshqa dalilarni keltirish mumkin.

Iqlimshunoslarning ma’lumotiga ko‘ra, yuqorida qayd qilingan jarayonlar tufayli global iqlim isishi kuzatilmoqda. Buning yana bir asosiy sababi uzun to‘lqinli radiatsiyani yutib, atmosferada issiqxona effekti hosil qilayotgan gazlardir. Bu jarayon quyidagicha kechadi: Quyoshdan keladigan radiatsiyaning bir qismi (30%) atmosfera tufayli (asosan bulutlar orqali) kosmosga qaytariladi. Taxminan 15%i esa atmosferaga yutiladi. Qolgan energiya atmosferadan o‘tib, Yer betiga yetib keladi va uni isitadi. Yer esa o‘z navbatida atmosfera orqali uzun to‘lqinli infraqizil nurlarni koinotga qaytaradi. Ushbu nurlarni bir qismi koinotga chiqib ketish o‘rniga issiqxona gazlari tomonidan yutiladi va shu asosda atmosfera me’yoridan ortiqroq qiziydi va nihoyat Yer iqlimiga ta’sir ko‘rsatadigan issiqxona qatlami hosil qiladi. Issiqxona samarasi hosil qiladigan gazlarning atmosferada ortib borishi yuqorida aytganimizdek, insonning Yer yuzidagi faoliyati bilan bog‘liq. Bunday gazlar asosan oltita. Eng asosiysi karbonat angidrid gazidir (CO_2). Ular toifasiga yana metan (CH_4), azot oksidi (N_2O), perftoruglerod (PFCs), gidroftoruglerodlar (HFCs) va oltingugurt geksaftoridi (SF_6) kiradi[4].

Karbonat angidrid gazi bularning orasida eng ko‘pi hisoblanadi. Karbonat angidrid gazi havo tarkibidagi miqdori 1% ga yetguncha odam va boshqa jonzotlarning nafas olishiga xavf tug‘dirmaydi. Lekin bu gazning juda katta qismi ,,yutib’’ tiriklik ahli uchun hayot manbai hisoblanmish kislorodni ishlab chiqaruvchi o‘rmonzorlarning yildan-yilga qisqarib borishi atmosferada kislorod yetishmovchiligini keltirib chiqarishi bilan birga karbonat angidrid gazining ko‘payishiga ham olib keladi. Iqlim o‘zgarishi qishloq xo‘jaligi sohasida ham katta muammolarni yuzaga keltiryapti. Xususan, madaniy o‘simliklar ekish geografiyasi o‘zgarib, hosildorlik pasayib bormoqda [5].

Iqlim o‘zgarishi natijasida hosil bo‘ladigan eng xavfli, eng jiddiy global muammo bu muzliklaring erishi natijasida okean suvlari sathining ko‘tarilishidir. Agar haroratning o‘rtacha isishi 4-4,5 ℃ ga yetsa, Antarktida materigi muzliklari to‘la erib ketishi oqibatida okean suvlari 5-9 metrga ko‘tarilishi, Grenlandiya orolidagi muzliklari erishi natijasida bu ko‘rsatkich yana 7 metrga yetishi mumkin. Dengiz sathining 66 metr ko‘tarilishi evaziga Yer iqlimi butunlay o‘zgarib ketishi bilan birga ko‘plab hosildor yerlar, o‘tloqzorlar, shaharlar, hatto butun boshli mamlakatlar ham suv ostida qolib ketishi hech gap emas. Shu bois bugun olimlarni

Yerni „dimiqtirib” qo‘ymaslikka doir chora tadbirlar masalasi jiddiy o‘ylantirmoqda [6].

Shunday qilib, iqlim o‘zgarishi bilan bog‘liq yuzaga kelgan salbiy oqibatlar quyidagilardir:

- ko‘pgina tropik va suptropik regionlarda qishloq xo‘jalik ekinlari yalpi hosildorligini kamayishi;
- uy hayvonlari va yovoyyi hayvonlarga issiqlik tayziqi ortadi;
- tuproq eroziyasi kuchayadi;
- ichimlik suvining sifati va miqdori kamayadi;
- o‘rmon yong‘inlari xavfi ortadi;
- materik muzliklarning erishi kuzatiladi;
- o‘simlik va hayvonlar ayrim turlari populyatsiyasining qisqarishi;
- cho‘llashish jarayonining kuchayishi;

Xulosa o‘rnida iqlim o‘zgarishi bilan bog‘liq ekologik muammolarni kamaytirish hamda yechimlarini topish borasida quyidagi fikr-mulohazalarni bildiramiz:

- arid iqlimli hududlarda aholiga uy-joylar qurishda xalq tajribasidan foydalanish yuqori samara beradi. Masalan, sho‘rxoklar tarqalgan hududlarda yog‘och asosli uylar “shimol-janub” yo‘nalishida qurish, ularning tomlari yashil rangli shefirlar bilan qoplanishi, uy devorlari oq emas balki ko‘kimtir rangda bo‘yash maqsadga muvofiq. Chunki qizil rang quyosh nurini ko‘p yutadi, oq rang esa nurni ko‘p qaytargani bois ko‘z kasalligi yuzaga kelishi bilan birga, iqlimning mahalliy isishiga sabab bo‘ladi. Lyoss jinslar tarqalgan adirlarda paxsa uylar qurish lozim. Bunday uylar qishda issiq, yozda esa salqin bo‘ladi.

- qurg‘oqchilikka chidamli serhosil navlarni yaratish va undan keng maydonni fitomelioratsiya qilishda foydalanish zarur. Masalan, uy atroflari, madaniy istirohat bog‘lari va boshqa hududlarni ko‘kalamzorlashtirishga mahalliy o‘simlik va daraxtlardan (tut, jiyda, o‘rik, gilos) foydalangan ma’qul, Sababi ushbu o‘simliklar bu noqulay qurg‘oqchil hududga chidamli bo‘lishi bilan birga yer zaxini tortadi va yuqori hosil berishi bilan ajralib turadi. Bu o‘z navbatida iqtisodiy samaradorlikka olib keladi hamda mikroiqlimning atrofdagi cho‘l haroratiga nisbatan 1-2 ℃ pasaytiradi. Qahraton qishda esa ularning ortiqcha shox-shabbalari o‘tin vazifasini bajaradi.

- noqulay iqlim hukm surayotgan bir paytda cho‘llardagi ko‘chma qumlarni mustahkamlash uchun cho‘l o‘simliklaridan (saksovul, qandim, cherkez, quyonsuyak, iloq) fitomelioratsiya maqsadida foydalanish ko‘chma qumlarning oldini olishi bilan birga sizot suvlari sathining bir me’yorda turishini ta’minlaydi. Shuningdek chorva uchun ozuqa hisoblanadi.

- iqlim o‘zgarishinining salbiy ekologik muammolarini oldini olish maqsadida keng xalq ommasida ekologik madaniyatni shakllantirish;

- atmosfera havosini ifloslantiruvchi antropogen omillarni keskin kamaytirish;

- iqlim o‘zgarishiga bog‘liq xalqaro shartnomalarga qa’tiy rioya qilish;

- geokologik qonunlarning hayotga targ‘ibini ta’minlash, buning uchun o‘sib kelayotgan yosh avlodni bolaligidanoq vatanga, ona tabiatga nisbatan saxovatli qilib tarbiyalash;

- suv resurslaridan oqilona foydalanish va qishloq xo‘jaligida suvni tejash texnologiyasini qo‘llash(tomchilab sug‘orish);

- yoqilg‘i-energetika majmuasida chiqindi gazlar miqdorini kamaytirish;

- uy-joy, kommunal xo‘jaligida energiya samaradorligini oshirish, ya’ni noan’anaviy energiya manbalari (quyosh batareyalaridan) foydalanish va hokazo.

Yuqoridagi takliflar inobatga olinsa, O‘zbekiston sharoitida ayni paytdagi iqlimiy sharoitni uzoq muddat o‘zgartirmasdan saqlab turish bilan birga nisbatan qulay yashash sharoitiga erishiladi.

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RAQAMLASHTIRISH SHAROITIDA PEDAGOG KADRLAR TAYYORLASHDA DASTURIY-DIDAKTIK VOSITALARNING SAMARADORLIGI

Annotatsiya. *Ushbu maqolada raqamlashtirish sharoitida oliy pedagogik ta’lim tizimida pedagog kadrlar tayyorlash jarayonida dasturiy-didaktik vositalardan samarali foydalanish masalasi yoritilgan. Pedagogik jarayonning raqamli transformatsiyasi, elektron platformalar va interaktiv ta’lim resurslari asosida ta’lim sifatini oshirish imkoniyatlari tahlil qilinadi. Tadqiqotda zamonaviy raqamli vositalar turlari, ularni tanlash mezonlari, hamda ularning amaliy samaradorligi misollar asosida ochib beriladi. Muallif pedagogik faoliyatda raqamli kompetensiyalarni shakllantirishda ushbu vositalarning o‘rnini asoslaydi.*

Kalit so‘zlar*: raqamlashtirish, pedagog kadrlar, dasturiy-didaktik vositalar, raqamli ta’lim, elektron platformalar, raqamli kompetensiyalar.*

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EFFECTIVENESS OF SOFTWARE AND DIDACTIC TOOLS IN TRAINING TEACHING STAFF IN THE CONDITIONS OF DIGITALIZATION

Abstract. *This article explores the effective use of software-didactic tools in the training of pedagogical personnel within the context of digitalization in higher pedagogical education. It analyzes the opportunities to improve the quality of education through digital transformation of the teaching process, utilizing electronic platforms and interactive learning resources. The study highlights various types of modern digital tools, criteria for their selection, and their practical effectiveness through real-world examples. The author substantiates the importance of these tools in developing digital competencies among future educators.*

Keywords*: digitalization, pedagogical staff, software-didactic tools, digital learning, electronic platforms, digital competencies.*

Kirish. Bugungi kunda ta’lim tizimining barcha bosqichlarida, xususan oliy pedagogik ta’limda raqamli texnologiyalarni joriy etish davlat siyosatining ustuvor yo‘nalishiga aylangan [1]. Raqamlashtirish jarayoni nafaqat texnologik vositalarni qo‘llashni, balki ta’lim mazmunini, shakl va metodlarini tubdan yangilashni taqozo etmoqda [2]. Ayniqsa, pedagog kadrlar tayyorlash jarayonida zamonaviy dasturiy-didaktik vositalardan samarali foydalanish nafaqat ta’lim sifati va samaradorligini

oshiradi, balki bo‘lajak o‘qituvchilarning raqamli kompetensiyalarini shakllantirishda muhim omil sifatida namoyon bo‘lmoqda [3].

ASOSIY QISM. So‘nggi yillarda Moodle, Google Classroom, MS Teams, Edmodo kabi raqamli platformalar, shuningdek, interaktiv testlar, elektron darsliklar va videodarslar asosida dars jarayonlarini tashkil etish pedagogik amaliyotda keng yoyildi [4]. Shu bilan birga, bu vositalarning qaysi biri, qanday sharoitda va qanday metodik asosda qo‘llanilishi kerakligi, ulardan foydalanish samaradorligi, o‘qituvchi va talaba o‘rtasidagi raqamli muloqotning pedagogik mexanizmlari hanuzgacha chuqur o‘rganilishga muhtoj [5].

Mazkur maqolada oliy pedagogik ta’lim tizimida pedagog kadrlar tayyorlashda raqamli dasturiy-didaktik vositalardan foydalanishning nazariy asoslari, ularning turlari va afzalliklari, tanlash mezonlari, hamda amaliy samaradorligi yoritiladi. Tadqiqotning dolzarbligi raqamli transformatsiya sharoitida pedagogik faoliyatni takomillashtirishda bu vositalarning roli ortib borayotganida namoyon bo‘ladi [6].

Zamonaviy ijtimoiy-iqtisodiy sharoitda raqamli texnologiyalarning jadal rivojlanishi global miqyosda inson faoliyatining barcha sohalarini, xususan ta’lim tizimini transformatsiyalash jarayonini jadallashtirmoqda. Ta’lim sohasida yuz berayotgan ushbu o‘zgarishlar, ayniqsa, oliy pedagogik ta’limda raqamli muhitga moslashgan, raqamli kompetensiyalarga ega bo‘lgan kadrlarni tayyorlash zaruratini yuzaga keltirmoqda. Raqamlashtirish nafaqat axborot-kommunikatsiya texnologiyalarini texnik jihatdan tatbiq etish, balki ta’lim mazmuni, metodlari, vositalari hamda tashkiliy shakllarini tubdan yangilashni taqozo etayotgan integratsiyalashgan tizimli jarayondir [1].

Oliy ta’lim tizimini raqamlashtirishning asosiy mazmun-mohiyati ta’lim jarayonini oddiy raqamli shaklga o‘tkazish bilangina cheklanmaydi, balki u o‘quvchilarga yo‘naltirilgan, interaktiv, ochiq va moslashuvchan o‘quv muhitini shakllantirish orqali ta’lim samaradorligini oshirishga xizmat qiluvchi strategik yo‘nalish sifatida qaralmoqda. Bu yondashuv ayniqsa bo‘lajak pedagoglarni zamonaviy ta’lim talablariga muvofiq tayyorlashda muhim ahamiyatga ega bo‘lib, o‘qituvchilarda raqamli savodxonlik, axborot-kommunikatsiya texnologiyalaridan foydalanish ko‘nikmalari va raqamli kompetensiyalarni shakllantirishni talab etadi [2].

O‘zbekiston Respublikasida ham so‘nggi yillarda ta’lim tizimida raqamlashtirishni jadallashtirish borasida qator konseptual hujjatlar, davlat dasturlari va normativ-huquqiy asoslar ishlab chiqilgan. Jumladan, “Raqamli O‘zbekiston – 2030” strategiyasida oliy ta’lim muassasalarini raqamli infratuzilma bilan ta’minlash, ta’lim jarayonida elektron ta’lim platformalarini joriy etish, raqamli ta’lim kontentlarini yaratish va masofaviy ta’lim shakllarini rivojlantirish ustuvor vazifa sifatida belgilangan [3]. Bu esa pedagogik kadrlarni tayyorlashda raqamli vositalarni kompleks qo‘llash orqali ta’lim jarayonini modernizatsiyalash zarurligini ko‘rsatadi.

Xalqaro tajriba ham raqamlashtirishning ijobiy natijalarini isbotlamoqda. Jumladan, UNESCO tadqiqotlarida raqamli ta’lim texnologiyalari qo‘llanilganda

o‘quvchilarda mustaqil bilim olishga bo‘lgan motivatsiya kuchaygani, ularning o‘zlashtirish darajasi oshgani va individual o‘quv traektoriyalarini qo‘llab-quvvatlash imkoniyatlari kengaygani ta’kidlanadi [4]. Bundan tashqari, raqamlashtirish nafaqat dars jarayonini, balki bilimni baholash, nazorat qilish, individual yondashuvni amalga oshirish hamda o‘quvchilarning ijodiy faolligini oshirishga xizmat qiladi.

Shu munosabat bilan, pedagog kadrlarni tayyorlashda dasturiy-didaktik vositalarning ahamiyati tobora ortib bormoqda. Ularni o‘quv jarayoniga metodik asoslangan holda integratsiyalash, ta’lim mazmuni bilan uzviy bog‘lash va zamonaviy didaktik tamoyillar asosida qo‘llash natijasida oliy pedagogik ta’limda o‘qitish sifati va samaradorligi yangi bosqichga ko‘tariladi. Xususan, Moodle, MS Teams, Google Classroom kabi platformalardan foydalanish, raqamli darsliklar, videodarslar, testlar, elektron portfoliolar va monitoring tizimlarini joriy etish o‘qitish jarayonini interaktiv, o‘zaro muloqotga asoslangan va differensial yondashuvga yo‘naltirilgan shaklga aylantiradi [5].

Pedagog kadrlar tayyorlashda dasturiy-didaktik vositalar turlari *(ilmiy-uslubda boyitilgan variant)*

Zamonaviy pedagog kadrlarni tayyorlash jarayonida raqamli texnologiyalarni tizimli joriy etish ta’limning mazmuniy, metodik va tashkiliy jihatlarini tubdan qayta ko‘rib chiqishni talab qilmoqda. Bunda, ayniqsa, dasturiy-didaktik vositalarning roli alohida ahamiyat kasb etadi. Ushbu vositalar o‘quv jarayonining samaradorligi, interaktivligi va shaxsga yo‘naltirilganligini ta’minlovchi muhim komponentlar bo‘lib xizmat qiladi [1]. Dasturiy-didaktik vositalar deganda, pedagogik maqsadlarga erishishga xizmat qiluvchi raqamli platformalar, elektron o‘quv materiallari, metodik resurslar va monitoring tizimlari majmuasi tushuniladi.

Pedagogik ta’limda qo‘llanilayotgan dasturiy-didaktik vositalar funksional va metodik xususiyatlariga ko‘ra quyidagi asosiy toifalarga ajratiladi:

1. **Elektron ta’lim platformalari (LMS – Learning Management Systems)**

Mazkur vositalar o‘quv jarayonini rejalashtirish, tashkil etish, boshqarish va baholash imkonini beruvchi integratsiyalashgan raqamli tizimlardir. Jumladan, Moodle**,** Google Classroom**,** Canvas**,** Microsoft Teams kabi platformalar masofaviy va aralash ta’lim formatlarida keng qo‘llanilmoqda [2]. Ushbu tizimlar o‘qituvchiga interaktiv topshiriqlar tayyorlash, testlar yaratish, forumlar orqali muloqotni yo‘lga qo‘yish va talabalar faoliyatini avtomatlashtirilgan tarzda monitoring qilish imkonini beradi.

2. **Elektron darsliklar va raqamli o‘quv resurslari**

An’anaviy bosma darsliklarning raqamli muqobillari hisoblangan ushbu vositalar multimedia elementlari (video, audio, grafiklar, animatsiyalar) bilan boyitilib, o‘quvchilarning bilish faoliyatini faollashtirishga xizmat qiladi. Ular orasida PDF formatidagi darsliklar**,** prezentatsiyalar**,** interaktiv modullar**, va** virtual qo‘llanmalar mavjud bo‘lib, ular ta’lim jarayonini vizuallashtirishga yordam beradi [3].

3. **Interaktiv test tizimlari va baholash vositalari**

Ta’lim jarayonida oraliq va yakuniy baholashni interaktiv tarzda amalga oshirish imkonini beruvchi vositalar sifatida **Quizizz**, **Kahoot**, **Google Forms**, **Socrative** kabi servislar alohida ajralib turadi. Ular testlar, viktorinalar, reytinglar va avtomatik baholash mexanizmlarini taklif etadi. Bu vositalar bilimni baholash bilan bir qatorda o‘quvchilarda musobaqalashuv ruhini shakllantirib, o‘quv jarayonining dinamizmini oshiradi [4].

4. **Virtual laboratoriyalar va simulyatsiyalar**

Amaliy ko‘nikmalarni rivojlantirishda ayniqsa, aniq va tabiiy fanlar uchun virtual laboratoriyalar muhim ahamiyatga ega. Ular real tajribalarni raqamli muhitda takrorlash, eksperimentlarni xavfsiz va qulay sharoitda bajarish imkonini beradi. Masalan, PhET Interactive Simulations**,** Cisco Packet Tracer**, va** Virtual Labs simulyatsiyalari talabalarning tajriba asosida o‘rganish faoliyatini rivojlantirishda keng imkoniyatlar yaratadi [5].

5. **Videodarslar va onlayn ma’ruza platformalari**

Videodarslar o‘quv materiallarini vizual va eshitish orqali o‘zlashtirish imkonini yaratadi. YouTube**,** Coursera**,** Khan Academy**,** Masofaviy ta’lim portallari**,** va ZiyoNet kabi platformalarda joylashtirilgan darslar talabalar uchun mustaqil ta’lim olishi, materialni qayta ko‘rib chiqishi va shaxsiy tempda o‘zlashtirishi uchun qulay sharoit yaratadi.

6. **Raqamli metodik qo‘llanmalar va o‘qituvchilar uchun resurslar**

Bu vositalar dars jarayonini metodik jihatdan to‘g‘ri loyihalash va tashkil qilishda o‘qituvchiga ko‘maklashadi. Ularga dars ishlanmalari, didaktik materiallar, vizual taqdimotlar, o‘qitish ssenariylari, metodik tavsiyalar va analitik kuzatuv vositalari kiradi. Ular pedagogik jarayonni zamonaviy yondashuvlar asosida boshqarishga xizmat qiladi [6].

Ushbu vositalar o‘zaro bog‘liq va to‘ldiruvchi xarakterga ega bo‘lib, kompleks qo‘llanilganda pedagog kadrlarni tayyorlashda yuqori samaradorlikka erishish imkonini beradi. Dasturiy-didaktik vositalarni tanlashda ularning funksionalligi, didaktik mosligi, texnik imkoniyatlari, hamda foydalanuvchi interfeysi kabi mezonlarga e’tibor qaratilishi lozim. Bu vositalar ta’limning shaxsga yo‘naltirilganligi, moslashuvchanligi va interaktivligini kuchaytiruvchi asosiy omillardan biridir.

Adabiyotlar tahlili.

Pedagog kadrlar tayyorlashda dasturiy-didaktik vositalardan foydalanish masalasiga bag‘ishlangan ilmiy-adabiyotlar tahlili shuni ko‘rsatadiki, so‘nggi yillarda ta’limni raqamlashtirish, AKT vositalarini o‘quv jarayoniga integratsiyalash va raqamli kompetensiyalarni shakllantirish yo‘nalishida keng ko‘lamli nazariy va amaliy tadqiqotlar olib borilmoqda.

1. **Nazariy-uslubiy adabiyotlar**

Ushbu guruhdagi manbalar raqamlashtirish jarayonining mohiyati, asosiy tamoyillari, didaktik imkoniyatlari va raqamli texnologiyalarning ta’lim tizimiga ta’sirini yoritadi. Jumladan:

Subetto A.I. va **Molchanov A.V.** tomonidan yozilgan ishlar raqamli transformatsiya jarayonining falsafiy-pedagogik asoslarini yoritadi. Ular ta'limda raqamli texnologiyalarning faqat vosita emas, balki yangi o'quv muhitini shakllantiruvchi strategik resurs ekanini asoslaydi [1][2].

Selwyn N. asarida esa raqamli o'qitishning global tendensiyalari, ijtimoiy ta'siri, ijobiy va salbiy jihatlari tahlil qilingan. U interaktiv ta'lim vositalarining samaradorligini tanqidiy nuqtai nazardan baholaydi [3].

2. **Mahalliy tadqiqotlar va amaliy-uslubiy manbalar**

Ushbu adabiyotlar O'zbekiston ta'lim tizimida raqamli texnologiyalarning joriy etilishi, pedagoglar malakasini oshirish va platformalardan foydalanish tajribalarini aks ettiradi:

Xasanboyeva D.S., Turg'unov I.A., Baxtiyarov M.I. singari tadqiqotchilar tomonidan yozilgan maqola va monografiyalarda elektron platformalar (Moodle, Google Classroom), videodarslar, test tizimlari va boshqa vositalarning o'qituvchilarni tayyorlashdagi samarasi yoritilgan [4][5][6].

Ushbu ishlar, shuningdek, O'zbekiston oliy ta'lim tizimida raqamli vositalarni joriy etishda uchrayotgan metodik, texnik va tashkiliy muammolarni ham ko'rsatib beradi. Ba'zi hollarda maxsus raqamli kontent va metodik qo'llanmalar etishmasligi, o'qituvchilarning raqamli savodxonlik darajasi pastligi qayd etilgan.

3. **Xalqaro tashkilotlar va statistik-hisobot manbalari**

UNESCO, OECD va **World Bank** kabi xalqaro tashkilotlar tomonidan tayyorlangan hisobotlar raqamli ta'limning rivojlanish istiqbollari, o'qituvchilarning raqamli tayyorgarligi va global reytinglarda ilg'or tajribalarni tahlil etishda muhim manba hisoblanadi.

UNESCO (2022) hisobotida raqamli vositalar asosida o'qitish shaxsga yo'naltirilgan ta'lim, uzluksiz o'quv muhitini yaratish, o'quvchilar motivatsiyasi va o'zlashtirish samaradorligini oshirishdagi roli asoslab berilgan [7].

4. **Amaliy-tajriba manbalari va statistik materiallar**

Eksperimental guruhlar bilan olib borilgan **ichki universitet hisobotlari, so'rovnoma natijalari**, va **pedagogik kuzatuvlar** maqolada ilgari surilgan nazariy xulosalarni amaliy dalillar bilan mustahkamlab beradi. Ayniqsa, Andijon davlat universiteti va O'zbekiston Milliy universitetida o'tkazilgan tajribalar bu sohaning dolzarbligini tasdiqlaydi [8].

Umumiy xulosa:

Tahlil shuni ko'rsatadiki, hozirgi kunda ta'limni raqamlashtirish bo'yicha mavjud adabiyotlar ikki asosiy yo'nalishni qamrab oladi:

1) Raqamli texnologiyalarning didaktik imkoniyatlari va metodik asoslari (nazariy yondashuv);

2) Ularni amaliyotda samarali joriy etish yo'llari va real ta'lim muhitidagi tajribalar (amaliy yondashuv).

Ammo shuni ham ta'kidlash joizki, pedagog kadrlar tayyorlashga ixtisoslashgan milliy dasturiy-didaktik vositalar, lokal platformalar va metodik

qo‘llanmalarga bag‘ishlangan monografik tadqiqotlar hali yetarli emas**,** bu esa mavzuning dolzarbligini va ilmiy-tadqiqot imkoniyatlarini yanada kengaytiradi.

TADQIQOT METODI VA METODOLOGIYASI. Samaradorlik tahlili (nazariy va amaliy misollar asosida) Pedagog kadrlarni tayyorlashda raqamli dasturiy-didaktik vositalardan foydalanishning samaradorligi ko‘plab tadqiqotlar va amaliy tajribalar orqali isbotlangan. Ushbu vositalar o‘quv jarayonining sifatini oshirish, o‘qituvchilarning metodik tayyorgarligini kuchaytirish va talabalar bilimini chuqurlashtirishga xizmat qiluvchi muhim omillar sirasiga kiradi [1].

Nazariy jihatdan samaradorlik mezonlari quyidagilardan iborat:

Interaktivlik darajasi – o‘qituvchi va talaba o‘rtasidagi muloqotni faollashtiradi;

Shaxsga yo‘naltirilganlik – har bir talabaning individual o‘zlashtirish tezligi va uslubini hisobga olishga imkon beradi;

Monitoring va baholash qulayligi – talabalarning faolligi va bilim darajasini real vaqt rejimida nazorat qilish imkoniyatini yaratadi;

Moslashuvchanlik – o‘quv jarayonini istalgan joyda va istalgan vaqtda tashkil etish imkonini beradi;

Didaktik ko‘maklashuv – o‘qituvchining yuklamasini yengillashtiradi, dars materiallari va metodik resurslarni tizimli taqdim etadi [2].

Amaliy tajriba misollari:

1. Eksperimental sinov: Chirchiq davlat pedagogika universiteti Matematika va informatika fakultetida olib borilgan tajriba-sinov tadqiqotlari shuni ko‘rsatdiki, Hemis platformasi asosida dars olib borilgan eksperimental guruhda ta’lim samaradorligi sezilarli darajada oshgan. 60 nafar talaba ishtirok etgan eksperimentda:

Eksperimental guruh (30 talaba) – raqamli platforma va interaktiv vositalar asosida o‘qitildi;

Nazorat guruhi (30 talaba) – an’anaviy o‘qitish shaklida darslarda qatnashdi.

Dastlabki test natijalarida ikki guruh o‘rtasida katta farq kuzatilmagan bo‘lsa-da, yakuniy test natijalarida eksperimental guruhda o‘rtacha ball **84.5**, nazorat guruhida esa **68.7** bo‘lgan, bu esa **+23.1%** o‘sishni ko‘rsatdi [3].

2. Talabalar fikr-mulohazalari: Jizzax davlat pedagogika universitetida o‘tkazilgan so‘rovnoma natijalariga ko‘ra, talabalar orasida raqamli darsliklar, test tizimlari va videodarslarga nisbatan yuqori qiziqish mavjud bo‘lib, 78% talaba raqamli vositalar orqali dars o‘rganish an’anaviy metodlarga nisbatan samaraliroq ekanligini bildirgan.

3. Xalqaro tajriba: Finlyandiya, Estoniya va Janubiy Koreya ta’lim tizimlarida o‘qituvchilarni tayyorlashda virtual laboratoriyalar va LMS tizimlaridan doimiy foydalanish odatiy holga aylangan. Bu davlatlar ta’lim reytinglarida yuqori o‘rinlarni egallashi ushbu yondashuvning samarali ekanligini ko‘rsatadi [4].

Ushbu faktlar raqamli vositalardan foydalanish faqatgina darslarni zamonaviylashtirish emas, balki o‘quvchi va o‘qituvchi o‘rtasidagi munosabatlarni yangi bosqichga olib chiqishini, o‘zlashtirish darajasini sezilarli darajada oshirishini yaqqol isbotlaydi.

Xulosa va takliflar.

O‘zbekiston Respublikasi oliy ta’lim tizimining raqamlashtirilishi ta’lim sifatini oshirish, ochiqlik, shaxsga yo‘naltirilganlik va innovatsion yondashuvlar asosida pedagogik faoliyatni takomillashtirishni taqozo etmoqda. Mazkur maqolada pedagog kadrlar tayyorlash jarayonida dasturiy-didaktik vositalardan foydalanishning nazariy asoslari, ularning tarkibiy turlari hamda amaliyotda qo‘llanilishi natijasida yuzaga keladigan samaradorlik ko‘rsatkichlari tahlil qilindi. Tadqiqotning nazariy va amaliy natijalari quyidagi asosiy ilmiy xulosalarni shakllantirish imkonini berdi:

Raqamli ta’lim texnologiyalarining integratsiyalashuvi pedagogik faoliyatni zamonaviylashtirish, metodik vositalarni diversifikatsiyalash va o‘qituvchilarning raqamli kompetensiyalarini shakllantirishda muhim vosita sifatida namoyon bo‘lmoqda. Ularning to‘g‘ri tanlanishi va pedagogik maqsadga muvofiq qo‘llanilishi o‘quv jarayonining sifat ko‘rsatkichlarini sezilarli darajada oshiradi.

Dasturiy-didaktik vositalarning turlari — elektron platformalar, raqamli darsliklar, interaktiv test tizimlari, virtual laboratoriyalar, videodarslar va metodik qo‘llanmalarning o‘zaro integratsiyasi pedagogik ta’limda innovatsion o‘qitish muhitini shakllantirishga xizmat qiladi. Har bir vositaning didaktik funksionalligi o‘ziga xos afzalliklarga ega bo‘lib, ular ta’limning shaxsga yo‘naltirilgan, faol, reflektiv va differensial xarakterini ta’minlaydi.

Eksperimental tadqiqotlar natijalari asosida raqamli vositalardan foydalanilgan guruhlarda talabalar faolligi, o‘zlashtirish darajasi, o‘quv materiallariga qiziqishi va mustaqil ta’limga bo‘lgan motivatsiyasi an’anaviy usullarga qaraganda yuqori ekanligi aniqlandi. Bunda raqamli vositalarning didaktik yondashuvlar bilan uyg‘unlashganligi asosiy rol o‘ynagan.

Xalqaro tajriba va taqqoslov tahlillar shuni ko‘rsatadiki, ta’limda raqamlashtirish jarayonining muvaffaqiyatli yo‘lga qo‘yilishi uchun texnologik infratuzilma, sifatli o‘quv kontenti, pedagogik dizayn, o‘qituvchilarning raqamli madaniyati va metodik tayyorgarligi hal qiluvchi omillar hisoblanadi.

Shuningdek, dasturiy-didaktik vositalarning muvaffaqiyatli joriy etilishi ta’lim tizimida **moslashuvchan, ochiq, uzluksiz va samarali o‘quv muhiti**ni shakllantirishga xizmat qilishi bilan birga, raqamli tengsizlik, texnik cheklovlar va pedagogik tayyorgarlik darajasidagi nomutanosibliklar kabi muammolarni ham yuzaga chiqarishi mumkin. Shuning uchun bunday vositalarni joriy etishda strategik yondashuv muhim ahamiyatga ega.

Takliflar: Metodik-pedagogik yondashuvni takomillashtirish: Oliy pedagogik ta’lim muassasalarida dasturiy-didaktik vositalarni qo‘llashga doir ilmiy asoslangan metodik qo‘llanmalar, o‘quv kurslari va milliy platformalarni ishlab chiqish va tatbiq etish lozim.

Raqamli kompetensiyalarni shakllantirish: Pedagogik kadrlar tayyorlov dasturlariga AKT vositalaridan foydalanish, raqamli kontent yaratish, LMS tizimlarini boshqarish bo‘yicha majburiy modul va amaliy mashg‘ulotlarni kiritish tavsiya etiladi.

Ilmiy-metodik tadqiqotlarni kengaytirish: Dasturiy-didaktik vositalarning ta’lim sifati va samaradorligiga ta’siri bo‘yicha uzluksiz monitoring, taqqoslovli tahlillar va eksperimental tadqiqotlarni amalga oshirish zarur.

O‘quv infratuzilmani modernizatsiyalash: Har bir pedagogik ta’lim muassasasida yagona raqamli muhit (platforma, elektron kutubxona, test tizimi, tahlil modullari)ni shakllantirish orqali integratsiyalashgan ta’lim tizimi yo‘lga qo‘yilishi kerak.

Tizimli yondashuv asosida baholash: Raqamli vositalar asosida ta’lim sifatini baholashda learning analytics, adaptiv testlash va tahliliy hisobotlarni pedagogik qarorlar qabul qilishda qo‘llash mexanizmini yaratish lozim.

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DIETILAMINNING FOSFATLI TUZINI KORROZIYA INGIBITORLIK HUSUSIYATLARI

Annotatsiya. *Ushbu maqolada dietilaminning fosfatli tuzini rentgen difraktogrammasi, IQ-spektrlari hamda gravimetrik usullar asosida korroziya tezligi, tormozlanish koeffisienti, himoyalash darajasi aniqlandi.*

Tayanch so‘zlar. *Rentgen, dietilaminfosfat, IQ-spektr, gravimetriya, korroziya, tormozlanish koeffisienti, himoyalash darajasi, korroziya tezligi.*

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CORROSION INHIBITOR PROPERTIES OF DIETHYLAMINE PHOSPHATE SALT

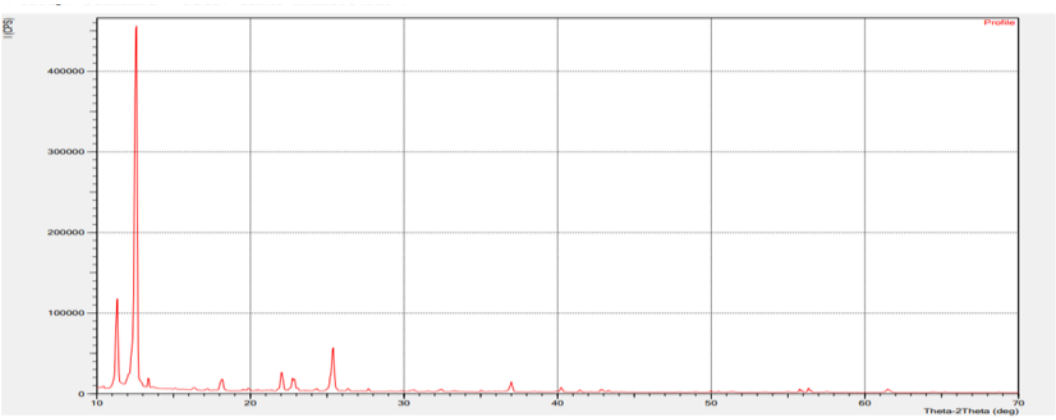
Annotation. *In this article, the corrosion rate, inhibition efficiency, and protection degree of diethylamine phosphate salt were determined based on X-ray diffraction patterns, IR spectra and gravimetric methods.*

Keywords: *X-ray, diethylamine phosphate, IR spectrum, gravimetry, corrosion, inhibition efficiency, protection degree, corrosion rate.*

Korroziya doimiy jarayon bo‘lib, uni to‘xtatib bo‘lmaydi, lekin turli xil himoyalash usullari yordamida sekinlashtirish yoki kamaytirish mumkin. Biroq, ishlatiladigan ingibitorlarning aksariyati iqtisodiy jihatdan samarasiz hamda odamlar va atrof-muhit uchun zaharlidir. Shu sababli, ekologik toza yondashuvlar va xavfsizlik yechimlariga asoslangan yangi ekologik toza va kamroq zaharli korroziya ingibitorlarini topish kerak. Fosfonatlarning suvli muhitda po‘lat korroziyasini ingibirlash qonuniyati haqida to‘plangan daliliy faktlar shulardan iboratki korroziya ingibitorlarini samarasini oshirish va tannarxini kamaytirish yo‘llarini aniqlashga imkon beradi [28]. Ingibitorlar kuchsiz kislotali va neytral muhitlarda po‘latni eritish jarayonida yuqori samaradorligini ko‘rsatgan. Ushbu jarayonda polifosfatlar, pirofosfatlar va polielektrolitlarning o‘ziga xos xususiyatlari mavjud. Ular past kontsentratsiyada tannarxi arzon, ko‘p komponentli, zaharli emas, shuningdek mahalliy homashyo asosida olish mumkin bo‘lgan samaradorli ingibitorlar bo‘lib, himoyalash mexanizmida temir ionlari bilan kam eriydigan birikmalar hosil qilishidan iborat. [35].

Tadqiqot ob’yektlari sifatida dietilaminning fosfatli tuzi (DEAF) namunalari ingibitorlar sifatida olingan. Po‘latning korrozion xususiyatlarini o‘rganish uchun plastinka shaklidagi po‘lat 3 va 45 namunalari qo‘llanildi. Po‘lat namunalarining

korroziyaga uchrashi va uni himoya qilishda kislotali, ishqoriy va suvli muhitlarda hamda ingibitorlarning ta'sir etishi elektrokimyoviy va gravimetrik usullarda korrozion tadqiqotlardan keyin massaning kamayishiga tayangan holatda olib borildi.



1.1-rasm. Dietilaminning fosfatli tuzini rentgen difraktogrammasi.

1.1-rasmda dietilaminning fosfatli tuzini rentgen difraktogrammasi va 1.1-jadvalda ular asosida olingan parametri qiymatlari xisoblab ko'rsatilgan. Tajriba difraktometrda o'tkazildi xona haroratida nurlanish, grafit monoxromator, ω skanerlash, $2\theta_{max}$=124,50°. Kristall tuzulishga ega bo'lgan qattiq moddalarni o'rganish uchun rentgen nurlari diffraktsiyasi usullari qo'llaniladi.

1.1-jadval. Dietilaminning fosfatli tuzini rentgen diffraktogrammasi asosida olingan parametri qiymatlari

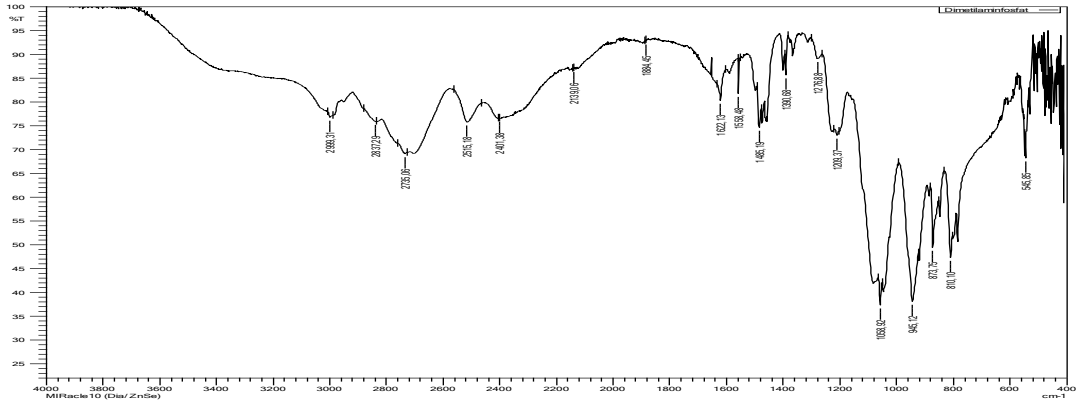
T/r	*2Theta[°]*	$\cos\theta = \frac{2\theta}{2}$	*FWHM* $\beta = rad$	*K*	*λ*	d $= \frac{K\lambda}{\beta\cos\theta}$	d = *umum*
1	11.1415	5.5707	0.1680	0.9	*0.54Å*	0.5193	d_{um}=0.3478
2	11.3971	5.6885	0.3046	0.9	*0.54Å*	0.2805	
3	12.0365	6.0182	0.2912	0.9	*0.54Å*	0.2773	
4	12.5340	6.2670	0.1904	0.9	*0.54Å*	0.4073	
5	12.7207	6.3603	0.1290	0.9	*0.54Å*	0.5923	
6	12.9498	6.4749	0.0921	0.9	*0.54Å*	0.8149	
7	13.4427	6.7213	0.2096	0.9	*0.54Å*	0.3449	
8	18.1999	9.0999	0.3119	0.9	*0.54Å*	0.1712	
9	22.0796	11.0398	0.2960	0.9	*0.54Å*	0.1487	
10	22.8518	11.4259	0.3135	0.9	*0.54Å*	0.1357	

Ushbu usul kristall jismlarning atom tuzilishini o'rnatishning samarali usuli bo'lib, kristallar strukturaning qat'iy davriyligiga ega va tabiatning o'zi tomonidan yaratilgan rentgen nurlari uchun difraksion panjarani ifodalaydi.

1.2-rasmda dietilaminfosfat tuzining IQ-spektrida 2999,31-2837,29 sm^{-1} sohalarda assimmetrik, 2735,06 sm^{-1} sohada esa simmetrik C-H bog'iga tegishli

intensivligi past tebranishlar; 2515,18-2401,38-2139,06 sm^{-1} sohalarda to‘rtlamchi azot atomining borligidan dalolat beruvchi chastotalar; 1558,48-1622,13 sm^{-1} sohalarda (N^{+}) ga tegishli deformatsion tebranishlar; 1276,88 sm^{-1} sohada –P=O ga tegishli bo‘lgan valent tebranishlar; 1485 sm^{-1} sohada C-H ga tegishli bo‘lgan deformatsion assimmetrik tebranishlarni, 1390,68 sm^{-1} esa C-H ga tegishli bo‘lgan defarmatsion o‘zgaruvchan simmetrik tebranishlarni ko‘rish mumkin. 1209,38 sm^{-1} sohada C-N-C bog‘ga tegishli bo‘lgan sohada simmetrik, 1058,92 sm^{-1} sohada esa C-N-C bog‘ga tegishli bo‘lgan assimmetrik signallar ko‘rindi; 873,75 sm^{-1} sohada P-O-P bog‘ga; 810,10 sm^{-1} sohada (P-H) mavjudligi hamda 545,85 sm^{-1} chastotada (NNN) borligi aniqlandi.

Tadqiqot ob’yektlarining fon eritmalardagi optimal konsentratsiyasini aniqlash uchun ingibitorlarning turli konsentratsiyalarida tadqiqotlar olib borildi. Gravimetrik usuldan foydalanib 15 kundan 30 kun davomida ingibitorlarning ta’sir qilish davomiyligi aniqlandi.



1.2-rasm. Dietilamin fosfat tuzining IQ-spektri.

Xulosa. Tadqiqotdan olingan natijalar turli fon eritmalarda olib borilgan bo‘lib, korroziya tezligi, tormozlanish koeffisienti (γ), himoyalash darajasi (Z) aniqlandi. Azot va fosfor tutgan yashil ingibitorlar metallar korroziyasini susaytirishi va yuqori samaradorlikka egaligi, ingibitor ta’sirining davomiyligi hisobiga ximoyalanish yanada ortishi kuzatildi. Bundan ingibitor sifatida qo‘llanilgan birikmalar metall sirtlari hamda korroziyaga uchratuvchi muhitlarning faol zarrachalari bilan ta’sirlanishida yuqori himoyalash darajasiga ega ekanligini tushuntirish mumkin.

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NATRIY-KARBOKSIMETILSELLULOZANING FOSFORLI BIRIKMALARI ASOSIDAGI INGIBITORLARNING FIZIK-KIMYOVIY XOSSALARI

Annotatsiya. *Ushbu maqolada metallarni korroziyadan samarali himoyalaydigan natriy-karboksimetilselluloza dietilamin va anilinning fosforli hosilalari ingibitor sifatida qo‘llanilgan. Natriy-karboksimetilselluloza va fosfor tutgan birikmalar asosidagi ingibitorlarni korroziya jarayonida metallarni himoyalash ta’sir mexanizmi taklif qilingan. Yuqori samaradorli ingibitorlarni himoyalash darajasi, tormozlash koeffisienti hamda qo‘llanilishda turli konsentratsiyalardagi optimal sharoitlari aniqlangan.*

Tayanch so‘zlar. *korroziya, ingibitor, natriy-karboksimetilselluloza, komponent, fosfor, anilin dietilamin, fosfat kislota, natriy tripolifosfat, po‘lat.*

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"PHYSICOCHEMICAL PROPERTIES OF INHIBITORS BASED ON PHOSPHORUS-CONTAINING COMPOUNDS OF SODIUM CARBOXYMETHYLCELLULOSE."

Abstract. *In this article, phosphorus-containing derivatives of diethylamine and aniline based on sodium carboxymethyl cellulose are used as inhibitors that effectively protect metals from corrosion. A mechanism of action is proposed for inhibitors based on sodium carboxymethyl cellulose and phosphorus-containing compounds in the process of metal corrosion protection. The degree of protection provided by the highly effective inhibitors, the inhibition efficiency coefficient, as well as the optimal conditions for their application at various concentrations, have been determined.*

Keywords: *corrosion, inhibitor, sodium carboxymethylcellulose, component, phosphorus, aniline, diethylamine, phosphoric acid, sodium tripolyphosphate, steel.*

Odatda metallar karroziya sababli vaqt o‘tishi bilan tabiiy holatini yo‘qotadi hamda bu atrof muhitning ifloslanishiga olib keladi. Buning oldini olish maqsadida yangi samaradorli yuqori bo‘lgan ingibitorlar ishlab chiqarish dolzarb vazifalardan biri hisoblanadi. Neytral muhitda Na-KMS natriy pirofosfat bilan ikki komponentli ingibitorlar sifatida foydalanilganda korroziyadan himoyalanish darajasi 96,83% gacha etganligi aniqlangan. Pirofosfat va uniflok asosidagi ikki komponentli

ingibitorlar bir xil yuqori himoyalash darajasiga ega, bu erda Z=97,64% ga yetganligi mualliflar olib borgan ishlaridan ma’lum [1].

Natriy-karboksimetilsellulozaning ingibitorlik xossasi eng yuqori bo‘lgan birikmalardan biri ekanligi va boshqa birikmalardan ajralib turishi aniqlangan. Samaradorligi eksperimental ravishda o‘rganilgan hamda Na-KMS va eritmadagi boshqa ionlar o‘rtasidagi o‘zaro ta’sir molekulyar dinamika simulyatsiya usullari yordamida o‘rganilgan. Tajriba natijalariga ko‘ra, Na-KMS qo‘shilishi bilan korroziya
sezilarli darajada kamayishi aniqlangan. Ushbu ma’lumotlar olingan natijalardagi korroziya tokining kamayishi bilan izohlab tushuntirishgan [2].

Tadqiqot ob’yektlari sifatida Na-KMS va fosfor tutgan birikmalar tanlab olindi. Po‘lat namunalarining korroziyaga uchrashi va uni himoya qilishda kislotali va ishqoriy muhitlarda hamda ingibitorlarning ta’sir etishi elektrokimyoviy va gravimetrik usullarda korrozion tadqiqotlardan keyin massaning kamayishiga tayangan holatda olib borildi.

Natijalar va muxokama. Ingibitorlarni himoyalash xususiyati ayrim metallarda
-NH_2, =NH, CN, N=O, C=C, –C=O, OH, P–O-H, P=O, COO^- funktsional guruh tutgan birikmalarda kuchliroq ekanligi oldindan ma’lum [3]. Rentgen fazaviy analiz usuli kristalllarning atom tuzilishini o‘rganishning eng muvaffaqiyatli xisoblanaib, kristallar strukturaning qat’iy davriyligiga ega va yaratilgan rentgen nurlari uchun difraksion panjarani ifodalaydi.

1-jadval. Natriy-karboksimetilsellulozaning fosfat kislotasi bilan hosilasining rentgen diffraktogrammasi asosida olingan parametri qiymatlari

T/r	*2Theta[°]*	$cos\,\theta = \frac{2\theta}{2}$	*FWHM* $\beta = rad$	*K*	λ	$d = \frac{K\lambda}{\beta\, cos\,\theta}$	$d = umum$
1	12.4843	6.4221	0.8834	0.9	*0.54Å*	0.0857	d_{um}=0.1865
2	13.3306	6.6653	0.9500	0.9	*0.54Å*	0.0767	
3	14.2772	7.1386	0.3900	0.9	*0.54Å*	0.1746	
4	15.3739	7.6869	0.5100	0.9	*0.54Å*	0.1239	
5	15.8680	7.9340	0.8909	0.9	*0.54Å*	0.0687	

O‘tkazilgan tadqiqotlar natijasida yanada samarali birikmalar aniqlanib, ularni kiritilishi natijasida fon eritmasida korrozion faollikni pasaytirishi va po‘latni korroziya natijasida yemirilishdan 90,46–92,58% himoyalagani kuzatildi.

2-jadval. Po‘lat 45 namunalarining 25°C 3% pH=5,3 (5%Na_2SO_4 + 3%H_2SO_4) fon eritma tarkibida turli ingibitorlarni (C=30 mg/l) miqdorda himoyalash darajasini gravimetrik usuldagi aniqlash natijalari

Ingibitorlar	15 kunlik natija				30 kunlik natija			
	K,g/(m^2 sut)	П	γ	Z, %	K,g/(m^2 sut)	П	γ	Z, %
Fon-1 (pH=5,3)	2,61	$4,99\cdot10^{-3}$	-	-	2,43	$9,6\cdot10^{-5}$	-	-
$(C_2H_5)_2NH\cdot H_3PO_4$	0,31	$6,07\cdot10^{-4}$	8,23	87,83	0,28	$1,11\cdot10^{-3}$	8,4	87,15
Na-KMS·H_3PO_4	0,27	$5,22\cdot10^{-4}$	9,6	89,55	0,23	$8,89\cdot10^{-4}$	10,4	90,46
$C_6H_5NH_2\cdot H_3PO_4$	0,24	$4,71\cdot10^{-4}$	10,6	90,57	0,20	$7,84\cdot10^{-4}$	11,8	91,58
Na-KMS·$Na_5P_3O_{10}$	0,21	$4,05\cdot10^{-4}$	12,3	91,88	0,18	$6,94\cdot10^{-4}$	13,4	92,58

Bir vaqtning o‘zida bir qancha funksional guruhlarni bo‘lishi sinergizm effektini kuzatilishi va ingibirlanish natijasida yuqori samaradorli ingibitorlar qatoriga ikkinchi komponnentli birikmalardan fosfor asosidagi amino guruh tutgan ingibitorlarni kiritishimiz mumkin [4]. Ushbu ma’lumotlar elektrokimyoviy usullar bilan ham tasdiqlandi. Natriy-karboksimetilselluloza va fosforli birikmalar asosidagi samaradorligi yuqori bo‘lgan korroziya ingibitorlari aniqlandi. Olib borilgan elektrokimyoviy, gravimetrik tadqiqotlar asosida korroziya tezligi, tormozlash koeffitsiyenti, himoyalash darajasi kabi parametrlar hamda organik birikmalarni ikkinchi komponent bilan qo‘llaganda optimal harorat va konsentratsiya aniqlandi.

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ELECTRICITY WASTAGE IN ELECTRICAL NETWORKS

Abstract*. This paper examines the phenomenon of electricity wastage in electrical networks, including overhead and cable lines, as well as power transformers. It explores both active and reactive power losses that occur during electricity transmission and distribution. The study provides formulas and methodologies for calculating these losses in three-phase alternating current systems and highlights the impact of various factors, such as load variations and compensation equipment. The paper also presents empirical data on power transformer losses and offers a detailed example of loss calculation for a specific transformer type. Effective monitoring and optimization strategies are emphasized as key approaches to improving network efficiency.*

Keywords: *electricity wastage, power loss, active power, reactive power, electrical networks, transmission lines, power transformers, compensation equipment, Uzbekistan power system, energy efficiency.*

Loss of electricity in electrical networks, air and cable lines, and transformers.Types of wastage.

Electricity loss in electrical networks, overhead and cable lines and transformers. Types of losses. Active losses. Reactive losses. Waste of electrical energy in electrical networks, air and cable lines, transformers. Types of waste.

Active and reactive capacities are required for normal electricity consumption. Reactive power is used to generate a magnetic field, and its production does not require the use of a primary energy resource. However, transmission via lines is associated with a certain active waste in network elements. Losses on the line when installing the compensating equipment

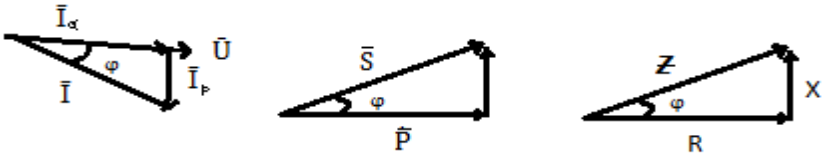
$$\triangle P = \frac{P^2+Q^2}{U^2}R \quad \text{and} \quad \triangle Q = \frac{P^2+Q^2}{U^2}x \quad \text{of value} \qquad (1)$$

$$\triangle P = \frac{P^2+(Q-Q_{ku})^2}{U^2}R \text{ and } \triangle Q = \frac{P^2+(Q-Q_{ku})^2}{U^2}x \text{ value decreases.} \qquad (2)$$

Loss of active and reactive capacities in three-phase alternating current lines, if we do not take into account the line conductivity (B = 0, G = 0):

$\triangle P = 3I^2*R = 3*(I_a^2 + I_p^2)*R$ $\triangle Q = 3I^2*X = 3*(I_a^2 + I_p^2)*X$ (3,4)

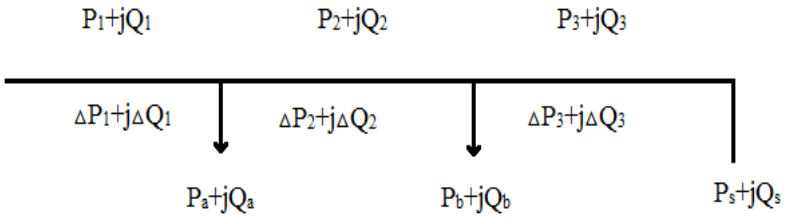
where R and X are the values of active and reactive constituents of line I and Ip with full and inductive resistance of line I.



a) b) c)

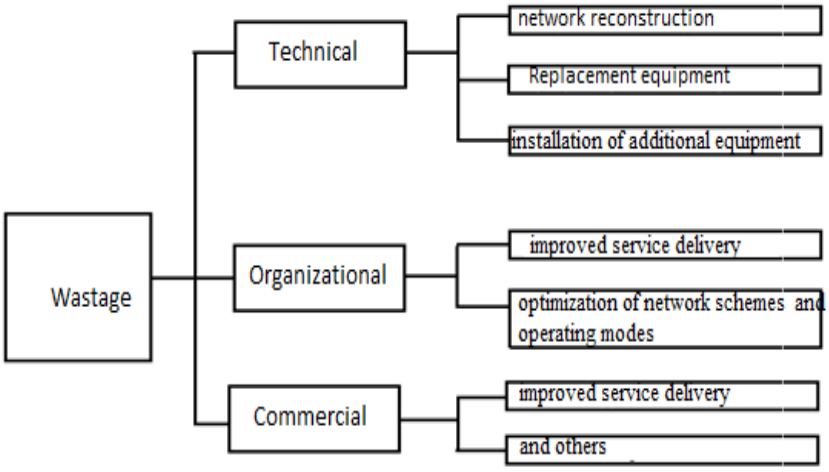
a- electricity, b- power, c- resistance triangles

The power loss on a line with multiple loads is the sum of the power losses per site.



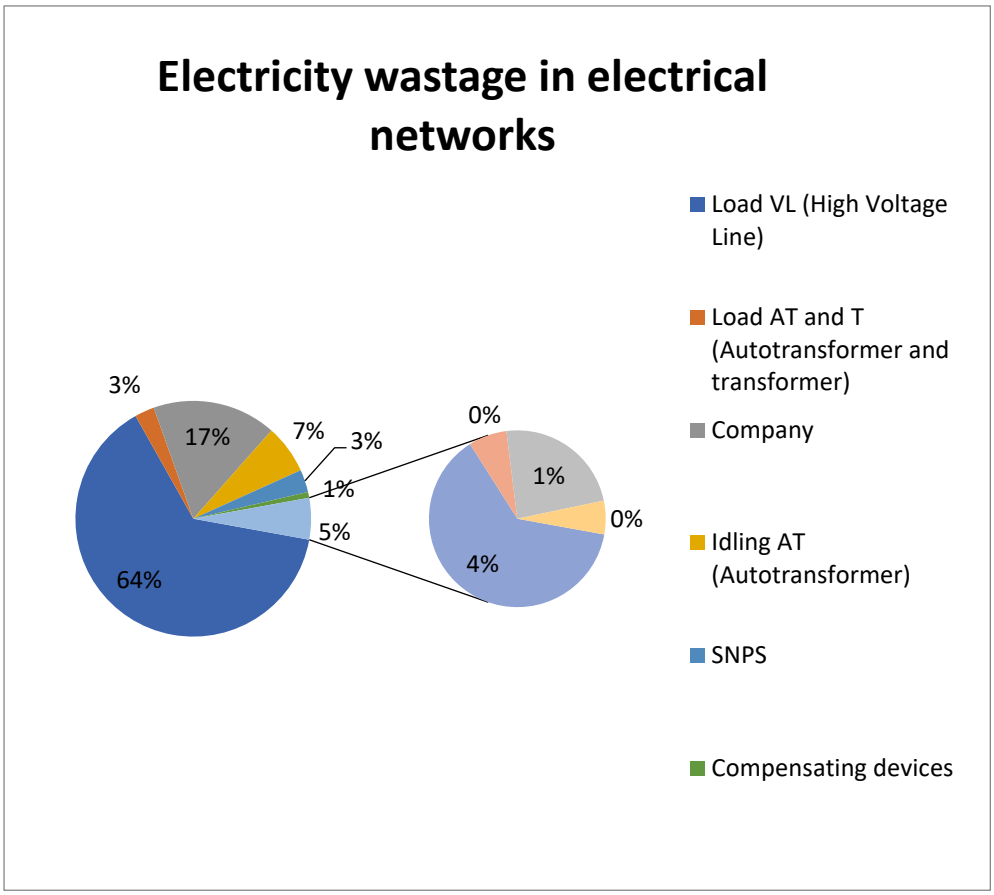
$$\triangle P\Sigma = \triangle P_1+\triangle P_2+\triangle P_3+\ldots.+\triangle P_n \quad (5)$$

$$\triangle Q\Sigma = \triangle Q_1+\triangle Q_2+\triangle Q_3+\ldots.+\triangle Q_n \quad (6)$$



Energy loss mitigation measures are implemented during design and operation. Operation activities are always performed during the mode optimization.

Increased bandwidth increases network load. Changes in active and reactive loads of consumers cause changes in both the active and reactive power flows and wastage in the power system. Therefore, it is important to constantly monitor the level of wastage as they determine the overall network performance. A systematic approach to waste management is a complex issue and can be solved only through the use of modern economic and mathematical models and computers. The main difficulty here is the collection and processing of network status data as they are constantly changing as the load changes.



With the development of electric networks and large industrial consumers, the need for reactive power compensation in the EPS of Uzbekistan will increase. It is necessary to cancel that at present various and highly effective compensating devices (CC) are widely used in developed EPS of foreign countries: static, consisting of capacitors and inductances regulated by thyristors; synchronous - longitudinal transverse regulation and - conventional compensators. The duration of the first is within 1-3 periods (0.02-0.06 seconds) and the second is 0.1-0.5 seconds. Moreover, both types of KU can operate as in the mode of reactive power output. The unit capacities of the above-mentioned KU are in the range of 5-600 MVAr.

Inputs of synchronous compensators in Uzbekistan EPS Table.1

Name of Substation	KU installation on 01.01.07, шт X MBAp	KU power input, pcs X MVAr			
		2008-2010 yy.	2011-2015 yy.	2016-2020 yy.	Total
Khorezm	2x50	-	-	-	-
Ferghana	2x50	-	-	-	-
Uzgarish	1x50	-	-	-	-
Samarkand	1x50	-	-	-	
Sogdiana	-	-	2x100	-	2x100
Namangan	-	-	2x50	-	2x50
Total SK	6x50	-	2x100 2x500	-	2x100 2x50

Losses in power transformers of substations Table.2

Rated power, kVA	Rated voltage VN / NN, kV	Short circuit voltage,%	Loss XX, W	Short circuit losses, 750s, W	Noise level dB
250	10/0.4	6	730	3400	53
315	10/0.4	6	360	5000	55
400	10/0.4	6	1000	5700	55
500	10/0.4	6	1150	6100	56
630	10/0.4	6	1400	6600	56
850	10/0.4	6	1800	7700	58
1000	10/0.4	6	1950	8800	59
1250	10/0.4	6	2300	10500	60
1600	10/0.4	6	2750	12700	61
2000	10/0.4	6	3200	15500	62
2500	10/0.4	6	4200	19000	64

Methodology and example of calculating electricity losses

In practice, the following methods are used to determine losses:

- carrying out operational calculations;
- daily criterion;
- calculation of average loads;
- analysis of the largest losses of transmitted power in the context of day-hours;
- appeal to generalized data.

Full information on each of the above methods can be found in regulatory documents.

In conclusion, we give an example of calculating costs in a TM 630-6-0,4 power transformer, the calculation formula and its description are given below, it is suitable for most types of similar devices.

△WT=△WXX+(△W_H^1* WT/100) kWh, where

△WXX=△PXX*TO*(U1/Uном)2 – loss of idle power transformer, kW * h;△W_H^1= (△WX/WT)*100% - relative load losses of the power transformer,%

△WH=КК*△Pcp*TP* $К_{ф}^{2}$ – load losses of the power transformer, kW * h.

$К_{ф}^{2}$=(1+2Кз)/3Кз – the square of the coefficient of the form of the graph for the billing period, cu;

Кз= [WT/(Sн* TP* $\cos_{\varphi}$)]*10-3 - load factor of the transformer (filling schedule), cu;

△Pcp= 3*I_{cp}^{2}*R*10-3 – power losses in a power transformer, kW;Icp= WT/($\sqrt{3}$ *Ucp* TP* $\cos_{\varphi}$) - average load for the billing period, A;

R = (△ Pkz * U_n^ 2 / S_nom ^ 2) * 10-3 active resistance of the power transformer, Ohm;

Kk - coefficient taking into account the difference in the configurations of the graphs of the active and reactive loads (reference value, taken equal to 0.99),

Table.3

$S_{нт}$	Transformer rated power, MVA.	0,63
$U_{ном}$	Rated voltage, kV.	6
W_T	Consumed active electricity per month, kW * hour.	37108
$\triangle P_{XX}$	Transformer idle power loss, kW.	1,31
$\triangle P_{кз}$	Short circuit power loss, kW	7,6
T_P	The number of hours of operation of the transformer under load for the billing period, hour;	720
T_O	Transformer connection time for the billing period to the network, hour;	720
$К_к$	Coefficient of differences in configurations;	0,99
$\cos_{\varphi}$	Transformer average power factor	0,9

Now we proceed to the calculation.

△ WXX = 1001.0 kW / h; K_ ^ ^ 2 = 4.33; C3 = 0.09; R = 0.69 ohm;

△ Wн = 182.20 kW / h; Iav = 5.34; △ Rav = 0.06;

△ W_H ^ 1 = 0.491, as a result, the calculated value will be equal to 1001.0 kW / h + 0.49%

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ANALYSIS OF HIGH-VOLTAGE SUBSTATIONS PROCESSES USING MULTIFUNCTIONAL RADIOMER DEVICES, PREVENTING ACCIDENTS AND ACHIEVING ECONOMIC EFFICIENCY

Annotation: *Currently, the reduction of electricity costs is one of the pressing issues. The current technical and organizational problems in the electricity metering system, a number of topical issues related to the sufficiently efficient power distribution networks, and the reliability of electricity transmission lines and transformers. Introduction of automated information systems for real-time monitoring of network modes, prevention of possible accidents and effective solutions to these problems. Possibility of receiving information from the substation temperature, gas protection, object protection, fire safety (sensors) and sending this information via SMS with Radiomer Intelligent System log.*

Keywords: *electricity, distribution networks, metering systems, modes, alarm systems, automated information systems,mechnology, reliability.*

The energy efficiency of the use of electrical energy is a quantitative assessment of the process, which characterizes the level of technology used for the conversion, production, transmission and distribution of electrical energy. Indicators of energy efficiency of production, transmission and distribution of electric energy are the total specific fuel consumption by electric power system (EPS) in the regulated conditions of its operation, the absolute or relative normalized value of the total losses of electric energy and the regulatory environmental parameters of the system as a whole. At the present stage of electric power industry development, an improvement of energy efficiency in generation, transmission and distribution of electric power is are critical task for electric power system (EPS) of each country. This task is especially important for Uzbekistan, which has majority of energy-intensive generating equipment, put intro operation in 1960s-70s.

Energy efficiency in application of electric power – is a quantitative assessment of the process, which shows level of technology used for transformation, generation,transmission and distribution of electric power. Indication of energy efficiency in generation and distribution of electric power are total specific fuel consumption within EPS, under regulated terms of its work, absolute or relative standardized value of total waste of total of electric power and standard environmental parameters of electric power system, as a whole[1].

The development of the energy sector is related to the continuous increase in electricity production. Why do people regard electricity as the main form of energy? For the production, distribution, and more convenient to use in the production[2].

The issue of electricity accounting is the most relevant in today's market relations. The main difficulty is that reliable estimation of power losses in distribution networks is almost impossible due to the technical and organizational problems in the electricity metering system. There are a number of urgent problems with the sufficiently high efficiency of transmission lines. These include:

- low reliability of electrical devices, excessive wear and deterioration of electrical systems, automation systems, protection, alarm systems;
- lack of timely, reliable and timely information on the operation of the power system; low efficiency of operated power grid operation during scheduled switching and emergency response;
- unacceptable power losses;
- power outages and lack of electricity due to an emergency.

The purpose of the automated system

The distribution of electricity generated by consumers with high voltage power lines is a classic example of complex technological processes that require methods, centralized control and control.

The concept of “reliability” is widely used everyday in all spheres of human activity (in science, technology, everyday life, art, medicine, etc.), which introduces the breadth of its interpretation. However, the practical solution of certain problems, and sometimes even clarification of their essence, is completely impossible without a clear establishment of certain concepts and relationships between them, the allocation of certain properties and their quantitative description. Therefore, it is advisable to begin the study of reliability by examining what is understood and the characteristics of reliability that are used in solving problems that arise during the creation and operation of artificial technical systems in general and electric power systems in particular[3].

Characteristics.

Works on the GSM 900/1800 network.

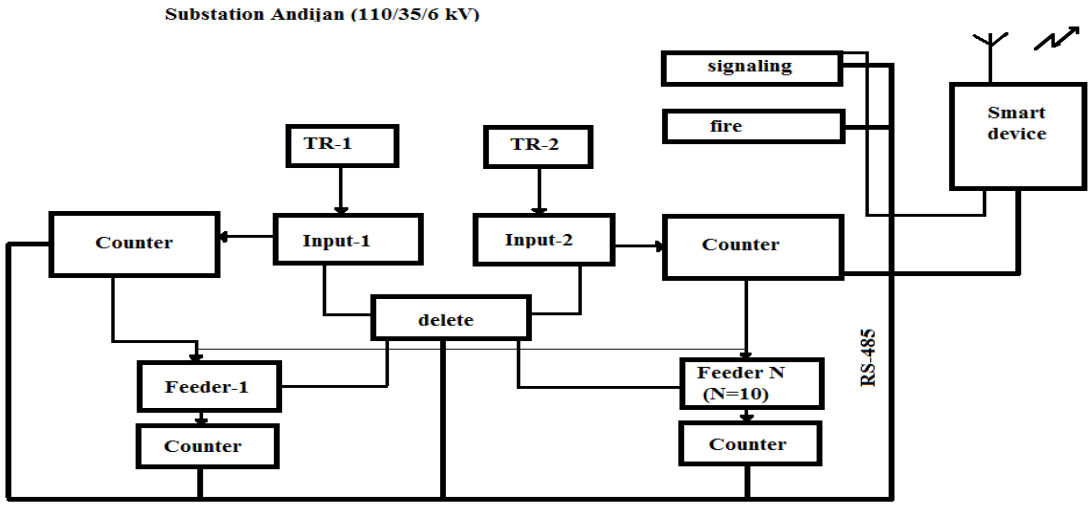
GPRS connection to the server through TCP / IP technology.

ADSL and Internet access.

Back up Server Availability.

Works with up to 15 different tires on one tire.

Fig,1.

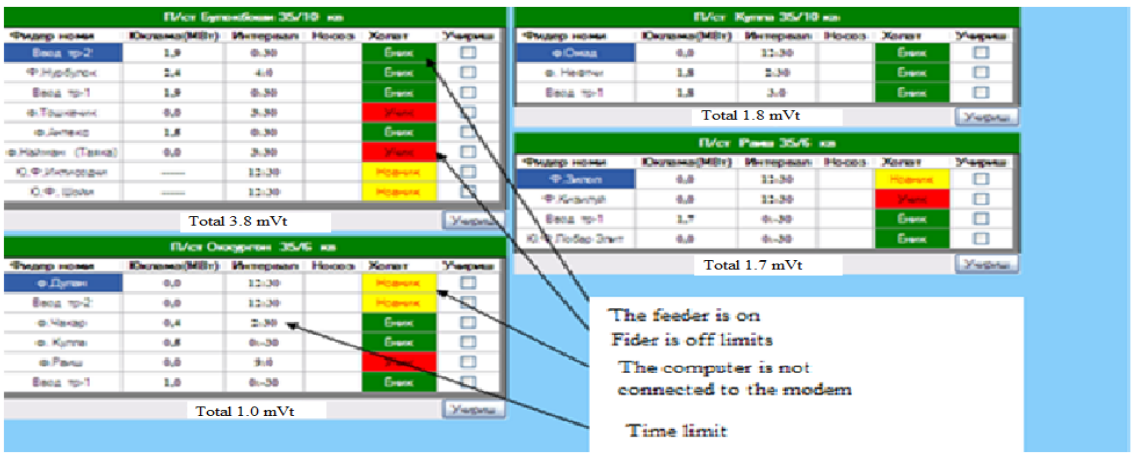


Database is available on the server and every 20 seconds the data from the smart device is recorded.

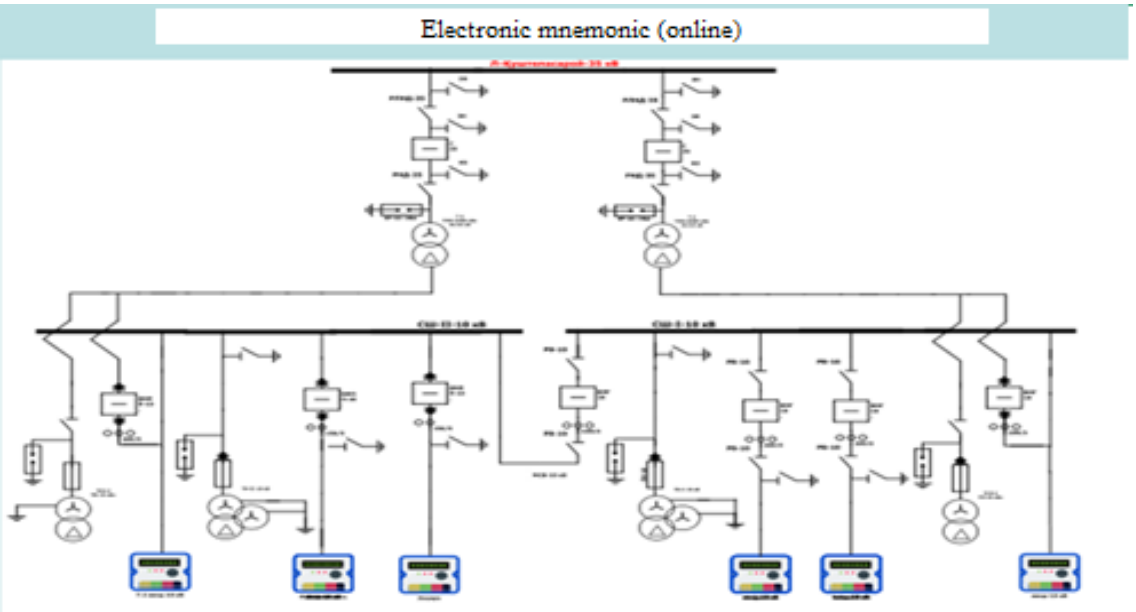
Data from the counter.

- Current (Phases A, B, C).
- Voltage (Phases A, B, C).
- Active power, kW (phases A, B, C).
- Reactive power, quark (Phases A, B, C).
- Full power, kVA (phases A, B, C).
- Frequency.
- Input / output active energy, kWT / hour (+ W / -W).
- Reactive energy input / output, kWh / h (+ Q / -Q).
- Angles between phases.
- Corners between current and voltage.

Fig, 2.



Fig, 3.



Filter numbers and allow other systems

• Intelligent device allows you to filter phone numbers, which allows the system to operate continuously, and can only be accessed through a memory number.

• Holley, Energomera, Mercury, Alpha, and other computer programmers have the ability to obtain information from the computer through an intelligent device.

• Alert, Security and Fire Safety.

• With the Radiomer Intelligent device it is possible to receive data from the substation from temperature, gas protection, object protection, fire safety (sensors) devices and send this information to the stored telephone numbers. If the load on the transformer overloads, the SMS will be sent in step 2 and after the set time the unselected feeders will be deleted.

- Stage 1: Chief Engineer on duty, district or city.
- Stage 2: The regional operational management officer.
- All data is recorded in the telemechanics database.

Table,1.

Фидер	Идентификатор	ТТ	ТН	Номер пломбы
Ф.Интеграл	434	20	100	1

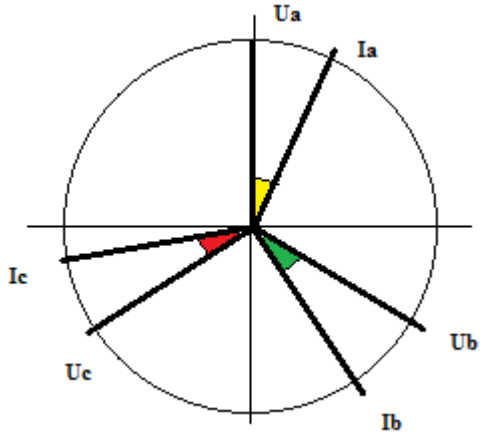
Table, 2.

Число	+W	Роз.	kVt	+Q	Роз.	kVar	-W	Роз.	kVt	-Q	Роз.	kVar
02/03/2016. 06.00.	1360.150	-	-	390.7760	-	-	0.0	-	-	366.3260	-	-
02/03/2016. 06.30.	1360.170	40.0391	-	390.7880	23.9868	-	0.0	0.0	-	366.3260	0.0	-
02/03/2016. 07.00.	1360.189	39.7949	79.8340	390.8030	30.0293	54.0161	0.0	0.0	0.0	366.3260	0.0	0.0
02/03/2016. 07.30.	1360.230	80.0781	119.8730	390.8270	47.9736	78.0029	0.0	0.0	0.0	366.3260	0.0	0.0
02/03/2016. 18.00.	1361.160	-	-	391.4200	-	-	0.0	-	-	366.3260	-	-
02/03/2016. 18.30.	1361.210	99.8535	-	391.4490	57.9834	-	0.0	0.0	-	366.3260	0.0	-
02/03/2016. 19.00.	1361.250	80.0781	179.9316	391.4680	37.9639	95.9473	0.0	0.0	0.0	366.3260	0.0	0.0
02/03/2016. 19.30.	1361.290	80.0781	160.1563	391.4930	50.0488	88.0127	0.0	0.0	0.0	366.3260	0.0	0.0
02/03/2016. 20.00.	1361.330	79.8340	159.9121	391.5170	47.9736	98.0225	0.0	0.0	0.0	366.3260	0.0	0.0
02/03/2016. 20.30.	1361.360	60.0586	139.8926	391.5350	36.0107	83.9844	0.0	0.0	0.0	366.3260	0.0	0.0
02/03/2016. 21.00.	1361.390	60.0586	120.1172	391.5530	36.0107	72.0215	0.0	0.0	0.0	366.3260	0.0	0.0
02/03/2016. 21.30.	1361.400	20.0195	80.0781	391.5590	11.9629	47.9736	0.0	0.0	0.0	366.3260	0.0	0.0
02/03/2016. 22.00.	1361.430	60.0586	80.0781	391.5780	38.0249	49.9878	0.0	0.0	0.0	366.3260	0.0	0.0
03/03/2016. 06.00.	1361.540	-	-	391.6540	-	-	0.0	-	-	366.3260	-	-
03/03/2016. 06.30.	1361.560	40.0391	-	391.6690	30.0293	-	0.0	0.0	-		0.0	-

03/03/2016. 07.00.	136 1.58 0	39. 79 49	79.83 40	391.6 800	21.97 27	52.00 20	0. 0	0. 0	0. 0		0. 0	0.0
03/03/2016. 07.30.	136 1.62 0	80. 07 81	119.8 730	391.7 030	46.02 05	67.99 32	0. 0	0. 0	0. 0		0. 0	0.0
03/03/2016. 08.00.	136 1.65 0	60. 05 86	140.1 367	391.7 270	47.97 36	93.99 41	0. 0	0. 0	0. 0		0. 0	0.0

Device type	DTS-546
Identifier	113376
Seal number	
Phase sequence	
Phase angle	
Current on	
Direction of phase currents	
Voltage limits	
Angle degrees (phases A and B)	120
Angle degrees (phases B and C)	120
Angle degrees (phases C and A)	120

TV	**100**	**TT**	**30**



	A	**B**	**C**	**Total**
Current A	0,057	0,059	0,059	
Voltages B	55,29	55,49,6	55,69,6	28800
Full power, kW				
Active power, kW	8.1	8.7	8.4	25800
Reaktive power kWar	4.2	4.2	4.2	12900
Angle degrees (A and B)	26.104	25.177	26.104	

	+W	**+Q**	**-W**	**-Q**	**Number**
Beginning of the month	1033.07	714.107	0.262	9.611	01/03/2016. 00.01.46
Beginning of the day	1034.37	714.723	0.262	9.629	03/03/2016. 00.02.05
The last	1034.64	214.843	0.262	9.63	03/03/2016. 12.06.55

Primary server and auxiliary server.

• Intelligent device connects to the host server as soon as it starts up. If the primary server fails, it will automatically connect to the backend server. In order to

improve and stabilize communication, the primary server and auxiliary servers must be connected to different Internet providers.

• The IP addresses of the servers must be static. 213.230.91.140 (RadioMer.uz)

• VEB Server and its convenience.

• The fastest and easiest way to get information right now is the web sites. Another good advantage of Web servers is that users can access information in any way they want, from their phones, tablets, and similar devices.

An automated monitoring system of electrical networks is designed to perform the following tasks and functions:

• Substation scheme.
• Structure of the system.
• Characteristics of the intelligent device.
• Counters.
• Information from counters.
• Memory.
• Filter numbers and allow other systems.
• System password.
• Types of web site access permissions.
• Alert, guard and fire safety.
• Circuit system.
• Additional discrete inputs / outputs.
• Technical characteristics of the station.
• Troubleshooting
• Primary server and auxiliary server.
• VEB Server and its convenience.
• Substance balance.
• Real-time telemetry balance.
• Consumers' Personal Cabinet
• Methods for summarizing the flow of electricity.
• RadioMer_ODS client software and its convenience.
• Electronic mnemoshema.
• Group substation (110 kV line).
• Feeder constraint statistics at the station.
• RadioMer devices.
• Failures.
• Economic analysis.

- centralized management and control of complex geographically distributed networks, but integrated networking processes;

- Efficient power management of the power supply network, where the necessary information should come from the power supply control point;

- processing and presenting information on the current state of managed facilities in a user-friendly way;

- collection of management and command data in the current managed technological process, which means a minimal delay in data transfer and management activities;

Ensure the highest reliability of information delivery and its reliability, as the damage caused by incorrect commands or other instant messages and the transmission of these messages can cause significant economic losses and, in some cases, emergencies. The automated system must meet the following operating requirements:

- High level of interference should be ensured for the reliability and reliability of the data transmission;

- Provide reliable information to the power points control center and provide this information to the engineer and dispatcher so that they can quickly and accurately respond to power failure;

- maintaining a complete record of the data collected and automatically storing the event log;

- It has the function of automatic self-diagnostics of devices and self-control of the unit, which maintains operation of individual boards and blocks;

- The automated system should also allow for relatively simple reconstruction during the expansion (duplication) of information and ensure compatibility with existing communication channel systems and equipment;

- The automated system must operate in a variety of environmental conditions: high humidity, heat, cold, fog, ice.

Summary:

All of the above problems are relevant and are widely discussed in our country and abroad. The reliability of electrical equipment can be solved by replacing worn-out equipment with new ones, but this is due to the need for significant investment. At the same time, the introduction of an automated information system for real-time monitoring of electrical networks can be an effective solution to these problems.

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RISK AND CONTROL SELF ASSESSMENT (RCSA) IN UZBEK BANKS: CHALLENGES AND OPPORTUNITIES

Abstract: *This article explores the adoption of RCSA practices within the Uzbek banking sector, shedding light on the distinct challenges and emerging opportunities in this dynamic market. Also, the paper describes key challenges such as insufficient technological infrastructure, limited expertise in risk management methodologies, and the complexities of adapting to evolving regulatory frameworks. Conversely, opportunities lie in adopting advanced technological solutions, harmonizing practices with international standards, and incorporating innovative approaches. The study underscores the importance of RCSA in fostering a culture of accountability, this approach helps make banking operations more efficient. The research offers practical recommendations for integrating RCSA into banking operations. These suggestions aim to strengthen risk management practices to guide financial institutions in advancing risk resilience and supporting the sustainable development of Uzbekistan's banking sector.*

Keywords: *Risk and Control Self-Assessment (RCSA), Risk Management Practices, Operational risk management systems, Regulatory Compliance, Financial Sustainability*

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O'ZBEKISTON BANKLARIDA XAVF VA NAZORAT O'ZI-O'ZI BAHOLASH (RCSA): QIYINCHIQLAR VA IMKONIYATLAR

Annotatsiya: *Mazkur maqolada O'zbekiston bank sektorida RCSA (xatarlarni nazorat qilish va o'z-o'zini baholash) amaliyotini joriy etish masalasi o'rganilgan bo'lib, ushbu sohadagi muayyan muammolar va yuzaga kelayotgan imkoniyatlar yoritilgan. Shuningdek, maqolada mavjud muammolar - yetarli texnologik infratuzilmaning yo'qligi, xatarlarni boshqarish metodologiyalarida yetarli tajribaning mavjud emasligi va o'zgarib borayotgan normativ-huquqiy talablar bilan moslashishning murakkabligi - haqida so'z boradi. Aksincha, zamonaviy texnologik yechimlarni joriy etish, xalqaro standartlar bilan uyg'unlashuv va innovatsion yondashuvlarni integratsiya qilish sohadagi muhim imkoniyatlar sirasiga kiradi. Tadqiqotda RCSA tizimining hisobdorlik madaniyatini shakllantirishdagi roli ta'kidlanadi, bu esa bank faoliyatini samaraliroq qiladi. Shuningdek, maqolada RCSA amaliyotini bank ish faoliyatiga integratsiyalashga oid amaliy tavsiyalar berilgan. Ushbu tavsiyalar moliyaviy institutlarga xatarlar*

barqarorligini mustahkamlash va O‘zbekiston bank sektorining barqaror rivojlanishiga hissa qo‘shishda yo‘l-yo‘riq beradi.

Kalit so‘zlar: *Risklarni nazorat qilish va o‘z-o‘zini baholash (RCSA), xatarlarni boshqarish amaliyotlari, operatsion xatarlarni boshqarish tizimlari, normativ-huquqiy talablarga muvofiqlik, moliyaviy barqarorlik.*

I. Introduction

□ background on the uzbek banking sector

Uzbekistan's banking sector is a cornerstone of the country's financial system, playing a pivotal role in fostering economic growth and supporting key industries. As of 2024, the sector comprises 36 banks, including 9 state-owned, and 27 private, and foreign-owned banks. The state has historically dominated banking activities, particularly through large state-owned banks that primarily focus on financing public sector projects and industries. However, recent reforms initiated under the national development strategy 2030 have sought to privatize these institutions, reduce state involvement, and enhance competition. These changes aim to modernize the sector, promote private sector participation, and align financial practices with international standards.

Despite these advancements, the sector faces challenges such as high levels of non-performing loans (npls), limited financial inclusion, and outdated risk management practices. These challenges make it essential for banks to develop practical internal frameworks that can effectively manage operational, credit, and market risks.

Although business processes are exposed to numerous risks, it is essential that they remain accurate and consistent. The risk and control self-assessment (rcsa) is a valuable tool for evaluating these processes and identifying potential weaknesses. Based on the results of the rcsa, banks can effectively formulate action plans to enhance and strengthen their operational procedures.

□ what is a risk and control self-assessment (rcsa)?

In simple terms, a risk and control self-assessment (rcsa) is a process that helps organizations look closely at their operations, spot potential risks, and check whether their existing controls are working effectively. It is considered one of the most practical tools in risk management because it encourages teams to take ownership of risks before problems escalate.

The idea behind rcsa gained momentum in the early 90s of 20th century, particularly after the committee of sponsoring organizations of the treadway commission published important standards on internal controls. Over time, these practices evolved into a recognized method for ensuring compliance with laws such as the foreign corrupt practices act (fcpa) and for strengthening internal governance across industries.

Financial institutions commonly use rcsa to fulfill regulatory obligations, such as conducting an annual self-assessment of operational risks across the organization. Beyond the financial sector, it is also a useful method for assessing risks associated with third-party vendors.

A significant shift in modern risk management has been the move from a centralized, top-down model to a more integrated, employee-driven approach. As deddy jacobus (2015) explains[61], this "new paradigm" places risk and control self-assessment (rcsa) at the heart of effective enterprise risk management. Instead of relying solely on management to identify and mitigate risks, organizations are encouraged to involve employees across all departments. This participative method not only helps uncover operational risks more accurately but also builds a stronger sense of ownership among staff. By using workshops and structured discussions, rcsa fosters better communication, improves understanding of internal controls, and supports continuous improvements in organizational processes.

□ **importance of risk control and self-assessment in banking**

Today, rcsa plays a crucial role in how banks manage risks. This approach helps financial institutions spot risks early and take action before they escalate. An effective rcsa framework not only verifies the presence of internal controls but also evaluates whether those controls genuinely mitigate the intended risks and align with the bank's strategic objectives.

Several important aspects illustrate why rcsa has become such an essential part of modern banking risk management:

Rcsa allows organizations to identify potential risks before they materialize into significant issues. By empowering employees to assess risks and controls in their areas of responsibility, institutions can address vulnerabilities promptly and implement preventative measures.

Rcsa fosters a culture of accountability by involving staff at all levels in the risk management process. When employees take ownership of risk identification and mitigation, it strengthens organizational commitment to maintaining operational integrity.

In an increasingly regulated financial environment, rcsa helps institutions meet compliance requirements by providing a systematic framework for documenting risks, controls, and mitigation efforts. This ensures readiness for regulatory audits and reduces the risk of penalties for non-compliance.

By providing a clear understanding of risks and the effectiveness of controls, rcsa supports data-driven decision-making. Management can prioritize resource allocation, develop contingency plans, and align risk strategies with the institution's overall goals.

Rcsa identifies inefficiencies in processes and controls, enabling organizations to streamline operations and reduce costs. This continuous improvement approach ensures that risk management practices remain agile and effective in a dynamic business environment.

Examples of major operational risk losses

Throughout recent decades, several high-profile cases have demonstrated how serious operational risks can be for financial institutions:

[61] Jacobus, D. (2015). New paradigm of managing risks: Risk and control self-assessment. *Agriculture and Agricultural Science Procedia, 3*, 32–34. https://doi.org/10.1016/j.aaspro.2015.01.008

a) Republic new york corporation faced a loss of around $611 million as a result of external fraud, one of the largest cases of its kind at the time.

b) Wells fargo incurred losses totaling $150 million due to failures in transaction processing systems, highlighting the risks associated with technology-driven banking services.

c) Providian financial corporation suffered losses estimated at $405 million, stemming from improper billing practices and internal process weaknesses.

d) Bnp paribas was fined approximately $9 billion in 2014 for violating economic sanctions, underlining the importance of compliance and regulatory risk management.

These examples show that operational risks can result not only in substantial financial losses but also in long-lasting reputational damage. They serve as important lessons for all banks aiming to strengthen their internal control environments.

The financial sector is exposed to a constantly evolving risk landscape, including technological disruptions, cybersecurity threats, and market volatility. Rcsa equips institutions with the tools to identify and adapt to emerging risks, ensuring resilience and sustainability.

I. Literature review

Risk and control self-assessment (rcsa) has developed over time as a practical tool for managing operational risks in banks. It became more important as financial institutions started looking for ways to better understand and control risks internally, beyond just relying on external audits. This shift reflects a broader move toward giving more responsibility to banks themselves when it comes to managing risks. This approach was further supported by the basel ii and iii regulations, which encouraged banks to use their own systems to assess and manage operational risks (basel committee on banking supervision, 2006)[62].

Research has shown that rcsa can help reduce losses and make risk management more transparent. Cruz (2002), for example, highlights that while numbers and data are important, some risks are not captured in past records[63]. Rcsa is especially useful in detecting latent risks that traditional metrics or historical data often overlook. Mikes (2009) adds that banks make risk assessments part of their daily decisions tend to build a stronger sense of responsibility and awareness among employees[64].

The use of web-based rcsa applications has also gained prominence, particularly in the context of operational risk management. Yulianto (2019) demonstrates that integrating rcsa into a web-based system facilitates real-time data capture and analysis, which supports continuous risk monitoring and decision-

[62] Basel Committee on Banking Supervision. (2006). International Convergence of Capital Measurement and Capital Standards: A Revised Framework - Comprehensive Version. Bank for International Settlements. https://www.bis.org/publ/bcbs128.htm

63 Cruz, M. G. (2002). Modeling, measuring, and hedging operational risk. Wiley.

64 Mikes, A. (2009). *Risk management and calculative cultures.* Management Accounting Research, 20(1), 18–40. https://doi.org/10.1016/j.mar.2008.10.005

making. By implementing such technologies, banks can reduce manual errors and promote a more agile risk management process.[65]

Moreover, in recent years, banks have increasingly adopted technology to enhance their risk and control self-assessment (rcsa) processes. Kpmg (2023) explains how integrating artificial intelligence (ai) and natural language processing (nlp) can streamline control libraries and automate the identification of redundant controls, thereby improving efficiency.[66]

Iii. Methodology

This article is based on a review of available studies, international regulations, and practical examples from operational risk management. No special surveys, interviews, or numerical research were conducted.

The main goal of this research is to understand how risk and control self-assessment (rcsa) systems, commonly used by large banks in developed countries, can be introduced and adapted to uzbek banks. To achieve this, the paper examines global standards, such as those from the basel committee, and advice from the international monetary fund, and compares them with the current situation in uzbekistan.

We began by reviewing articles, reports, and banking guidelines to understand the common practices for implementing rcsa. It also involved examining how uzbek banks are currently organized, the difficulties they face, and areas where improvements could be made. The focus was particularly on operational risks and internal control systems.

While the paper does not draw on primary data or case studies, it offers a structured foundation that banks can build upon when designing or refining their risk control strategies. It also identifies areas where future research could build upon deeper studies based on real cases.

Iv. Discussion

Risk and control self-assessment (rcsa) is a critical tool in the operational risk management framework of banks, offering a structured approach to identify, assess, and mitigate risks within banking processes. The introduction of rcsa in uzbek banks (hereinafter the banks) presents both challenges and opportunities as these institutions strive to align with international best practices while navigating local operational and regulatory landscapes. The following analysis synthesizes findings from the document and applies them to the specific context of uzbekistan.

Many banks struggle to identify operational risks accurately and to apply rcsa methods effectively. Many employees lack adequate training on how to identify and classify risks, as highlighted in the document's emphasis on training needs to ensure effective risk management.

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[65] Yulianto, E. (2019). Implementation of Risk Control Self Assessments Using Rapid Application Development Model in Bank Operational Risk Management Process. Journal of Theoretical and Applied Information Technology, 97(11), 2965–2968. Retrieved from https://www.jatit.org/volumes/Vol97No11/7Vol97No11.pdf

66 KPMG. (2023). *Risk and Control Self-Assessment: What's Next?* Retrieved from https://assets.kpmg.com/content/dam/kpmg/es/pdf/2024/01/risk-control-self-assessment.pdf

Effective rcsa requires robust systems for capturing and analyzing loss data. The banks frequently encounter technological limitations, including outdated hardware and software, which impede automated data collection and processing. Manual processes, which remain prevalent, increase the likelihood of errors and inefficiencies.

The banks operate within a dynamic regulatory environment. Frequent updates in banking laws and compliance requirements necessitate agility in rcsa practices. The document highlights compliance risks as a serious component of operational risk, underscoring the need for banks to adapt their rcsa frameworks to regulatory changes.

The banks can benefit from adopting standardized rcsa templates and methodologies as outlined in the document. These practices include incorporating basel-compliant frameworks and risk matrices to align local processes with global standards.

The role of training in fostering a culture of risk awareness is very necessary. By conducting regular workshops and interactive rcsa sessions, the banks can empower employees to effectively identify and manage operational risks.

Transitioning to automated rcsa systems offers the banks an opportunity to enhance efficiency and accuracy. Implementing technologies such as data analytics and machine learning can streamline risk identification, assessment, and reporting processes.

Establishing networks for sharing external loss data, as suggested in the document, could significantly benefit the local banks. Platforms like the operational risk exchange (orx) provide valuable insights into emerging risks and successful mitigation strategies employed by peer institutions.

Collaboration between banks and the regulator in uzbekistan can create a conducive environment for implementing rcsa. Clear guidelines and incentives for adopting robust risk management practices will encourage compliance and innovation in operational risk management.

□ **vulnerability assessment**

Final Risk Rating:	
Risk Assessment Rating	The final rating of the risk arrived at by multiplying the Risk impact score and Vulnerability score
Risk Index	Risk rating expressed in percentage terms depending upon the risk score
Health Index	Risk index deducted from above

Risk Rating

The risk rating process is carried out based on a score derived from assessing both Impact and Vulnerability, taking into account the existing risk and internal control framework within the bank. It is crucial to understand that although the speed at which a risk materializes can influence the bank's perceived vulnerability

and aid in formulating an appropriate mitigation strategy, it does not directly affect the risk rating itself.

The main factors considered when determining the risk rating are as follows:

Impact / Severity Rating: The proposed impact scale evaluates both financial and non-financial consequences of operational risk events to ensure a comprehensive risk mitigation approach. The RCSA register automatically assigns ratings for both financial and non-financial impacts. The risk rating is determined by selecting the highest score from the financial and non-financial ratings attributed to each risk.

Frequency / Vulnerability Rating: Vulnerability reflects the likelihood of a risk occurring, given the effectiveness of the existing control environment. RCSA participants assign vulnerability scores to risks based on a subjective evaluation of the current control measures and the probability of the risk occurring.

Risk Rating (Incorporating Impact and Vulnerability): The proposed risk rating matrix uses standardized scores derived from the combined assessment of impact and vulnerability for both Business and Support units. The risk levels are categorized into four distinct scales: critical, high, medium, and low.

Risk Index

Risk index of individual risk:

The individual risk statements in an RCSA register are allotted a risk index which isuseful in monitoring the changes in the risk and its control environment. The risk index is derived by dividing the risk score with the product of a maximum score of impact (say10 scales are set) and a maximum score of frequency/ vulnerability (say 4 scales are set) i.e., 40 and multiplying by 100

#	Item	Formula
1	Risk score	$Risk\ score = Risk\ Impact\ Score * Risk\ Vulnerabilty\ score$
2	Risk Index	$Risk\ Index = \frac{Risk\ Score}{40} \times 100$

Risk index of RCSA entity:

The overall rating of the RCSA entity will be done based on the risk assessment of each risk. The final rating must be available for validation with internal audit scores/results.

The methodology that can be adopted for the rating of the RCSA entity is given below

$$Risk\ index\ of\ the\ RCSA\ entity = (\sum Impact * vulnerability\ for\ individual\ risk) /\{.of\ risks\ events\ *\ Maximum\ score\ for\ impact * Maximum\ score\ for\ vulnerability\}$$

E.g.: if an RCSA entity has 5 risks and each has been rated on impact and vulnerability as given below

Risk Events	Impact	Vulnerability	Severity = Impact * vulnerability
Risk 1	2	4	8
Risk 2	3	2	6
Risk 3	6	1	6
Risk 4	5	2	10
Risk 5	1	3	3
Total Score			**33**

In this case:

∑ Impact × vulnerability for individual risk = 33

No. Ofrisks events = 5

Maximum score for impact = 10

Maximum score for vulnerability = 4

Risk index of the RCSA entity=33/5×10×4=33/200=16.50%

Evaluation of Health Index

The bank assesses Health Index for capturing the Operational Risk profile of theBank.

Like the calculation of Risk Index,

A) Health index of individual risk: 1 - Risk index of individual risk

B) Health index of RCSA entity = 1 - Risk Index of RCSA entity

As per the previous example, Health index of RCSA entity = 1 - 16.5% = 83.5%

V. PROPOSED ROADMAP FOR IMPLEMENTING RCSA IN UZBEK BANKS

Implementing a Risk and Control Self-Assessment (RCSA) framework in a developing financial environment such as Uzbekistan requires a phased and realistic approach. Based on best practices from international institutions and tailored to local conditions, the following roadmap outlines the key steps that banks can follow to gradually establish effective RCSA processes.

Step 1: Define Objectives and Scope

Begin by clearly identifying the objectives of the RCSA. This includes aligning with the bank's overall risk management strategy and determining which departments or processes will be assessed. Initially, it may be practical to focus on high-risk areas or business units that are most exposed to operational risk.

Step 2: Identify and Categorize Key Risks

Departments, in collaboration with the risk management unit, should identify risks specific to their functions. These can include process failures, IT breakdowns, fraud, or human errors. Risks should be classified using a consistent taxonomy to allow comparison and reporting across the bank.

Step 3: Evaluate Existing Controls

For each identified risk, current internal controls should be listed and evaluated. Are the controls working as intended? Are they documented and tested? This step helps to highlight gaps or weaknesses in risk mitigation.

Step 4: Assign Risk Ratings (Impact and Likelihood)

Using a standardized matrix, each risk is rated based on its potential impact (financial and reputational) and its likelihood of occurring. This produces a risk severity score, which helps prioritize areas that need immediate attention.

Step 5: Develop Action Plans for Improvement

For risks rated as high or critical, action plans should be developed. These may involve strengthening controls, revising processes, or providing staff training. Each plan should have a timeline and a responsible person or team.

Action plan – per each priority risk						
#	Action title	Due date	Responsible person	Action details	Impact details	Priority

RCSA findings and conclusions shall be summarized in the management report which includes overview of scope and activities, main risks and controls, priorities and proposals for management actions. Summary report shall be submitted to the senior management with appended RCSA mapping report, profile report, questionnaire, heat map, and action plan, and presented by responsible working team. With management decision business line manager shall start execution of action plan, and risk management shall perform control function over implementation of management decisions.

Step 6: Monitor, Document, and Report

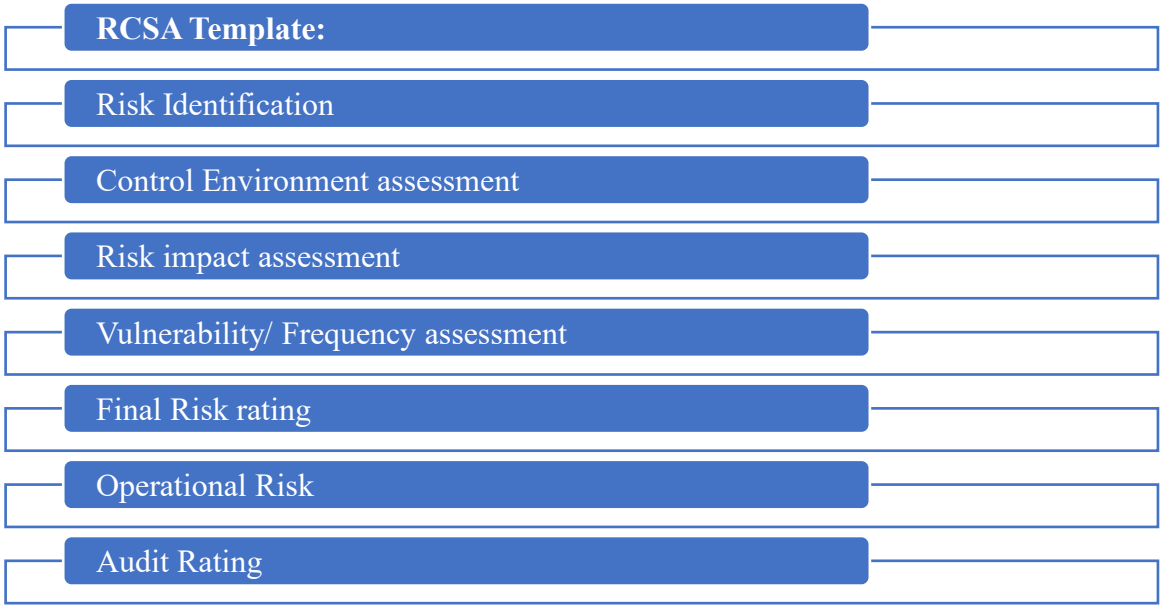
An internal database or register should be used to record all risk assessments, controls, and action plans. Regular reporting ensures transparency and helps both management and auditors understand how operational risk is being managed.

Step 7: Review and Update Regularly

RCSA should not be a one-time activity. Banks should set a schedule - annually or semi-annually - to revisit risk assessments, update scores, and reflect

any changes in operations, regulation, or technology. Feedback from audits or incidents should be used to improve the next RCSA cycle.

Moreover, the RCSA register is broadly grouped into sections. Each of these sections can further have sub-headers for carrying out the self-assessment as under:



To streamline the RCSA implementation, a standardized template can be adopted. This template helps banks systematically document risks, control measures, assessment outcomes, and improvement actions.

CONCLUSION

This article has highlighted the importance of introducing and strengthening RCSA frameworks in Uzbekistan's banking sector. While many international banks already use RCSA as a routine part of their operational risk strategy, its application in Uzbekistan is still at an early stage. Limited technical infrastructure, lack of standardized methods, and regulatory uncertainty remain key barriers.

However, there is also clear potential. As banking reforms continue and digital solutions are introduced, there is an opportunity to build more effective risk assessment systems. By starting with simple but structured self-assessment tools, and gradually expanding them, banks can improve their understanding and control of internal risks.

The proposed roadmap outlines a practical way forward, from defining risk areas and evaluating controls to monitoring outcomes and updating assessments regularly. Although this study is conceptual in nature, it lays the groundwork for future field-based research and pilot implementations. To strengthen risk management, Uzbek banks should train staff, build a risk-aware culture, and work closely with regulators to embed self-assessment into their practices.

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CLINICAL STUDY OF THE EFFECTIVENESS OF METHODS FOR DIAGNOSIS, TREATMENT, AND PREVENTION OF VAGINAL MICROBIOCENOSIS DISORDERS IN WOMEN

Abstract: *Vaginal microbiocenosis plays a crucial role in maintaining women's reproductive health. Disruption of the normal microbial flora leads to a wide range of gynecological diseases, including bacterial vaginosis, candidiasis, and nonspecific vaginitis. This review aims to summarize current approaches to the diagnosis, treatment, and prevention of vaginal microbiota disorders. The paper considers modern molecular genetic diagnostic methods, evaluates the efficacy of various therapeutic regimens including probiotics, and highlights strategies for microbiota restoration. The significance of personalized therapy and the role of recurrent infections are also discus*

Keywords: *vaginal microbiota, bacterial vaginosis, probiotics, diagnosis, dysbiosis, treatment, prevention*

Introduction. The human vaginal microbiota is a dynamic ecosystem predominantly composed of lactobacilli species that ensure a protective acidic environment, preventing colonization by pathogenic microorganisms. Disturbance in this balance, termed vaginal dysbiosis or microbiocenosis disorder, is linked with gynecological inflammation, pregnancy complications, and an increased risk of sexually transmitted infections (STIs) [1,2].

Recent clinical interest has grown around identifying reliable diagnostic markers, optimizing therapeutic protocols, and preventing recurrent disturbances. The complexity of vaginal flora and individual variability necessitate a multifactorial approach combining molecular diagnostics and personalized treatment strategies [3].

Diagnostic Approaches. Traditional diagnostic tools for vaginal microbiocenosis disorders include Amsel criteria and Nugent scoring, which evaluate the presence of clue cells, pH levels, and microbial composition under microscopy. However, these methods often lack sensitivity and specificity [4].

Modern diagnostics have shifted towards molecular methods such as polymerase chain reaction (PCR) and next-generation sequencing (NGS), which allow for precise detection of microbial species and their abundance. These techniques enable the identification of bacterial community state types (CSTs) and provide better insight into the microbial shifts associated with pathology [5,6].

Treatment Strategies. Standard treatment for bacterial vaginosis (BV) includes antibiotics such as metronidazole and clindamycin. However, high

recurrence rates and adverse effects have prompted exploration into alternative or adjunctive therapies [3,8].

Probiotics, particularly strains of Lactobacillus crispatus, L. rhamnosus, and L. reuteri, have shown promise in restoring the vaginal microbiota following antibiotic therapy. Clinical studies suggest that oral and intravaginal administration of probiotics can enhance recolonization and reduce recurrence [7,9].

Combined regimens incorporating antiseptics, biofilm-disrupting agents, and hormonal regulation are increasingly applied in recurrent cases. Attention is also given to host immune status, sexual practices, and hygiene in therapeutic planning [2,4].

Prevention and recurrence. Preventive strategies include promoting healthy vaginal hygiene, reducing unnecessary antibiotic use, and maintaining estrogen levels, especially during perimenopause. The use of vaginal suppositories containing lactic acid and prebiotics may also aid in maintaining microbial balance.

Recurrent dysbiosis is a significant clinical challenge. Studies have found that persistence of Gardnerella vaginalis biofilms contributes to frequent relapse. Thus, long-term management strategies are essential, including behavioral counseling, follow-up microbiota assessments, and individualized maintenance therapy [1,5,10].

Conclusion. Effective management of vaginal microbiocenosis disorders requires an integrative approach that combines modern diagnostics with evidence-based therapeutics and prevention. While significant progress has been made, particularly in molecular diagnostics and probiotic therapy, further research is needed to develop targeted, sustainable, and personalized interventions.

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ANALYSIS OF THE RELATIONSHIP BETWEEN VAGINAL MICROBIOOCENOSIS COMPOSITION AND VARIOUS DISEASES OF THE FEMALE REPRODUCTIVE SYSTEM

Abstract. *The human vaginal microbiota plays a central role in maintaining the health of the female reproductive system. Imbalances in vaginal microbiocenosis have been increasingly associated with gynecological and obstetric disorders, including bacterial vaginosis, candidiasis, pelvic inflammatory disease, endometriosis, and infertility. This review analyzes current scientific evidence on the relationship between alterations in the vaginal microbiota and reproductive system pathologies. Understanding these associations is key for developing targeted diagnostics and preventive strategies.*

Keywords: *Vaginal microbiota, reproductive health, dysbiosis, endometriosis, infertility, pelvic inflammation, bacterial vaginosis*

Introduction. The vaginal microbiota, predominantly composed of Lactobacillus species, is a crucial factor in female reproductive system stability. These bacteria maintain an acidic pH environment, produce antimicrobial substances, and prevent pathogen colonization. Dysbiosis, or disruption in this ecosystem, has been linked to various gynecological diseases and adverse reproductive outcomes [1,2].

Understanding how specific microbial shifts contribute to or result from reproductive system disorders is essential for modern gynecology and reproductive medicine. This article reviews key findings on the correlation between microbiocenosis composition and common reproductive pathologies.

Vaginal dysbiosis and common gynecological conditions

1. Bacterial vaginosis (BV)

BV is characterized by a significant decrease in Lactobacillus spp. And an overgrowth of anaerobic bacteria such as Gardnerella vaginalis, Atopobium vaginae, and Mobiluncus spp. This dysbiotic state disrupts immune homeostasis and increases vulnerability to STIs, including HIV [3].

2. Vulvovaginal Candidiasis

Although Candida species are part of the normal flora in some women, overgrowth due to microbiota imbalance—especially after antibiotic use—can lead to symptomatic infection. An inverse correlation between Lactobacillus density and Candida virulence has been observed [4].

3. Pelvic Inflammatory Disease (PID)

Studies have demonstrated that women with a dysbiotic vaginal profile are more prone to ascending infections leading to PID. The presence of BV-associated bacteria is a known risk factor for uterine and fallopian tube inflammation [5].

Reproductive Disorders and Microbial Shifts

1. Endometriosis.

Recent studies indicate that women with endometriosis exhibit altered vaginal and endometrial microbiota, with increased prevalence of Gardnerella and Streptococcus species, and reduced Lactobacilli. This suggests a possible role of microbiota in the pathogenesis or progression of the disease [6].

2. Infertility

A balanced vaginal microbiome is associated with improved sperm viability and embryo implantation. Dysbiosis, particularly low levels of L. Crispatus, correlates with reduced IVF success rates and higher miscarriage risk [1,6].

3. Pregnancy Complications

Microbiota composition affects risks of preterm birth, miscarriage, and preeclampsia. BV and vaginal inflammation are particularly significant in early pregnancy loss, often mediated by microbial metabolites and local immune disruption [3].

Diagnostic and therapeutic implications. Assessment of vaginal microbiota via modern techniques such as 16S rRNA sequencing enables early detection of dysbiotic profiles. Interventions like probiotic therapy, prebiotics, and microbiota transplantation are emerging as adjuncts to classical treatment protocols [2,7].

Personalized medicine, focusing on microbiota profiling, may allow individualized risk assessment and management strategies for women at risk of reproductive dysfunctions.

Conclusion. The composition of vaginal microbiocenosis is closely linked to the health of the female reproductive system. Dysbiosis is not merely a marker but often a contributing factor to the onset and progression of several reproductive disorders. Future research should focus on microbiota-targeted therapies and integrating microbial profiling into routine gynecological care.

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GAPS IN CURRENT RESEARCH AND THE NEED FOR FURTHER STUDIES ON PATHOLOGICAL VAGINAL MICROBIOME IN WOMEN OF DIFFERENT AGE GROUPS

Abstract. *The human vaginal microbiome plays a pivotal role in maintaining reproductive and general health across a woman's lifespan. However, current research predominantly focuses on women of reproductive age, leaving significant knowledge gaps in other age groups. This review highlights the limitations of existing studies and underscores the need for further research into the pathological alterations of the vaginal microbiota in adolescent, perimenopausal, and postmenopausal women. Understanding age-specific patterns of microbial imbalance is essential for developing tailored diagnostic and therapeutic strategies.*

Keywords: *vaginal microbiome, dysbiosis, aging, women's health, adolescent, menopause, microbiota research gaps*

Introduction. The vaginal microbiome is a complex and dynamic ecosystem that undergoes significant shifts throughout a woman's life due to hormonal, immunological, and lifestyle-related changes. While Lactobacillus spp. dominate the vaginal flora of healthy women of reproductive age, other microbial compositions are more prevalent during childhood and after menopause [1,2]. Despite growing interest in the human microbiome, there remains a striking imbalance in the representation of different age groups in vaginal microbiota studies.

The purpose of this review is to outline the main research gaps and advocate for expanded studies on the pathological microbiome across all stages of a woman's life.

1. The understudied vaginal microbiota in adolescents

Adolescence marks the initial formation of stable vaginal microbiota after puberty. However, studies focusing on this age group are limited. Early-life microbiome disturbances may have long-term implications, including increased susceptibility to infections and reproductive disorders [3]. Moreover, adolescent girls often receive antibiotics or hormonal contraceptives, both of which may alter microbial balance. Yet, the longitudinal impact of such interventions on the maturing vaginal microbiome remains poorly understood. A lack of normative data also hinders the diagnosis of pathological states in this population.

2. Insufficient Research in Perimenopausal and Postmenopausal Women

Menopause is associated with estrogen withdrawal, which significantly affects the vaginal environment—pH increases, Lactobacillus colonization declines,

and anaerobic organisms may proliferate. These changes are linked to conditions such as atrophic vaginitis, urinary tract infections, and increased risk of STIs [4].

However, most studies exclude women over 50, creating a critical gap in knowledge. More data is needed on how the pathological microbiota develops in menopausal women, particularly in the context of hormone replacement therapy and chronic comorbidities such as diabetes and cardiovascular disease [5].

3. Age-Specific Dysbiosis and Disease Associations

There is increasing evidence that dysbiosis manifests differently depending on age. For example, BV in adolescents often presents without the classic symptoms found in older women, leading to underdiagnosis [3]. Similarly, postmenopausal dysbiosis may contribute to genitourinary syndrome and decrease quality of life, but is rarely addressed in clinical practice. Research must go beyond reproductive outcomes to investigate how vaginal microbial alterations impact overall health and systemic inflammation across age groups [6].

4. Methodological limitations and the need for standardization

Another major obstacle is the lack of standardized methodology in microbiome studies. Variations in sample collection, sequencing technology, and data interpretation hinder comparison across studies. Furthermore, the definition of a "healthy" microbiome remains age-dependent and elusive [2,7]. Establishing standardized protocols and longitudinal cohort studies are critical steps toward better understanding the pathological microbiota in different life stages.

Conclusion. Despite the recognized importance of the vaginal microbiome in women's health, there are significant research gaps concerning adolescent and postmenopausal populations. Age-specific studies are essential to uncover the full spectrum of microbial dysbiosis and its implications. Future research must address these deficiencies through inclusive cohort designs, improved methodologies, and interdisciplinary approaches. Only with comprehensive, age-sensitive data can truly effective diagnostics and treatments for vaginal dysbiosis be developed for all women.

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TAJRIBADA KO`KRAK LIMFA YO`LI BOG`LANGANDA JIGARDA MORFOLOGIK O'ZGARISHLAR

Annotatsiya*: Maqolaning ma`zmunida yozilishich, tajriba sharoitida itlarning ko`krak limfa yo`li bo`yin sohasida venaga quyilish joyidan bog`langanda jigarning to`qimalarida limfa tizimining patomorfologik o`zgarishi o'rganilgan. Ko'krak limfa va o't yo'llarini birgalikda bog'lashdan keyin jigarda limfa aylanishining buzilishi ta'sirini o'rganishda kanallarni bog'lashdan keyin Disse bo'shliqlarini aniqlashda qo'shimcha morfologik tavsiflar keltirilgan.*

Kalit so'zlar: *tajribada, it, limfa tomirlari, jigar, patomorfologik o'zgarish, ko'krak limfa yo'li. гематоксилин-эозином, пикрофуксином по Ван-Гизону.*

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EXPERIMENTAL MORPHOLOGICAL CHANGES IN THE LIVER IN THE LOCALIZATION OF THE THORACIC LYMPHATIC PATHWAY

Abstract: *The article describes pathomorphological changes in the lymphatic system in liver tissues of dogs under experimental conditions with ligation of the thoracic lymphatic duct at the site of its entry into the vein on the neck. Additional morphological characteristics are given in the study of the effect of impaired lymph circulation in the liver after combined ligation of the thoracic lymphatic and bile ducts, as well as in the detection of Disse spaces after ligation of the ducts.*

Key words*: experimental, dog, lymphatic vessels, liver, pathomorphological changes, thoracic lymphatic duct. hematoxylin and eosin, picrofuchsin according to Van Gieson.*

Kirish. Jigarning limfatik tizimining funksional morfologiyasi hozirgi kunda barcha tafsilotlari bilan yetarlicha o`rganilgan. Uning ichki organ limfatik tizimi fibrinogen, oqsil, katta miqdordagi suyuqlik va boshqalarni qon aylanish tizimiga tashishda muhim rol o`ynaydi. Masalan, jigarda limfa turg`unligining atigi 1,5 soat davom etishi seroz yallig`lanishning gistologik manzarasini keltirib chiqarishi mumkin [4,6,7]. Jigardan limfaning asosiy qismi ko`krak limfatik yo`li orqali oqib chiqadi deb hisoblanadi. Bu yo`l ko`pincha klinik sharoitlarda, operatsiyalar vaqtida shikastlanganda bog`lanadi [3,5]. Demak, bu aralashuv jigarda limfa aylanishining

vaqtincha buzilishiga olib kelishi mumkin. Ko`krak limfatik yo`lining bog`lanishining jigarning ichki limfatik tizimiga ta'sirini o`rganishga bag`ishlangan maxsus tadqiqotlar soni juda oz [1,8]. Ko`krak limfatik yo`li va o`ng limfatik magistral bog`langanda Disse bo`shliqlarining aniqlanishi, shuningdek, limfa aylanishining buzilishi natijasida jigarda yuzaga keladigan patomorfologik o`zgarishlarni o`rganish bo`yicha alohida morfologik tasvirlar mavjud [2,9].

Tadqiqot maqsadi: Biz itlarda jigarning ichki limfatik tizimining patomorfologik holatini o`rganishni maqsad qilib qo`ydik.

Tadqiqot materiallari va usullari: Tajribalar 20 ta hayvon ustida o`tkazildi. Umumiy og`rigsizlantirish ta`sirida itlarda ko`krak limfatik yo`li bo`yin sohasida venoz burchakga guyilish joyidan bog`landi. Hayvonlar yo`l bog`langanidan keyin 2-3 kun, 6-7 kun va 2-4 hafta o`tgach so`yildi. Gistologik preparatlar gematoksilin-eozin, Van-Gizon bo`yicha pikrofuksin, Fut bo`yicha argirofil tolalar va Veygert bo`yicha elastik tolalar usullari bilan bo`yaldi.

Tadqiqot natijalari: Operatsiyadan 2 kun o`tgach, ichki limfatik tarmoqning sezilarli darajada kengayishi kuzatildi. Lobulalararo va qon tomirlari atrofidagi biriktiruvchi to`qimalardan o`tuvchi kengaygan limfatik tomirlar limfa bilan to`lib, pushti rangda bo`yalgan edi. Jigar venalari atrofida joylashgan biriktiruvchi to`qimadagi limfatik kapillyarlar ham diametri jihatidan kattalashgan. Lobulalararo biriktiruvchi to`qima, limfatik va qon tomirlari, shuningdek, o`t yo`llarini o`rab turgan barcha to`qimalar sezilarli darajada shishgan edi. Operatsiyadan 3 kun o`tgach, limfatik tomirlar yanada kengaygan. Lobulalararo va qon tomirlari atrofidagi limfatik tarmoq kapillyarlari orasida, ichida alohida eritrotsitlar bo`lgan limfatik tomirlar uchraydi. Lobulalararo biriktiruvchi to`qimaning shishi sezilarli darajada edi. Operatsiyadan 6-7 kun o`tgach, lobulalararo biriktiruvchi to`qimaning shishi va limfatik tomirlarning kengayishi o`zgarishsiz qoldi. Operatsiyadan 2 hafta o`tgach, jigardagi limfatik tomirlarning kengayishi bilan birga, bizning tajribalarimizda kuzatilgan o`zgarishlar kamroq yaqqol bo`ldi.

Xulosa: Bu o`zgarishlar odatda operatsiyadan so`ng darhol yuzaga kelmadi, balki asta-sekin rivojlanib, operatsiyadan keyin 3-6-kunlarda limfatik tomirlarning kengayishi va biriktiruvchi to`qimaning shishi sifatida eng yaqqol ko`rindi. Shubhasiz, bu o`zgarishlar organ limfatik tizimidagi funksional o`zgarishlarning aksidir. Olingan ilmiy ma`lumotlar amaliyotda ko`krak a`zolarining limfa qon – tomirlarida bo`ladigan anatomo – gistologik o`zgarishlarda, jigarning lima tizimida bo`ladigan o`zgarishlarni asoslaydi.

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PUL OQIMLARINI JORIY QIYMATI ASOSIDA BAHOLASH

Annotatsiya: *Ushbu maqolada pul oqimlarining joriy (diskontlangan) qiymatini hisoblash orqali ularni solishtirish va iqtisodiy jihatdan eng maqbul variantni tanlash usullari ko‘rib chiqiladi. Maqolada uch xil pul oqimi ketma-ketligi misolida (A, B, C) foiz stavkasi o‘zgarishiga qarab qaysi ketma-ketlik afzal ekani tahlil qilinadi.*

Kalit so’zlar: *pul oqimi, diskontlash, foiz stavkasi, nominal foiz.*

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VALUATION BASED ON THE PRESENT VALUE OF CASH FLOWS

Annotation: *This article explores methods for comparing cash flows and selecting the most economically optimal option based on the calculation of their present (discounted) value. Using three different cash flow sequences (A, B, and C), the analysis determines which sequence is preferable depending on changes in the interest rate.*

Keywords: *cash flow, discounting, interest rate, nominal interest.*

Faraz qilaylik, har bir davr uchun davriy kapitalizatsiya qilinadigan **nominal stavka** r bo‘yicha pulni ham qarzga olish, ham qarzga berish mumkin. Bunday sharoitda, i**-davr** oxirida to‘lanadigan v **pul.bir.** miqdoridagi to‘lovning **hozirgi qiymati** qancha bo‘ladi? Chunki $v(1+r)^{-i}$ miqdoridagi bank qarzi i**-davrda** v miqdorida qaytarishni talab qiladi, shundan kelib chiqadiki, i**-davrda to‘lanadigan** v **miqdoridagi to‘lovning hozirgi qiymati** $v(1+r)^{-i}$ ga teng bo‘ladi [1-2].

Joriy qiymat tushunchasi bizga turli daromad oqimlarini taqqoslash va qaysi biri afzalroq ekanligini aniqlash imkonini beradi [1-5].

Misol1. Faraz qilaylik, keyingi besh yil davomida har yil oxirida (ming pul.bir.larda) to‘lovlar olasiz. Quyidagi uch to‘lov ketma-ketligidan qaysi biri afzalroq?

A.	12,	14,	16,	18,	20;
B.	16,	16,	15,	15,	15;
C.	20,	16,	14,	12,	10

Yechim. Agar nominal foiz stavkasi r bo‘lib, u har yili kapitalizatsiya qilinadigan bo‘lsa, unda x_i $(i = 1,2,3,4,5)$ to‘lovlar ketma-ketligining hozirgi qiymati quyidagicha bo‘ladi:

$$\sum_{i=1}^{5}(1+r)^{-i}x_i,$$

hozirgi qiymati eng katta bo‘lgan ketma-ketlik afzal hisoblanadi. Shunday qilib, to‘lovlar ketma-ketligining qaysi biri ustunligi **foiz stavkasiga bog‘liq** bo‘ladi.

Jadval 1. Joriy qiymatlar

Foiz stavkasi r	A to’lov ketma-ketligi	B to’lov ketma-ketligi	C to’lov ketma-ketligi
0,1	59,21	58,60	56,33
0,2	45,70	46,39	45,69
0,3	36,49	37,89	38,12

Agar r kichik bo‘lsa, unda A **ketma-ketligi** eng yaxshi bo‘ladi, chunki uning umumiy to‘lovlari eng yuqori. r biroz katta bo‘lsa, unda B **ketma-ketligi** eng yaxshi bo‘ladi, chunki garchi uning umumiy to‘lovi (77) A ning to‘lovidan (80) kam bo‘lsada B ning dastlabki to‘lovlari A dagilariga nisbatan kattaroqdir. Agar r yanada katta bo‘lsa, unda C **ketma-ketligi** eng yaxshi bo‘ladi, chunki uning dastlabki to‘lovlari A va B dagilardan ham yuqoriroq.**Jadval.1** ushbu to‘lov oqimlarining uch xil r qiymati uchun hozirgi qiymatlarini ko‘rsatadi.

Shuni ta’kidlash kerakki, to‘lovlar ketma-ketligini istalgan belgilangan vaqt nuqtasidagi qiymatlari asosida taqqoslash mumkin. Masalan, ularni **5-davr nuqtasidagi qiymatlar** bo‘yicha taqqoslash uchun, quyidagi ifodani hisoblab, qaysi ketma-ketlik eng katta qiymat berishini aniqlaymiz:

$$\sum_{i=1}^{5}(1+r)^{5-i}x_i = (1+r)^5\sum_{i=1}^{5}(1+r)^{-i}x_i.$$

Demak, biz ilgari olgan afzalliklar tartibini (foiz stavkasining funksiyasi sifatida) bu yerda ham qayta qaytaolamiz .

Natija. Yillik kapitalizatsiya qilinadigan r foiz stavkasi berilgan bo‘lsin. Har bir $i = \overline{1,n}$ uchun yil oxirida sizga a_i **pul.bir.** keltiradigan $a = a_1, a_2, \dots, a_n$pul oqimi quyidagicha qayta tiklanishi mumkin:

$$PV(a) = \frac{a_1}{1+r} + \frac{a_2}{(1+r)^2} + \dots + \frac{a_n}{(1+r)^n}$$

ushbu qiymatni **0-vaqtda** bankka qo‘yish va keyin ketma-ket $a_1, a_2, \dots, a_n$mablag‘larni yechib olish orqali amalga oshiriladi.

Bu da’voni tekshirish uchun quyidagiga e’tibor bering: **1-yil oxirida** a_1 **mablag‘ni yechib olish** sizni quyidagi holatda qoldiradi

$$(1+r)\left(\frac{a_1}{1+r} + \frac{a_2}{(1+r)^2} + \dots + \frac{a_n}{(1+r)^n}\right) - a_1 = \frac{a_2}{1+r} + \dots + \frac{a_n}{(1+r)^{n-1}}$$

bankdagi omonatda qoladi. Demak, **2-yil oxirida a_2 mablag‘ni yechib olganingizdan** so‘ng, quyidagiga ega bo‘lasiz:

$$(1+r)\left(\frac{a_2}{1+r}+\ \ldots+\frac{a_n}{(1+r)^{n-1}}\right)-a_2=\frac{a_3}{1+r}+\ \ldots+\frac{a_n}{(1+r)^{n-2}}.$$

Davom ettirib aytadigan bo‘lsak, $i<n$ bo‘lganda **i-yil oxirida a_i mablag‘ni yechib olish** sizni quyidagi holatda qoldiradi:

$$\frac{a_{i+1}}{1+r}+\ \ldots+\frac{a_n}{(1+r)^{n-i}}$$

bankdagi omonatda qoladi.

Demak, a_{n-1} **ni yechib olganingizdan so‘ng**, bankda $\frac{a_n}{1+r}$ qoladi va bu keyingi yil oxirida amalga oshiriladigan a_n **miqdoridagi yechim** uchun aynan yetarli bo‘ladi.

Xuddi shuningdek, $a_1, a_2, \ldots, a_n$ pul oqimi ketma-ketligi $PV(a)$ boshlang‘ich kapitalga aylantirilishi mumkin. Buning uchun bu miqdorni bankdan qarzga olib, keyinchalik ushbu pul oqimi orqali qarzni qoplash kifoya.

Shunday qilib, har qanday pul oqimi ketma-ketligi o‘zining hozirgi qiymatiga teng boshlang‘ich tushumga ekvivalent bo‘ladi. Bu esa shuni anglatadiki, **bir pul oqimi ketma-ketligi boshqasiga nisbatan afzal hisoblanadi — agar birinchining hozirgi qiymati ikkinchisining hozirgi qiymatidan katta bo‘lsa.**

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ODAMLARDA O'T PUFAGI KASALIKLARIDA A`ZONING INTRAMURAL NERV TIZIMINING NEYROGISTOLOGIK O'ZGARISHLARI

Rezyume: *Maqolada yozilishicha xoletsistit kasaligi tufayli operatsiya qilingan 17 bemorda o't pufagining interamural nerv tuzulmalari neyrogistologik tekshirish usullarida o'rganilgan, Shundan: o'tkir flegmonoz xoletsistitlar – 2 ta, o'tkir gangrenoz xoletsistitlar – 2 ta, surunkali takrorlanuvchi kalkulyoz xoletsistitlar – 13 ta materal uchun olingan. Surunkali takrorlanuvchi kalkulyoz xoletsistitlarda o't pufagining interamural nerv chigallari va tolalarida ancha og'ir distrofik o'zgarishlar kuzatilib, nerv hujayralarining nekroziga va bo'shliqlar paydo bo'lishiga olib keladi.*

Kalit so'zlar: *o't pufagi, xoletsistitlar, yallig'lanish, morfologik o'zgarishlar, tolalar, nerv hujayralari, Gematoksilin-eozin usuli, Bilshovskiy-Gros usuli.*

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NEUROHISTOLOGICAL CHANGES IN THE INTRAMURAL NERVOUS SYSTEM OF THE ORGAN IN HUMAN GALLBLADDER DISEASES

Abstract: *The article states that neurohistological research methods were used to study the intramural nerve structures of the gallbladder in 17 patients who underwent surgery for cholecystitis, including: acute phlegmonous cholecystitis - 2, acute gangrenous cholecystitis - 2, chronic recurrent calculous cholecystitis - 13. In chronic recurrent calculous cholecystitis, fairly pronounced dystrophic changes are observed in the interamural nerve tangles and fibers of the gallbladder, leading to necrosis of nerve cells and formation of ruptures.*

Keywords: *gallbladder, cholecystitis, inflammation, morphological changes, fibers, nerve cells, hematoxylin-eosin method, Bielshovsky-Gross method.*

Kirish: Odamlarda o`t pufagida uchraydiga yaliglanish va o`t tosh kasaloklarida organning intramural asab chigallarida neyrogistologik o`zgarishlarni o`rgangan ilmiy ma`lumotlar kam uchraydi. O`t pufagidagi patologik jarayonlar, tizimidagi o'zgarishlar uning motor funktsiyasining buzilishiga olib kelishi mumkin

[3,4,5]. O't qopida dimlanishga, surunkali yallig'lanish jarayonini qo'llab-quvvatlashga, kasallikning kuchayishiga va o't tosh kasalligining rivojlanishiga yordam beradi [1,2]. Bir qancha olimlar o`t pufagining anatomo-gistologik tuzilishlarini va intramural nerv tizimini tajriba hayvonlarida soglom holatda o`rganishgan. Ammo o`t pufagining kasaliklarida nerv tolalarini o`rganilgan ilmiy ma`lumotlarni toppish juda qiyin. Buni hisobga olib, biz ushbu tadqiqotni o'tkazdik.

Tadqiqot maqsadi. Odamlarda o't pufagi kasaliklarida a`zoning intramural nerv tizimining neyrogistologik o'zgarishlarini o`rganish.

Tadqiqot materiallari va usullari. Bemorlarning yoshi: 26 yoshdan 40 yoshgacha - 4; 40 yoshdan 50 yoshgacha - 6; 50 yoshdan 60 yoshgacha - 3; 60 yoshdan yuqori - 4. O't pufagining turli qismlari gistologik tekshiruvdan o'tkazildi: bo'yin, tana, tubi. Gematoksilin-eozin, Vanizon bo'yicha oddiy bo'yash usullari, shuningdek Lavrentev modifikatsiyasidagi Bilshovskiy-Gros bo'yicha maxsus neyrogistologik usullar va Nissl bo'yicha Erlih dionini qo'llanildi. Materialni umumlashtirishda biz hollarni 2 ta asosiy guruhga ajratdik.

Tadqiqot natijalari. Birinchi guruhga o'tkir xoletsistitning 4 ta holati, 2-guruhga surunkali takrorlanuvchi kalkulyoz xoletsistitning 13 ta holati kiritilgan. Tadqiqotlar shuni ko'rsatdiki, xoletsistitlarda o't pufagining asab elementlarida turli xil morfologik o'zgarishlar yuzaga keladi, ular funktsional, distrofik va regenerativ-kompensatorlik bilan farqlanadi. O'tkir xoletsistitlarda morfologik o'zgarishlar faqat funktsional va qaytar distrofik o'zgarishlar bilan tavsiflanadi. Birinchi navbatda, terminal retseptor tolalarining va ularning uchlarining funktsional va distrofik o'zgarishlari e'tiborni tortadi. Terminallardagi distrofik o'zgarishlar shishishi, yuqori argentofiliyasi va ularning yo'nalishi bo'yicha o'qsimon qalinlashuvlar paydo bo'lishi bilan tavsiflanadi. Asab tolalarida o'tadigan qalin sezgir tolalarda yanada qo'pol o'zgarishlar aniqlangan bo'lib, ular yanada massiv varikozliklarning va hatto vakuolizatsiyaning paydo bo'lishi bilan tavsiflanadi. Gangliyalarning asab hujayralarida siqilish tipidagi distrofik o'zgarishlar ustunlik qiladi. Ular hujayralarning o'lchamlarining kamayishi, Bilshovskiy-Gros bo'yicha kumush bilan intensiv diffuz impregnirovka bilan tavsiflanadi. Surunkali takrorlanuvchi kalkulyoz xoletsistitda o't pufagining submukozal qavatida joylashgan retseptorning terminal tolasining shishishi, yuqori argentofiliyasi va varikozliklarning paydo bo'lishi kuzatiladi. Nissl bo'yicha siqilgan hujayralarda Nissl donalarining yopishishi, yadrolarning bazofiliyasi yoki hujayralarning dionin bilan diffuzli intensiv bo'yalishi kuzatiladi. Shuning bilan birga, vokalli protoplazma bo'lgan hujayralar ham uchraydi. Surunkali kalkulyoz takrorlanuvchi xoletsistitlarda, o'tkir shakllardan farqli o'laroq, o't pufagining asab elementlarining o'zgarishlarining ancha katta polimorfizmi e'tiborni tortadi. Distrofik o'zgarishlardan tashqari, ko'rib chiqilayotgan kuzatuvlar guruhida asab tolalarining regenerativ o'zgarishlari va asab hujayralarining atrofiyasi ko'pincha aniqlangan bo'lib, ularni surunkali, uzoq davom etadigan jarayonning ifodasi sifatida baholash mumkin. Reseptorlardagi morfologik o'zgarishlar o'tkir xoletsistitlarda kuzatilgan o'zgarishlardan sezilarli darajada farq qilmadi, shuning uchun ular o't pufagi devoridagi yallig'lanish jarayonining kuchayishi bilan bog'liq deb o'ylash mumkin.

Ushbu o'zgarishlar shishish, argentofiliyaning oshishi va терминале va buta shaklida bo'lgan oxirgi tarmoqlarda varikoz tomirlarining paydo bo'lishi bilan tavsiflanadi. Qalin sezgir nerv tolalarida o'tkir xoletsistitga xos o'zgarishlardan tashqari, ba'zan parchalanish, shuningdek, o'sib borayotgan, bir-biri bilan o'ralashgan nerv tolalaridan tashkil topgan o'sish lampochkalari va nevroma kabi tuzilmalarning paydo bo'lishi bilan tavsiflangan regenerativ o'zgarishlar aniqlandi. Nerv hujayralarida morfologik o'zgarishlarning ikki asosiy turi e'tiborni tortdi: retrograd tipdagi distrofik o'zgarishlar va nerv hujayralarining atrofiyasi. Hujayralarning retrograd tipdagi distrofik o'zgarishlari hujayralarning shishishi, yadrolarning ektopiyasi, markaziy va to'liq xromatoliz bilan tavsiflangan, bu karioliz va karyotsitolizga yetdi. Atrofik o'zgarishlar ichki tuzilishini saqlab qolgan holda nerv hujayralarining hajmining kamayishi bilan tavsiflangan. Shu bilan birga, gangliylarda keskin atrofiyalangan hujayralar bilan bir qatorda, biz kompensator gipertrofiya ifodasi sifatida ko'rib chiqishga moyil bo'lgan yagona yirik nerv hujayralari aniqlanishi e'tiborni tortdi. Atrofiyalangan hujayralarda ko'pincha retrograd o'zgarishlarga xos bo'lgan manzara kuzatiladi.

Xulosa. O'tkir xoletsistitlarda terminal retseptor nerv tolalarida, nerv o'tkazgichlarida va hujayralarda funktsional va kam ifodalangan distrofik o'zgarishlar aniqlanadi.Surunkali qaytalanuvchi kalkulyoz xoletsistitlarda o't pufagining nerv elementlarida qo'pol distrofik o'zgarishlar kuzatiladi, ular nerv hujayralarining nekroziga va bo'sh hududlarning paydo bo'lishiga yetadi. Shu bilan birga, nerv hujayralarining atrofiyasi va nerv tolalarining regeneratsiyasi ko'pincha uchraydi. O't pufagi nerv hujayralarining atrofiyasi va nekrozi uning motor va sekretor funktsiyalarining buzilishiga olib keladi, bu esa tarkibning turg'unligiga, surunkali yallig'lanish jarayonini qo'llab-quvvatlashga, kuchayishning paydo bo'lishiga va o't toshi kasalligining rivojlanishiga yordam beradi.

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KIBERHUJUM TURLARINI ANIQLASH VA ULARGA QARSHI SAMARALI STRATEGIYALAR

Annotatsiya: *Ushbu maqolada zamonaviy kiberhujum turlari, ularning tahlili va ularning oqibatlarini kamaytirishga qaratilgan samarali strategiyalar ko‘rib chiqiladi. Kiberxavfsizlik sohasidagi tahdidlar kundan-kunga murakkablashib borayotganligi sababli, tashkilot va foydalanuvchilarning axborot resurslarini himoya qilish uchun samarali yondashuvlar ishlab chiqilishi talab etiladi. Maqolada DDoS, phishing, ransomware, man-in-the-middle, zero-day kabi hujum turlarining xususiyatlari va ularni aniqlash usullari tahlil qilinadi. Shuningdek, xavfni kamaytirish bo‘yicha profilaktik choralar, ilg‘or tahlil vositalari va avtomatlashtirilgan monitoring tizimlarining roli yoritiladi. Ilmiy ishda statistik ma’lumotlar, amaliy misollar hamda xalqaro tajriba asosida ishlab chiqilgan strategiyalar asosida xulosa va takliflar berilgan.*

Kalit so‘zlar: *kiberhujum, axborot xavfsizligi, DDoS, phishing, ransomware, himoya strategiyasi, tarmoq xavfsizligi, tahdid tahlili, avtomatlashtirilgan monitoring, zararli dastur, xavfni aniqlash, profilaktika.*

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IDENTIFICATION OF TYPES OF CYBER ATTACKS AND EFFECTIVE STRATEGIES TO COUNTER THEM

Abstract: *This article examines modern types of cyberattacks, their characteristics, and effective strategies to mitigate their consequences. As threats in the field of cybersecurity are becoming increasingly complex, there is a growing need for robust approaches to protect organizational and individual information assets. The study analyzes various types of attacks such as DDoS, phishing,*

ransomware, man-in-the-middle, and zero-day exploits. It also explores detection methods, prevention techniques, and the role of advanced analytical tools and automated monitoring systems. The article is based on statistical data, real-world examples, and internationally recognized practices, offering conclusions and recommendations for effective cyber defense.

Keywords: *cyberattack, information security, DDoS, phishing, ransomware, protection strategy, network security, threat analysis, automated monitoring, malware, threat detection, prevention.*

KIRISH

Axborot texnologiyalarining jadal sur’atlarda rivojlanishi bugungi davrda hayotimizning barcha sohalariga katta ta’sir ko‘rsatmoqda. Internet va raqamli texnologiyalarning keng ommalashuvi natijasida ko‘plab qulayliklar yaratilgani bilan birga, turli tahdidlar, xususan, kiberhujumlar xavfi ham ortib bormoqda. Axborot resurslari, kompyuter tarmoqlari va mobil qurilmalar orqali amalga oshirilayotgan hujumlar ko‘plab shaxsiy va korporativ ma’lumotlarning o‘g‘irlanishiga, buzilishiga yoki yo‘q bo‘lishiga olib kelmoqda. Xususan, so‘nggi yillarda davlat muassasalari, moliyaviy tashkilotlar, sog‘liqni saqlash tizimi va ta’lim sohalarida yuz bergan kiberhujumlar millionlab foydalanuvchilarning ma’lumotlarini xavf ostiga qo‘ymoqda. Bu esa zamonaviy jamiyat oldida kiberxavfsizlikni ta’minlash masalasini ustuvor yo‘nalishlardan biriga aylantirmoqda.

Kiberxavfsizlik — bu axborotni ruxsatsiz kirish, o‘zgartirish, yo‘qotish yoki oshkor etilishdan himoya qilishga qaratilgan chora-tadbirlar yig‘indisidir. Bu soha nafaqat dasturiy ta’minot va texnik vositalarni o‘z ichiga oladi, balki foydalanuvchilarning xatti-harakati, tashkilotlarning siyosati va milliy xavfsizlik darajasidagi choralarni ham qamrab oladi. Kiberhujumlar o‘z tabiatiga ko‘ra turli shakllarda namoyon bo‘lishi mumkin. Masalan, DDoS (Distributed Denial of Service) hujumlari orqali ma’lum bir veb-resurs yoki tarmoq xizmatining ish faoliyatiga xalaqit beriladi; phishing orqali foydalanuvchilarning login-parollari va boshqa shaxsiy ma’lumotlari firibgarlik yo‘li bilan qo‘lga kiritiladi; ransomware dasturlari yordamida qurilma yoki tizimdagi ma’lumotlar shifrlanib, ularni qayta tiklash evaziga pul talab qilinadi; zero-day hujumlar esa hali aniqlanmagan yoki yamoqlanmagan zaifliklardan foydalanadi.

Mazkur maqolada yuqoridagi kabi keng tarqalgan va xavfli kiberhujum turlari chuqur tahlil qilinadi. Har bir hujum turining texnik jihatlari, aniqlash usullari va ularni oldini olishga qaratilgan profilaktik choralar o‘rganiladi. Ayniqsa, zamonaviy kiberxavfsizlik tizimlarida sun’iy intellekt, mashinali o‘rganish (machine learning), avtomatlashtirilgan tahlil vositalari va real vaqtda kuzatuv tizimlarining roli yoritiladi. Shuningdek, xalqaro tajriba asosida ishlab chiqilgan samarali himoya strategiyalari, ISO/IEC 27001 kabi standartlar va xavfsizlik protokollari haqida ham ma’lumot beriladi.

Ko‘plab tashkilotlar va foydalanuvchilar hali ham kiberxavf tahdidlariga yetarlicha tayyor emas. Ko‘pincha, kiberhujum faqat sodir bo‘lgandan keyingina

uni aniqlash choralari ko‘riladi. Shu boisdan ham bu maqola orqali kiberhujumlarni erta aniqlash, samarali qarshi chora ko‘rish va xavflarni minimallashtirish yo‘llarini ilmiy asosda ochib berish maqsad qilingan. Maqolada statistik ma’lumotlar, amaliy misollar va dolzarb holatlar asosida fikrlar bayon qilinadi. Natijada, ushbu maqola kiberxavfsizlik sohasida faoliyat yurituvchi mutaxassislar, axborot texnologiyalari bilan shug‘ullanuvchi ilmiy tadqiqotchilar hamda siyosat ishlab chiquvchilar uchun amaliy ahamiyatga ega bo‘ladi.

Adabiyotlar tahlili va metodlar

Kiberxavfsizlik va kiberhujumlar sohasidagi tadqiqotlar oxirgi o‘n yillikda jadal sur’atlar bilan rivojlanmoqda. Jahon ilmiy maydonida bu borada yetakchi tadqiqotlar olib borayotgan muassasalar, IT kompaniyalar va mustaqil mutaxassislar tomonidan turli maqolalar, monografiyalar hamda xalqaro standartlar ishlab chiqilgan. Xususan, Kevin Mitnik, Bruce Schneier, Ross Anderson kabi mualliflar tomonidan yozilgan fundamental asarlar kiberxavfsizlikning nazariy va amaliy jihatlarini yoritadi. Ushbu manbalarda DDoS, phishing, ransomware, zero-day va boshqa kiberhujumlar turlari chuqur o‘rganilgan, ularni aniqlash va tahlil qilishda qo‘llaniladigan yondashuvlar taklif qilingan.

Shuningdek, ISO/IEC 27001, NIST Cybersecurity Framework va OWASP Top 10 kabi xalqaro standartlar kiberxavfsizlik bo‘yicha ilg‘or amaliyotlarni taklif etadi. Ushbu hujjatlar tashkilotlar uchun xavfsizlik siyosatini ishlab chiqish, tahdidlarni baholash va qarshi choralarni belgilashda muhim ahamiyat kasb etadi. Scopus, IEEE Xplore, ScienceDirect kabi ilmiy platformalarda e’lon qilingan maqolalarda ham kiberhujumlarning texnik tafsilotlari, ularning aniqlash usullari, avtomatlashtirilgan monitoring vositalari va xavflarni kamaytirish strategiyalari yoritilgan. Aksariyat zamonaviy tadqiqotlarda mashinali o‘rganish, sun’iy intellekt va blokcheyn texnologiyalarining xavfsizlikka tatbiqi alohida urg‘u bilan ko‘rib chiqilmoqda.

Mahalliy adabiyotlarda ham kiberxavfsizlikning umumiy tushunchalari, axborotni himoyalash vositalari, tarmoq xavfsizligi va dasturiy vositalar haqida dolzarb ma’lumotlar mavjud. Biroq, kiberhujum turlarining chuqur tahlili va real vaqt rejimidagi aniqlash texnologiyalariga oid tadqiqotlar cheklangan. Shu sababli, ushbu ilmiy ishda xalqaro va mahalliy adabiyotlar qiyosiy tahlil qilinib, mavjud bo‘shliqlarni to‘ldirishga harakat qilinadi.

Mazkur ilmiy ishda kiberhujumlarni aniqlash va ularga qarshi samarali strategiyalarni ishlab chiqish uchun bir nechta metodologik yondashuvlar qo‘llanildi. Birinchi navbatda, **taqqoslov tahlil usuli** yordamida kiberhujumlarning turlari va ularni aniqlash usullari o‘rganilgan. DDoS, phishing, ransomware kabi hujumlar texnik va ijtimoiy jihatlari bo‘yicha solishtirilib, ularning xususiyatlari aniqlashtirildi.

Ikkinchi usul sifatida **vaziyatli tahlil (case study)** yondashuvi qo‘llanildi. Xalqaro tajribalarda sodir bo‘lgan real kiberhujum holatlari, ularning oqibatlari va ularni bartaraf etish choralari tahlil qilindi. Masalan, 2017-yilgi WannaCry ransomware hujumi va 2021-yilgi Colonial Pipeline hodisasi asosida kiberhujumlarning iqtisodiy va xavfsizlik oqibatlari o‘rganildi.

Shuningdek, **SWOT tahlil** usuli orqali mavjud xavfsizlik strategiyalarining kuchli va zaif jihatlari baholandi. Bu yondashuv orqali samarali qarshi strategiyalarni ishlab chiqishda qanday omillar muhim ekani aniqlashtirildi. Bundan tashqari, **statistik tahlil** asosida so‘nggi yillarda sodir bo‘lgan kiberhujumlar soni, ularning turlari va ta’sir darajasi bo‘yicha ma’lumotlar o‘rganildi. Olingan natijalar asosida tahdid darajasi va ularning ehtimolligi baholandi.

Yana bir muhim metod – **ekspert baholash** bo‘lib, kiberxavfsizlik sohasida faoliyat yuritayotgan mutaxassislarning fikr va mulohazalari asosida tavsiyalar ishlab chiqildi. Tadqiqot davomida zamonaviy xavfsizlik vositalarining samaradorligi ham laborator sharoitda sinovdan o‘tkazildi. Bu esa ilmiy ishning amaliy ahamiyatini oshiradi.

Natijada, adabiyotlar tahlili va metodik yondashuvlar asosida kiberhujumlarni aniqlash va samarali qarshi strategiyalarni ishlab chiqishga xizmat qiluvchi ilmiy asoslar shakllantirildi.

Natijalar

Ushbu tadqiqot davomida kiberhujum turlarining eng ko‘p uchraydigan shakllari, ularning sodir bo‘lish tezligi, aniqlanishi va ularga qarshi qo‘llanilayotgan strategiyalar chuqur tahlil qilindi. Tadqiqotga asoslangan holda bir nechta statistik va grafik natijalar quyida taqdim etiladi.

Kiberhujumlar turlarining uchrash chastotasi (2023-yil ma’lumotlariga asoslangan holda)

Jadvalda kiberhujumlarning asosiy turlari va ularning global miqyosdagi foiz ko‘rsatkichlari aks ettirilgan.

1-jadval. Kiberhujumlar turlari va ularning uchrash chastotasi

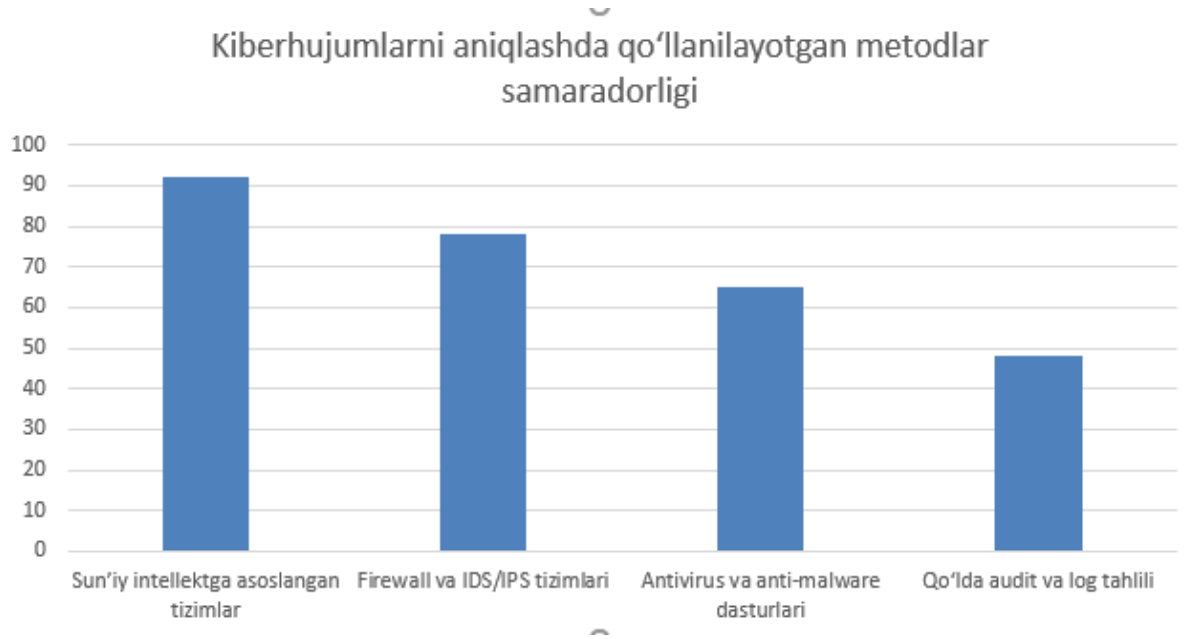
№	Hujum turi	Uchrash chastotasi (%)
1	Phishing	36%
2	Ransomware	21%
3	DDoS	17%
4	Zero-Day Exploits	9%
5	Man-in-the-middle	7%
6	Malware	10%

Mazkur natijalar shuni ko‘rsatadiki, phishing hujumlari hozirda eng keng tarqalgan hujum shaklidir. Ularning asosiy sababi insoniy omillarga, ya’ni foydalanuvchilarning xatolariga bog‘liq bo‘lishidadir.

Aniqlash samaradorligi bo‘yicha himoya usullarining solishtirma tahlili

Tadqiqot davomida turli himoya strategiyalarining aniqlash samaradorligi ham baholandi. Quyidagi diagramma bu boradagi asosiy metodlar samaradorligini ko‘rsatadi.

1-diagramma. Kiberhujumlarni aniqlashda qo‘llanilayotgan metodlar samaradorligi (%)



Natijalari shuni ko‘rsatmoqdaki, kiberhujumlar bugungi raqamli dunyoda dolzarb va keng tarqalgan xavf-xatar hisoblanadi. Ayniqsa, **phishing** va **ransomware** kabi hujumlar foydalanuvchilarning e’tiborsizligi va zaif axborot xavfsizlik siyosati sababli tez-tez uchramoqda. **Phishing** hujumlarining yuqori chastotasi inson omiliga bog‘liq bo‘lib, foydalanuvchilarning noto‘g‘ri xatti-harakatlari bu turdagi tahdidlarni osonlashtiradi. Shu sababli foydalanuvchilarni muntazam ravishda xabardor qilish va kibersavodxonlikni oshirish muhim ahamiyat kasb etadi.

Sun’iy intellekt va mashinali o‘rganishga asoslangan tizimlar hujumlarni aniqlashda eng yuqori samaradorlikni ko‘rsatmoqda. Biroq, bu texnologiyalarni joriy etish uchun muayyan infratuzilma, malakali mutaxassislar va moliyaviy resurslar talab qilinadi. Aksariyat tashkilotlarda bu imkoniyatlar yetarli darajada mavjud emas. Shuningdek, **IDS/IPS tizimlari**, **antivirus dasturlari** va **tarmoq monitoringi** texnologiyalari ham kiberhujumlarni oldindan aniqlash va to‘xtatishda muhim rol o‘ynaydi, biroq ularning ko‘plab kamchiliklari, xususan, noto‘g‘ri ijobiy xabarlar (false positive) va yangilanish talab qiluvchi xususiyatlari mavjud.

Kiberhujumlar oqibatidagi zararlar tahlili, ayniqsa, ransomware hujumlarining iqtisodiy oqibatlari haqida jiddiy fikr yuritishga undaydi. Ko‘plab tashkilotlar hali ham ehtiyot choralari ko‘rmaguncha, ya’ni hujum sodir bo‘lganidan keyingina chora ko‘ra boshlaydilar. Bu esa iqtisodiy yo‘qotishlarni yanada kuchaytiradi. **Proaktiv xavfsizlik yondashuvlari**, masalan, xavflarni baholash, tizimli monitoring, foydalanuvchi xatti-harakatlarini tahlil qilish kabi choralar hali yetarlicha keng joriy etilmagan.

Boshqa bir muhim masala — **hujumlarni real vaqt rejimida aniqlash va to‘xtatish mexanizmlarining rivojlanmaganligi**. Ko‘plab himoya tizimlari hujum

sodir bo‘lgandan keyin javob berishga asoslangan. Bu holat kiberjinoyatchilarga ma’lumotlarga kirish va zarar yetkazish uchun yetarli vaqt beradi. Bu borada real vaqtli kuzatuv va avtomatlashtirilgan qaror qabul qilish tizimlarining takomillashtirilishi zarur.

Tahlillar shuni ko‘rsatmoqdaki, ko‘plab tashkilotlar xalqaro xavfsizlik standartlariga (masalan, ISO/IEC 27001) to‘liq mos kelmaydi. Bu esa ularning hujumlarga nisbatan immunitetini susaytiradi. Bunday muassasalar uchun xavfsizlik siyosatlari, xodimlarni o‘qitish tizimi va doimiy monitoring mexanizmlarini joriy etish zarur.

Muhokama davomida yana bir muhim xulosa shuki, texnologik echimlar bilan bir qatorda **inson omili** va **korporativ madaniyat** ham kiberxavfsizlikda hal qiluvchi rol o‘ynaydi. Har bir foydalanuvchi o‘zining axborot xavfsizligiga mas’uliyat bilan yondashmasa, eng zamonaviy texnologiyalar ham to‘liq samaradorlik bera olmaydi. Shuning uchun tashkilotlar xavfsizlikni faqat IT bo‘limiga yuklamasdan, butun jamoani jalb etuvchi yondashuvni tanlashi lozim.

Kiberhujumlar bilan kurashda yagona universal yechim yo‘q. Bu muammoga kompleks, ko‘p bosqichli va uzluksiz rivojlanishga asoslangan yondashuv zarur. Ushbu ilmiy ish aynan shunday yondashuvlarni aniqlash va takomillashtirishga qaratilgan bo‘lib, amaliy tavsiyalarni ishlab chiqishda asos bo‘lib xizmat qilishi mumkin

Xulosa

Kiberxavfsizlik muammosi zamonaviy jamiyatda tobora dolzarb ahamiyat kasb etmoqda. Ushbu maqolada kiberhujumlarning asosiy turlari, ularning tarqalish sabablari va oqibatlari, shuningdek, bu hujumlarga qarshi samarali strategiyalar tahlil qilindi. Tahlillar asosida aniqlanishicha, phishing, ransomware va DDoS hujumlari eng ko‘p uchraydigan xavf turlaridir. Ularning asosiy sabablari orasida inson omili, zaif xavfsizlik siyosatlari va eskirgan himoya vositalari mavjud.

Tadqiqot davomida eng samarali himoya strategiyalari sifatida sun’iy intellekt asosidagi xavf aniqlash tizimlari, IDS/IPS texnologiyalari, foydalanuvchi xatti-harakatlarini kuzatish vositalari va muntazam xavfsizlik auditi bo‘yicha chora-tadbirlar taklif etildi. Ayniqsa, real vaqtli tahlil va avtomatlashtirilgan xavfga javob tizimlari kiberhujumlarning oldini olishda muhim rol o‘ynaydi.

Shuningdek, maqolada kiberhujumlar oqibatidagi moddiy yo‘qotishlar tahlil qilinib, korxona va tashkilotlar uchun xavfsizlikka investitsiya kiritish zarurligi asoslab berildi. O‘tkazilgan tahlillar natijasida xavfsizlikka proaktiv yondashuv, foydalanuvchilarni doimiy o‘qitish, axborot xavfsizligi siyosatlarini joriy qilish va yangilab borish bugungi kunda eng muhim choralar ekani aniqlandi.

Xulosa qilib aytganda, raqamli xavflarning oldini olish uchun kompleks yondashuv – texnologik himoya vositalari, inson omilini inobatga oluvchi strategiyalar va xalqaro xavfsizlik standartlariga asoslangan yondashuv zarur. Mazkur maqolada taqdim etilgan tavsiyalar amaliyotda qo‘llanilsa, kiberxavfsizlik darajasini sezilarli darajada oshirish mumkin.

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MORPHOLOGICAL FOUNDATIONS OF FORMAL RELATIONS BETWEEN WORDS: AFFIXATION AND WORD FORMATION MODELS

Abstract: *Morphology provides the basis for understanding the internal structure of words and their formal relationships within a language. Through processes such as affixation and various word formation models, new words are created and organized into structured lexical systems. This article explores the key morphological mechanisms that shape the relationships between words, focusing on how affixation and word formation manifest in the German language. Examples from German illustrate the systematicity and productivity of these morphological processes.*

Keywords*: Morphology, Affixation, Word Formation, German Language, Compounding, Derivation, Inflection, Lexical Families, Linguistic Structure.*

Introduction. Morphology, as a branch of linguistics, is concerned with the study of word structure and formation. It examines how morphemes—the smallest units of meaning—combine to form words and how those words relate to each other within the language system. One of the most essential aspects of morphology is the formation of formal relations between words, such as those found in derivational families. These relationships are established through regular and predictable morphological processes, especially affixation and structured word formation patterns.

It investigates how **morphemes**—the smallest meaningful linguistic units—combine to create complex word forms and how these forms function within a given linguistic system.

One of the central objectives of morphological analysis is to elucidate the **formal relationships between words**, particularly within **derivational word families**, where words share a common root and are systematically related through affixation or other morphological operations. These relations are not random but rather follow **predictable and rule-governed patterns**, which can be generalized across a wide array of lexical items.

A key mechanism underlying such formal relationships is **affixation**, encompassing the addition of prefixes, suffixes, infixes, and circumfixes to base forms. Through affixation, new words can be derived from existing ones, frequently involving a shift in grammatical category (e.g., from noun to adjective) or a modification in semantic content. For instance, in English, the noun *nation* can yield *national*, *nationalize*, and *international*, all of which are morphologically and semantically connected to the original root.

In addition to affixation, **structured word formation models**—such as compounding, conversion, and reduplication—play a significant role in expanding the lexicon and reinforcing semantic networks within a language. These models enable speakers to generate new lexical items that conform to the morphological norms of their language, thereby ensuring both **productivity** and **regularity** in word formation processes.

Understanding the morphological foundations of word formation is essential not only for theoretical linguistics but also for applied domains such as language acquisition, lexicography, computational linguistics, and foreign language pedagogy. The study of morphological structures reveals how languages economize and systematize meaning, linking seemingly diverse lexical items through coherent morphological paradigms. German, with its rich morphological system, provides a valuable perspective on how affixation and compounding contribute to the formal cohesion of the lexicon.

Affixation refers to the attachment of prefixes, suffixes, or infixes to a word base to form new words or grammatical forms. German is highly productive in both **derivational** and **inflectional** affixation. Affixation is a core morphological mechanism that entails the attachment of bound morphemes—commonly known as **prefixes**, **suffixes**, **infixes**, or **circumfixes**—to a base or root in order to form new lexical items or to express grammatical relationships. This process is foundational in both the **derivational** and **inflectional** subsystems of morphology.

In the context of derivation, affixation facilitates **lexical expansion** by generating new words, often altering the grammatical category or meaning of the base form. For example, in German, the addition of the prefix *ver-* to the verb *kaufen* (to buy) yields *verkaufen* (to sell), demonstrating both a semantic shift and a productive pattern of verb formation. In the domain of inflection, affixation serves to **encode grammatical features** such as tense, mood, number, case, gender, and person without significantly altering the core lexical meaning. German, with its rich inflectional morphology, illustrates this through examples like *Haus* → *Häuser* (house → houses) and *gehen* → *ging* (go → went), where suffixal changes indicate pluralization and tense, respectively.

German, as a morphologically rich language, exhibits **high productivity** in both derivational and inflectional affixation. Its systematic use of affixes enables the generation of complex and semantically nuanced words, contributing to the language's expressive capacity and structural coherence. The regularity and predictability of these affixational patterns not only enhance communicative efficiency but also provide a framework for linguistic analysis and language learning.

Derivational affixes create new words, often changing the word class or meaning. Examples include:

Prefixation:

- *lesen* → *vorlesen* (to read → to read aloud)
- *kaufen* → *verkaufen* (to buy → to sell)

Suffixation:

- *freundlich* → *Freundlichkeit* (friendly → friendliness)
- *fahren* → *Fahrer* (to drive → driver)

Inflectional affixes indicate grammatical features such as tense, number, person, or case. Examples include:

- *gehen* → *ging*, *gegangen* (go → went, gone)
- *Haus* → *Häuser* (house → houses)
- *der Mann* → *des Mannes* (nominative → genitive)

These affixes maintain the core meaning of the base word but adapt it to grammatical contexts.

Conclusion. Affixation and word formation are fundamental to the morphological system of German. These processes not only expand the lexicon but also establish formal, semantic, and syntactic relationships between words. Examining how these mechanisms function in German offers insights into the structural richness of the language and its capacity for precise and creative expression.

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ECONOMIC GROWTH MODELS, THEIR COMPARATIVE ANALYSIS AND FOREIGN PRACTICE

Abstract: *This article describes and compares various models related to macroeconomic equilibrium and economic growth based on various graphs, formulas and tables. In addition, the specific characteristics of the models and their application, in which period and for which economic systems, are covered in detail.*

Key words*: economic growth, capital, labor, commodity market (IS), money market (LM), balance of payments (BP), interest rate, return on capital, technology, capital accumulation, level of accumulation.*

1.Introduction

Throughout the history of economics, from the transition from natural economy to modern market economy, various economic theories have emerged that were specific to each period. These economic ideas were influential at the time they were developed, but as economic management structures changed, new theories took their place. Alongside overarching economic theories, individual economists have also put forth their own ideas on economic growth, which have evolved over time and varied significantly in their focus and components.This article delves into the diverse definitions of economic growth proposed by different researchers, addresses key questions regarding the sources of economic growth, examines various models related to economic growth and their constituent elements, and explores reasons for disparities in economic performance among countries. By exploring these topics in detail, readers will gain a comprehensive understanding of the complexities surrounding economic growth and activity across different contexts. The exploration of questions pertaining to economic theories is crucial not just for understanding the intricacies of the economy, but also for conducting in-depth analysis in the fields of macroeconomics and social science. This article delves into the distinct characteristics and disparities among various economic models such as the Harrod-Domar model, the Robert Solow economic growth model, the IS-LM-BP model, and the AD-AS model, all of which are fundamental in shaping economic policies and predicting market behaviors. Furthermore, it examines the innovative economic growth perspectives put forth by contemporary economist Daron Acemoglu, shedding light on his contributions to modern economic thought.

2. Analysis of literature on the topic

Numerous researchers have explored the concept of economic growth. However, in this article, we will delve into the prominent and all-encompassing theories of economic growth and stability.

According to prominent Uzbek economists, such as Dzhumaev, the concept of economic growth refers to a sustained and gradual expansion in the capacity for production that aligns with conditions of full employment. In essence, economic growth signifies a rise in overall supply, encompassing both real and potential Gross Domestic Product (GDP). This trajectory denotes a continuous enhancement in the economy's ability to generate goods and services over an extended period, ultimately contributing to broader prosperity and development.

Let's talk about the Harrod-Domar growth model. This model is the result of independent research of British economist Roy Harrod and American economist Evsey Domer. According to this model, economic growth depends on three factors: capital (K), labor (L), resources (R)

$$\mathbf{Y= F (K , L, R)}$$

In this case, R and L are considered as factors that lead to growth in capital production [2].

The Solow-Swan model, commonly referred to as the Solow model in academic literature, was introduced by economists Robert Solow and Trevor Swan in 1956 through a comprehensive paper 3. Subsequently, Bob Solow further refined the model and explored its potential applications, ultimately earning the Nobel Prize for his groundbreaking contributions to economics. The Solow model has not only revolutionized our understanding of economic growth, but has also significantly influenced our approach to various aspects of macroeconomics. Its enduring impact on the field continues to shape economic theory and policy discussions to this day.

Arthur Lewis, another prominent economist, proposed a model in which he emphasized that the labor force reserve serves as the foundation for economic growth. According to Lewis, this model is particularly applicable to countries characterized by high population density, limited natural resources, and a scarcity of capital. Examples of such nations include India, Pakistan, and Egypt. Lewis's model suggests that in these contexts, the availability of a surplus labor force can drive economic development and expansion, as it can be harnessed to boost production and contribute to overall economic growth.

Professor Acemoglu's seminal contribution to the field of development economics lies in his groundbreaking theory known as "Why Nations Fail." In this theory, he emphasizes the pivotal role of political institutions in shaping the economic outcomes of nations. Acemoglu distinguishes between two fundamental types of institutions: extractive and inclusive. Extractive institutions are characterized by their tendency to benefit a small elite or privileged few, often at the expense of the broader population. This can be seen historically in systems such as feudalism, where power and resources were concentrated in the hands of nobles. In contrast, inclusive institutions are designed to empower and represent the interests of the majority, with a focus on promoting overall societal well-being. By highlighting the importance of inclusive institutions in driving economic development and prosperity, Acemoglu's work underscores the critical link between politics and economics in shaping the trajectory of nations.

3. Research methodology

In the article, the theories of economic growth are compared and illustrated with the help of graphs, based on a systematic approach, statistics, comparison, scientific abstraction, and the study of existing domestic and foreign literature and articles related to economic growth.

4. Analysis and results

Economic growth is influenced by the production function and is a dynamic process that involves changes in gross output, capital, consumption, and population. To understand this dynamic process, it is important to study dynamic models. The Solow model, known as the general dynamic equilibrium model, aims to promote long-term economic growth. This model provides insights into how various factors interact to drive economic development over time.

The Harrod-Domar model is designed for the economies of developed countries and focuses on achieving stable growth rates. In this model, economic growth is driven by the levels of savings and capital production. The more savings that are accumulated, the greater the efficiency of capital and the overall economic growth. Savings and investment are directly related, as investments lead to the creation of capital. Therefore, in the Harrod-Domar model, the emphasis is placed on building up a fund for investment. This model can be better understood through the diagram provided below.

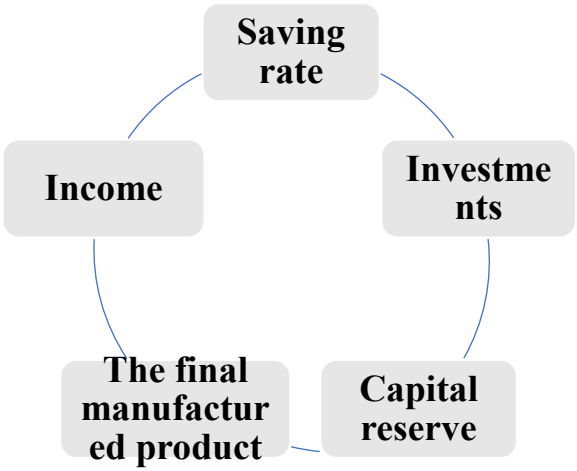


Diagram 1: Circular diagram of the Harrod-Domar economic growth model [8].

In underdeveloped and low-accumulation countries, where the level of accumulation is low, there is a corresponding low level of investment. This leads to a very limited capital stock and ultimately results in an unsatisfactory final output of GDP due to the inadequate rate of capital. Consequently, the overall income levels in these countries remain low. Therefore, the model discussed may not be suitable for economies that are characterized by underdevelopment and low levels of accumulation.

Conversely, in countries where the level of accumulation is high, there is a natural increase in the volume of investments as well as the volume of capital stock. This heightened level of capital leads to a greater volume of final production and subsequently an increase in income levels within the economy. As a result, economies with high levels of accumulation tend to experience higher rates of economic growth and prosperity compared to those with lower levels of accumulation.

Problems with the Harrod-Domar model:

✓ The level of accumulation is different;

✓ Financial system, for example, inefficiency of banks;

✓ Increase in external debt creates problem of repayment, and there is a break in the above process.

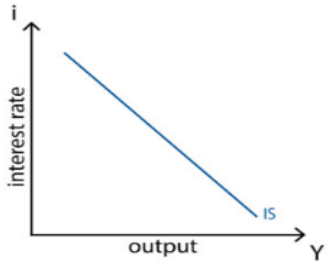
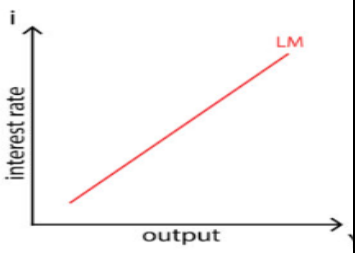
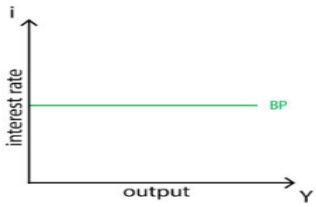
Table 1
Comparison chart of Solow and Harrod-Domar models

Harrod – Domar model	Solow model
A drop in aggregate demand (AD) for goods is known to constrain economic growth.	Reduced capital returns limit economic growth;
A change in the savings rate has a lasting impact on the growth rate of GDP per capita.	A change in the savings rate has a temporary effect on the growth rate of GDP per capita.

Source: Compiled on the basis of the author's scientific developments, 2024.

A different perspective on economic equilibrium can be observed through the IS-LM-BP model, which encompasses the interactions between investments and savings, the liquidity of money, and the balance of payments. Initially developed by economists Robert Mundell and Marcus Fleming, this model seeks to establish a balance between the goods and money markets as well as external trade through a comprehensive analysis of the IS, LM, and BP curves. The IS curve represents the equilibrium in the goods market by showing all combinations of interest rates and output levels where total spending equals total output. The LM curve reflects the equilibrium in the money market by illustrating all combinations of interest rates and income levels where money supply equals money demand. Finally, the BP curve outlines the equilibrium in the balance of payments by depicting all combinations of exchange rates and output levels where inflows equal outflows in a country's international trade.

Table 2
IS-LM-BP functions [9]

IS	LM	BP
A high interest rate in the commodity market leads to a decrease in income (Y). 	In the money market, the interest rate and the rate of return are directly proportional. 	The BP curve shows at what point in the interest rate the balance of payments reaches equilibrium. 

Another general equilibrium model is the AD-AS model. This model is also called the basic macroeconomic scenario. In this model, it is reflected that at the equilibrium price, the aggregate demand and aggregate supply in the country are equal.

In addition, there are several developed foreign countries that have employed different economic growth models to drive their economies. Some of the prominent ones include:

1. The United States: The U.S. has a mixed economy, characterized by both capitalist and socialist elements. The country relies heavily on consumer spending, technological innovation, and entrepreneurship to drive economic growth.

2. Germany: Germany's economic growth model is based on a strong industrial base, export-oriented manufacturing sector, and emphasis on high-quality products and services. The country also places a strong emphasis on vocational training and workforce development.

3. Japan: Japan's economic growth model focuses on innovation, technology, and exporting high-tech products. The country has a strong focus on research and development, as well as collaboration between government, industry, and academia.

4. South Korea: South Korea's economic growth model is based on export-led industrialization and investment in technology-intensive industries such as electronics, automotive, and shipbuilding. The country also places a strong emphasis on education and skills development.

5. Sweden: Sweden's economic growth model is based on a combination of social welfare policies, innovation-driven economy, and sustainable development

practices. The country has a strong focus on research and development in sectors such as healthcare, renewable energy, and information technology.

5. Conclusions and suggestions. In conclusion, analyzing economic growth and creating models aimed at ensuring it is a very complex process. Each of the models of economic equilibrium and growth presented in this article has different characteristics.

In the Harrod-Domar model, economic growth is primarily seen in developed countries and it is evident that increasing savings leads to economic growth by attracting investments in the form of capital.

On the other hand, the Solow model emphasizes that technological advancements

play a crucial role in driving growth. This model is considered exogenous, focusing on how changes in population growth, accumulation levels, and technological progress impact overall production volume over a specific period.

Our suggestions for this article include the following. The need to study the comparison of various researches and models carried out by the world and local scientists on the issue of economic growth, which has a key place among economic issues, and to include them in the literature of the family education system is the current economic growth about the issue will bring comprehensive benefits to students and researchers.

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PROTECTION OF WORKING BLADES OF AXIAL SMOKE SUPPERS FROM GAS ABRASIVE WEARING

Annotation: *This article presents the results of research and theoretical information on the use of axial vacuum cleaners DOD-41-500 in dust-coal boilers of power units with a capacity of more than 300 MW, their restoration, the effectiveness of restoration methods, wear rates, combined restoration technologies, the most wear-resistant materials, quality control.*

Keywords: *smoke exhaust, abrasive wear, erosion, gas abrasive wear, surfacing.*

Energy units of the CIS countries, using coal as fuel", are equipped with DOD 41-500smoke collectors for flaring exhaust gases'. Power 300 MW'The use of dust collectors of power units -co'in DOD-31.5 and DOD-41 o'smoke collectors'of steel boilers is usually accompanied by intensive abrasive wear of the blade apparatus (Fig. 1-).

The technical characteristics of the DOD 41-500 smoke extractor are presented in Table 1.

Table 1
DOD 41-500 Smoke Extractor Technical Specifications

Pointer name	Value
Diameter of the impeller, m	4.1.
Engine (synchronous) rotation frequency, max, rpm	500
Installed engine power, kW	5,000
Sucking capacity, m^3 /hour	1445000
Permissible Moving Medium Temperature, °C	200.
Permissible dust content of the mobile medium, g/nm^3	0.5
Mass of the impeller in the first and second stages, kg	5500

Yo'blades of the guide apparatus, consisting of replaceable nose parts and rotary covers, are also prone to dust wear, but their service life is 2 - 2.5 times greater

than the service life of the working bladesko'p. Armor 'compared to other elements of the flow part of the smokestack (8-10po'lat sheets) serves the longest. At the same time,,armor'is most intensively worn (up to 3-4 mm per year) under the covers of the shovels.

Due to the wear of the working blades, a decrease in the supply of the exhaust fan leads to the need to accelerate its operation. This is achieved by rotating the blades of the guiding apparatuses to -30°, which significantly increases the vibrational stresses and contributes to the formation of fatigue cracks, which in some cases leads to the breakage of the working blades. In this regard, research work was carried out at the "Yangi Angren TPP" to increase the wear resistance of DOD-41 axial exhaust fans. The study of block operation showed the following. With unlimited block power, the wear of the working blades of the exhaust fan is approximately 60 mm (about 10%). When the chord decreases by 20%, the power of the block decreases by 5-7% due to insufficient traction force. With a gas dust content of 1.2 g/m3, unprotected working blades wear 60 mm along the chord after 800-1200 hours of operation. The main direction of increasing the resource of fume hoods, in addition to increasing the efficiency of flue gas cleaning, is the use of various methods of blade reinforcement.

Before starting the work on reinforcing the blades, the natural vibration frequency of the blades was measured, and the root zone of the working blades' inlet edge was checked for the presence of fatigue cracks. With a crack depth of up to 1.0 mm, they were selected with abrasive tools. After sampling, they were welded to a greater depth using UONI 13/55 electrodes. In deeply developed cracks, the scapula is incised.

To determine the most wear-resistant material, T-590 electrodes were tested with coatings in the form of plates made of KBX-45, chromium boride granules, PP-AN170 powder wire, VK-6 hard alloys, "sormaite," as well as T15K6 hard alloy and TiNi titanium nickelide, and coatings coated with plasma and gas-powder coatings with self-fluxing alloys. The thickness of the deposited layer after cleaning was not less than 4-5 mm at the tip of the blade and 3 mm at the outlet edge (Fig. 2). The hardness of the surfaced layer was measured according to the control surfacing sample and was at least 58 - 61 HRC.

Practice has shown that the wear of the inlet edge has the greatest impact on the overall wear of the blade. By protecting the inlet edge from wear, it is possible to reduce the wear of the working blade's outlet surface.

The wear of the blades increases sharply from the moment a wedge is formed at the entrance edge at an angle of 60°. Along the entire height of the edge, such a wedge is usually formed after 400-600 hours of operation of the unprotected working blade. The rectangular shape of the blade tip increases the wedge formation time by 30-40%, thereby extending the service life of the blades. Taking this into account, during surfacing and cleaning, the tip of the blade was given a rectangular shape.

Quality control of surfacing was carried out visually. Sections, unwelded areas, large slag inclusions, and cracks reaching the base metal along the entire

thickness of the deposited metal were not allowed. The part at the outlet edge, coated on the working surface, is protected in such a way as to ensure a smooth transition from the base metal to the coated metal along the gas flow direction. Otherwise, during operation, the metal of the blade under the surfacing will wear out, forming a "pocket."

Experiments with protective surfacing of the blades of DOD-41-500 exhaust fans with individual electrodes and plasma spraying along the entire height of the inlet edge showed that fatigue cracks are formed in a zone 100 mm wide from the blade root. In one fume hood, the number of cracked blades reached up to 30%.

In this zone (maximum stress zone), electric arc surfacing of the working blade inlet edge with wear-resistant electrodes and powdered wires leads to a decrease in the fatigue strength of the metal. During surfacing, the base metal heats up to a temperature above 1500°C. In this case, grain growth occurs in the boundary zone, which reduces the plasticity of the metal. Alloying the base metal of the blade with molten coated metal increases strength and breaks the crystal lattice of the base metal, which also reduces the fatigue strength of the blade metal. Compressive stresses in the surfaced metal reach high values. Under the influence of alternating sign loads, destruction (vibration) occurs mainly in the more brittle surfaced metal, and the resulting crack spreads to the base metal. In this case, the natural frequency of the blade's oscillations decreases, which contributes to its entry into the hazardous zone of the resonant frequency.

It should be noted that the part of the blade's inlet edge at a distance of 100 mm from the base is in a highly stressed state during operation, therefore, strict requirements are imposed on the protective coating: the heating and melting of the base metal should be minimal, there should be no cracks in the deposited metal, the wear resistance of the coating should be sufficiently high, i.e., 3-4 times higher than the wear resistance of the blade. The surfaced metal must withstand alternating sign loads acting on the tip of the blade in this zone. All these requirements correspond to argon-arc surfacing with alternating layers of hard alloy VK-6 and steel grade 12X18N10T (Fig. 2, c). For effective protection of the root zone of the working blades, the design of the protective cutter, shown in Fig. 3, was developed. The incisor protects the pre-root area of the scapula for at least one year.

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Installation of new cutters is carried out by a team of two people for 1-1.5 hours. The experience of their use in DOD-41-500 axial exhaust fans has shown the effectiveness and reliability of such separators. Cutters are installed with argon arc surfacing of the root zone (which increases the effectiveness of protection) and without surfacing it. The nature of wear of the working blades with a protective coating of the DOD-41-500 axial fume hoods installed in the boiler.

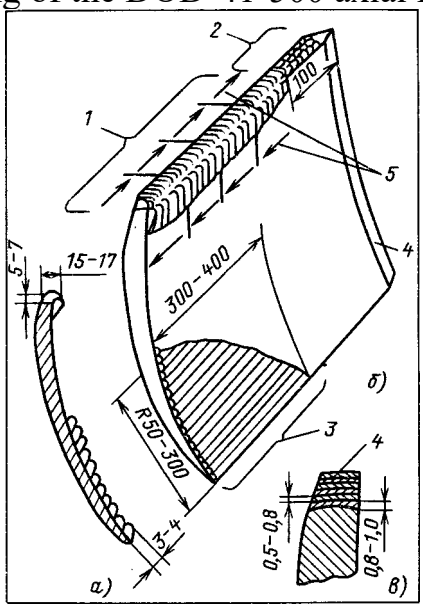

Figure 2. Diagram of combined surfacing of the working blade of an axial exhaust fan (before welding to the wheel):

a - cross-section of the blade with directed inlet and outlet edges; b - working blade; c - cross-section of the blade inlet edge in the argon-arc surfacing zone; 1 - zone of surfacing with KBX, PP-AN170 electrodes; 2 - zone of argon-arc surfacing; 3 - zone of semi-automatic surfacing with PP-AN170 electrodes; 4 - alternating layers of hard alloy VK-6 and steel 12X18N10T

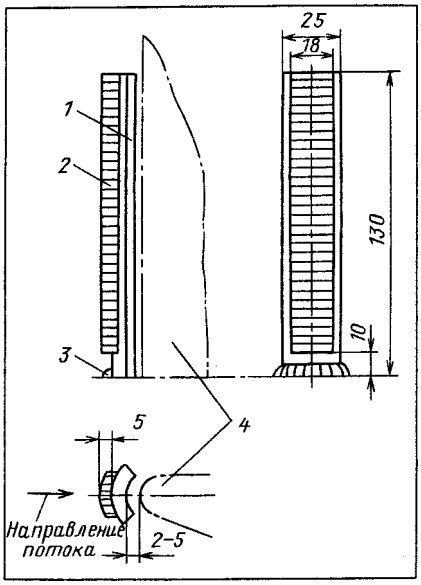

Figure 3. Diagram of the protective cutter and its installation in front of the working blade:

1 - cutter (part of the pipe with a diameter of 32x6 mm); 2 - wear-resistant surfacing; 3 - welding joint of the cutter; 4 - working blade;

1 - new blade; 2 - after 700 hours; 3 - after 2000 hours; 4 - after 4800 hours; after 5 - 5500 hours

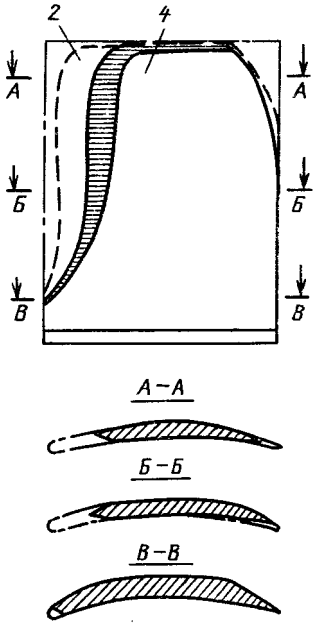

Figure 1. Change in the contour of the working blades of the DOD-41-500 axial smoke extractor of coal dust boilers during operation:

The power unit (with residual dust content of flue gases from 2 to 15 g/m3) is shown in Fig. 4.

In addition to the known surfacing materials, non-tungsten surfacing materials were developed and tested to protect the tip of the working blade in the DOD-41 smoke extractor: tubular electrodes filled with SgV2 granules with a stabilizing coating and additional rods in the form of steel pipes filled with SgV2 granules (Fig. 5). Tests were conducted by comparing hard alloy coatings (additional material) with VK-6 and KBX-45 electrodes. Sections with a length of 150 mm from the end of the inlet edge were deposited on eight working blades.

The results of industrial tests of surfacing for 2100 hours are presented in the table. It was established that surfacing materials based on granulated chromium boride are technologically efficient under repair conditions, and the surfaced layers with them are more wear-resistant compared to other surfacing materials.

This is explained by the following. In gaseous wear (with ash particle sizes from 3 to 80 μm), the structure of the welded bonding metal is of great importance. If the hardness of the binder metal is not less than the hardness of ash particles, the surfaced metal exhibits good resistance to gas-abrasive wear.

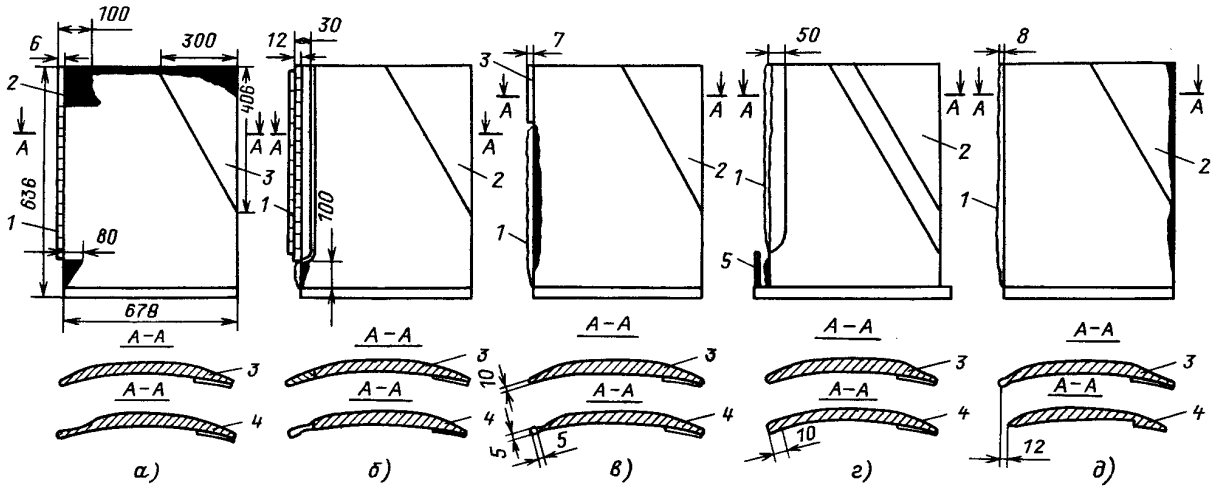

Figure 5. Wear of the working blades of the DOD-41 smoke extractor with a protective coating:

a - soldering and surfacing of plates; 1 - T5KYU hard alloy plates; 2 - surfacing with "sormaite" alloy and T-590 electrodes;

b - soldering and surfacing of plates: 1 - T5KYU hard alloy plates; 2 - surfacing with T-590 electrodes; 3 - initial profile; 4 - profile after 9970 hours of operation

v - surfacing with electrodes and soldering of plates: 1, 2 - surfacing with PP-AN170 and T-590 electrodes; 3 - welding of TiNi alloy plates; 4 - profile after 4500 hours of operation

g - electrode surfacing: 1 - PP-AN170 electrodes; 2 - carbon electrodes; 3 - initial profile; Profile after 4 - 10,000 hours of service

d - surfacing: 1 - with tubules with CBC; 2 - T-590 electrodes; 3 - initial profile; Profile after 4 - 10,000 hours of service

Surfacing material	Methods and mode of surfacing	Source	Hardness of surfaced material, HRC	Thickness of the deposited layer, mm	Working blade width, mm	
					Before trial	After 2100 hours of work
Pipe electrodes with a stabilizing coating 8 mm diameter'	Electric arc, 120 A	current	71.	3 - 4	580.	580.
Steel tubes filled with SgV2 granules with a diameter of 6 mm	Argon-arc, 80A	current	73.	3.	578.	576.
VK-6 hard alloy rod with a cross-section of 5x5 mm	Argon-arc, 120A	current	61.	2.5	578.	570.
Granular KBX-45 electrodes with a diameter of 5 mm	Electric arc, 120 A	current	58.	3 - 4	580.	530

Otherwise, during the intensive wear of the binder metal, the hardest particles of borides and carbides will crumble.

Of the currently produced surfacing materials, the powder wire grade PP-AN170 is the most effective. The least effective protection is surfacing with T-590 and T-620 electrodes.

Plasma spraying with self-fluidizing alloys is effective only when the exhaust gases are low in dust (close to sanitary standards).

Hard alloy plates of the Pobedit type are practically wear-resistant, but the technology of their fastening, especially the closure of joints between the plates, creates significant difficulties.

Protection of the inlet edges by surfacing with materials from PP-AN 170 and KBX, if it corresponds to the scheme shown in Fig. 2, is most effective with the mandatory installation of protective cutters.

The main factor ensuring the reliability of the operation of working blades is the quality of their manufacture according to factory drawings and compliance with the welding technology. Numerous cases of cracks appearing on the working blades of axial smokestacks during operation indicate the need for input control of the quality of preparation and welding of the working blades, as well as periodic monitoring of the condition of their near-root zone during operation for the presence of fatigue cracks.

When repairing the flow part of the exhaust fan, the nose parts of the guide blades are restored by surfacing with welding electrodes, and then by surfacing with T-590 and T-620 electrodes. The covers of the lower guide blades wear out faster than the upper ones. Their positions are swapped. Worn-out parts of the armor are being replaced. [3]

In conclusion, it should be noted that the protection of working blades from wear is an important measure, saving material, time, and labor costs.

To manufacture new working blades for the DOD-41-500 exhaust fan, 4 tons of metal are required to replace the worn blades, and 300 kg of electrodes are needed to weld the blades to the wheels. Labor costs in this case are approximately 400 man-hours. Rotor replacement takes from 3 to 7 days.

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INNOVATSION TA’LIM TEXNOLOGIYALARI ORQALI IJTIMOIY ONGNI SHAKLLANTIRISH: NAZARIYA VA AMALIYOT

Annotatsiya: *Bugungi kunda ta’lim jarayonida innovatsion texnologiyalardan foydalanish nafaqat bilim berish sifatini oshirish, balki o‘quvchilarda ijtimoiy ongni shakllantirishda ham muhim vosita sifatida qaralmoqda. Ushbu maqolada ijtimoiy ong tushunchasining pedagogik mazmuni, uning rivojlanish bosqichlari hamda zamonaviy ta’lim texnologiyalarining bu jarayondagi o‘rni tahlil qilinadi. Muallif zamonaviy o‘quvchilarda tanqidiy fikrlash, mas’uliyat, hamkorlik va jamiyatga daxldorlik hissini rivojlantirishda raqamli platformalar, interaktiv metodlar, virtual muhitlar va media texnologiyalarning ta’sirini ko‘rsatadi. Shuningdek, maqolada nazariy yondashuvlar bilan birga, amaliy tajribalarga ham tayanilgan bo‘lib, innovatsion texnologiyalarning ijtimoiy ongga ta’siri misollar orqali yoritilgan. Tadqiqot natijalari ushbu yo‘nalishda olib borilayotgan pedagogik faoliyatni yanada takomillashtirish, shuningdek, ta’lim orqali ongli jamiyatni shakllantirish imkonini ochib beradi.*

Kalit so‘zlar*: innovatsion texnologiyalar, ta’lim jarayoni, ijtimoiy ong, pedagogika, tanqidiy fikrlash, media savodxonlik, raqamli platformalar, virtual muhit, interaktiv metodlar, ijtimoiy mas’uliyat, ongli jamiyat, axborot texnologiyalari, zamonaviy ta’lim, kompetensiya, ta’lim strategiyalari.*

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FORMATION OF SOCIAL CONSCIOUSNESS THROUGH INNOVATIVE EDUCATIONAL TECHNOLOGIES: THEORY AND PRACTICE

Abstract: *Today, the use of innovative technologies in the educational process is regarded not only as a means of improving the quality of instruction but also as an important tool for shaping students’ social consciousness. This article analyzes the pedagogical meaning of the concept of social consciousness, its developmental stages, and the role of modern educational technologies in this process. The author highlights the impact of digital platforms, interactive methods, virtual environments, and media technologies on fostering critical thinking, responsibility, collaboration, and a sense of social belonging in today’s students. The article is*

based not only on theoretical approaches but also on practical experiences, illustrating the influence of innovative technologies on social consciousness through concrete examples. The results of the study open up opportunities to further improve pedagogical efforts in this area and contribute to the formation of a conscious society through education.

Keywords: *innovative technologies, educational process, social consciousness, pedagogy, critical thinking, media literacy, digital platforms, virtual environment, interactive methods, social responsibility, conscious society, information technologies, modern education, competence, educational strategies.*

Kirish

XXI asrda jamiyat taraqqiyotining asosiy omili sifatida inson kapitalini rivojlantirish dolzarb masalaga aylangan. Bu jarayonda ta’lim tizimining roli beqiyosdir. Zero, zamonaviy ta’lim nafaqat bilim va ko‘nikma berish, balki ijtimoiy ongni shakllantirish, fuqarolik pozitsiyasini mustahkamlash, axborotga tanqidiy yondashuv, mas’uliyatli qaror qabul qilish kabi ijtimoiy-ma’naviy ko‘nikmalarni singdirish vazifasini ham bajaradi. Bu esa ta’limga yangicha yondashuv, ya’ni innovatsion texnologiyalarni joriy etishni talab qiladi. Aynan shu nuqtai nazardan qaralganda, innovatsion texnologiyalarning imkoniyatlari ijtimoiy ongni shakllantirish vositasi sifatida alohida ahamiyat kasb etadi.

Innovatsion ta’lim texnologiyalari deganda faqat zamonaviy qurilmalar yoki raqamli platformalarni emas, balki pedagogik jarayonni interaktiv, shaxsga yo‘naltirilgan, ijodiy va mustaqil fikrlashga undovchi metodlar majmuasini tushunamiz. Masalan, raqamli resurslar, virtual laboratoriyalar, media kontent, axborot-kommunikatsiya vositalari o‘quvchilarning bilim olish jarayonini individuallashtirish, ularni ijtimoiy muhitdagi voqea-hodisalarga nisbatan faol pozitsiyada bo‘lishga undashga xizmat qiladi. Shuningdek, bu texnologiyalar orqali o‘quvchilar orasida hamkorlik, empatiya, ijtimoiy mas’uliyat, ochiq muloqot kabi ijtimoiy ko‘nikmalarni shakllantirish mumkin.

Maqolada innovatsion texnologiyalarning ijtimoiy ong shakllanishidagi o‘rni ilmiy-nazariy asosda yoritiladi. Shuningdek, amaliy tajribalar, xalqaro tajribalar va milliy ta’lim tizimidagi yechimlar orqali ularning samaradorligi tahlil qilinadi. Tadqiqot natijalari orqali pedagogik faoliyatda innovatsion yondashuvlarni joriy qilish bo‘yicha taklif va tavsiyalar shakllantiriladi.

Adabiyotlar tahlili va metodologiya

Innovatsion pedagogik texnologiyalar orqali ijtimoiy ongni shakllantirish bugungi ta’lim tizimining ustuvor yo‘nalishlaridan biridir. Bu masala bo‘yicha olib borilgan ilmiy adabiyotlar tahlili shuni ko‘rsatadiki, zamonaviy texnologiyalar nafaqat bilim berish jarayonini takomillashtirish, balki o‘quvchilarda ijtimoiy tafakkur, mas’uliyat, hamkorlik va faol fuqarolik ongini shakllantirishda ham samarali vosita sifatida namoyon bo‘lmoqda.

O‘zbekistonlik tadqiqotchilarning fikriga ko‘ra, raqamli texnologiyalar va interaktiv vositalar o‘quvchilar shaxsini har tomonlama rivojlantirishda, ularning ijtimoiy faoliyatga tayyorligini oshirishda muhim ahamiyat kasb etadi. Masalan,

Farg‘ona davlat universiteti professori Bahodirjon Shermuhammadov va ilmiy xodim Odiljon Raxmatov o‘zlarining maqolasida raqamli ta’lim muhitining o‘qituvchilar va o‘quvchilar axborot madaniyatini shakllantirishdagi roliga e’tibor qaratadilar. Ular ta’limda texnologik vositalardan maqsadli foydalanish o‘quvchilarning ijtimoiy bilim darajasi va ongini mustahkamlashini ta’kidlaydilar[1].

Shuningdek, Farg‘ona universiteti dotsenti Mo‘llayev Baxtiyor Mashrabovich tomonidan ilgari surilgan qarashlarda shaxsga yo‘naltirilgan ta’lim metodlarining o‘quvchi shaxsini mustahkamlashda, ularning o‘z fikrini ifoda etish va ijtimoiy jarayonlarga faol kirishishida muhim omil ekani ko‘rsatilgan[2].

Farg‘ona Davlat Universiteti doktorantlari Axmedov Akmaljon va Sherqo‘ziyeva Zarnigor esa interaktiv texnologiyalar, virtual sinflar va raqamli vositalar o‘quvchilarda ijtimoiy mas’uliyat va mustaqil qaror qabul qilish ko‘nikmalarini rivojlantirishini empirik asosda isbotlashgan[3].

Xalqaro tajribalarda ham bu boradagi izlanishlar kengaymoqda. Mohammad Awedh rahbarligidagi tadqiqotchilar Socrative platformasidan foydalanish orqali o‘quvchilarning sinfdagi faolligini va hamkorlik darajasini oshirishga erishgan. Statistik natijalar shuni ko‘rsatdiki, innovatsion texnologiyalar o‘quvchini passiv ishtirokchidan faol ijtimoiy subyektga aylantiradi[6].

Amerikalik professor Cindy Hmelo-Silver kompyuter yordamidagi hamkorlikli o‘qitish (CSCL) orqali o‘quvchilarning ijtimoiy ongini rivojlantirishni asoslagan. U ta’lim jarayonida o‘zaro fikr almashish, muloqot va vazifa bo‘yicha taqsimlangan faoliyat ijtimoiy ko‘nikmalarni faollashtiradi, deb hisoblaydi[4].

Singapurlik pedagog Joyce Koh esa o‘qituvchilarning texnologik, pedagogik va fan bo‘yicha bilimlarini uyg‘unlashtirish orqali ta’lim samaradorligini oshirishni nazarda tutuvchi TPACK modelini ishlab chiqqan. Ushbu model yordamida o‘qituvchi zamonaviy texnologiyalarni ijtimoiy ongni shakllantirish yo‘lida strategik vosita sifatida qo‘llay oladi[5].

Mazkur maqola metodologiyasi quyidagi tamoyillarga asoslangan:

1. Nazariy tahlil – Mahalliy va xorijiy olimlarning ilmiy qarashlari asosida innovatsion texnologiyalarning ijtimoiy ongga ta’siri nazariy jihatdan o‘rganiladi.
2. Empirik yondashuv – Awedh va O‘zbekistonlik doktorantlarning tajribalari asosida, real ta’lim muhitida olib borilgan amaliy tadqiqotlar tahlil qilinadi.
3. Modellashtirish – TPACK modeliga tayanib, innovatsion texnologiyalarni pedagogik jarayonga integratsiya qilish uchun ilmiy asos ishlab chiqiladi.
4. Kollaborativ o‘rganish asoslari – Hmelo-Silver taqdim etgan CSCL tamoyillari asosida o‘quvchilarning ijtimoiy muloqotini kuchaytirish metodikasi aniqlanadi.

Ushbu metodologik yondashuv mavzuni kompleks yoritishga, ilmiy asoslashga va amaliy yechimlar taklif qilishga xizmat qiladi[7, 8, 9, 10].

Natijalar

O‘tkazilgan adabiy tahlil va metodologik izlanishlar natijasida innovatsion ta’lim texnologiyalarining o‘quvchilarda ijtimoiy ongni shakllantirishdagi roli quyidagi asosiy jihatlar orqali namoyon bo‘ldi:

Birinchidan, raqamli vositalar va virtual ta’lim muhitlari o‘quvchilarning mustaqil fikrlashi, shaxsiy qaror qabul qilishi hamda tanqidiy yondashuvni rivojlantirishga xizmat qilmoqda. Farg‘ona davlat universiteti olimlari — B. Shermuhammadov va O. Raxmatovlarning ta’lim muhitidagi raqamli vositalar orqali informatsion madaniyatni shakllantirish haqidagi fikrlari bu xulosani mustahkamladi. Ular axborotni tanqidiy tahlil qilish, fikr bildirish va ijtimoiy munosabatlarga ongli yondashish kabi ko‘nikmalar raqamli ta’lim orqali samarali rivojlanishini ta’kidlaydilar.

Ikkinchidan, interaktiv va shaxsga yo‘naltirilgan metodlarning qo‘llanilishi orqali o‘quvchilar o‘z ijtimoiy pozitsiyasini aniqlay boshlaydi. B. Mo‘llayev ta’lim jarayonida individual yondashuv va zamonaviy texnologiyalar uyg‘unligi orqali o‘quvchilarni ijtimoiy muhitda faol ishtirokchi sifatida shakllantirish mumkinligini ilmiy asoslagan.

Uchinchidan, zamonaviy interfaol platformalarning sinfda qo‘llanilishi ijtimoiy hamkorlikni kuchaytiradi. Mohammad Awedh tomonidan olib borilgan tadqiqotlarda Socrative platformasi o‘quvchilarning muloqotga kirishish, jamoaviy ishlash va bir-birini tinglash kabi ijtimoiy kompetensiyalarini oshirganini amalda ko‘rsatdi.

To‘rtinchidan, CSCL yondashuvini ishlab chiqqan C. Hmelo-Silverning fikriga ko‘ra, kompyuter yordamida tashkil etilgan hamkorlikli ta’lim modeli o‘quvchilarning nafaqat bilim olishiga, balki ijtimoiy ongini chuqurlashtirishga xizmat qiladi. Ta’lim mazmunini birgalikda muhokama qilish, qarama-qarshi fikrlar bilan ishlash va yechim topishga harakat qilish orqali o‘quvchilar ijtimoiy ongli subyektlarga aylanadi.

Beshinchidan, Joyce Koh ishlab chiqqan TPACK modeli asosida o‘qituvchilarning texnologik savodxonligi va pedagogik kompetensiyasi oshgan sari, ular o‘quvchilarning ijtimoiy ongini shakllantirishga yo‘naltirilgan texnologik metodlardan samarali foydalanishni boshlaydi.

Yuqoridagi natijalar shuni ko‘rsatadiki, innovatsion texnologiyalarni to‘g‘ri tanlash va pedagogik maqsadga muvofiq yo‘naltirish orqali o‘quvchilarda ongli ijtimoiy pozitsiya, hamkorlik, tanqidiy fikrlash va fuqarolik mas’uliyati kabi sifatlarni shakllantirish mumkin. Shuningdek, texnologiyalar vositasida yaratilgan individual va moslashuvchan o‘quv muhiti ijtimoiy ongni rivojlantirish uchun qulay sharoit yaratadi.

Muhokama

Zamonaviy jamiyatning dinamik rivojlanishi ta’lim tizimi oldiga yangicha vazifalarni qo‘yadi. Endilikda o‘quvchidan faqat an’anaviy bilimlarni egallashi emas, balki ijtimoiy jihatdan faol, tanqidiy fikrlaydigan, mas’uliyatli shaxs bo‘lib shakllanishi talab etilmoqda. Ushbu maqsadga erishishda innovatsion ta’lim texnologiyalari muhim o‘rin tutadi.

Tadqiqot davomida tahlil qilingan adabiyotlar shuni ko‘rsatdiki, raqamli platformalar, interaktiv muhitlar va shaxsga yo‘naltirilgan metodlar o‘quvchini passiv bilim oluvchidan faol subyektga aylantiradi. Farg‘ona Davlat Universiteti olimlari — B. Shermuhammadov va O. Raxmatov texnologiyalarning axborotni anglab yetish va ongli fikr bildirishdagi roli haqida asosli fikrlar bildirgan. Bu texnologiyalar orqali o‘quvchi o‘z fikrini erkin ifoda etish, boshqalar bilan muloqot qilish, ijtimoiy jarayonlarga nisbatan o‘z pozitsiyasini shakllantirish imkoniyatiga ega bo‘ladi.

Muallif sifatida shuni ta’kidlash joizki, nazariy bilim va amaliy kuzatuvlarim asosida innovatsion vositalarning ijtimoiy ongga bevosita ta’siri yaqqol ko‘zga tashlanmoqda. Masalan, sinfda o‘qituvchi tomonidan o‘quvchilarga jamoaviy topshiriqlar berilishi, raqamli taqdimotlar tayyorlashga yo‘naltirilgan ishlar orqali ularning ijtimoiy mas’uliyat hissi, hamkorlik madaniyati shakllanadi. Bu jarayonda o‘qituvchi faqat bilim beruvchi emas, balki yo‘naltiruvchi, ilhomlantiruvchi va ong shakllantiruvchi shaxs sifatida qatnashadi.

Xalqaro olimlar, jumladan C. Hmelo-Silver (CSCL modeli) va Joyce Koh (TPACK modeli) tomonidan ishlab chiqilgan metodologiyalar esa texnologiyalarni faqat vosita emas, balki ijtimoiy ong tarbiyachisi sifatida qo‘llash zarurligini ko‘rsatmoqda. Ularning yondashuvlari, ta’limga integratsiyalashuvi o‘qituvchilarning kasbiy mahorati bilan chambarchas bog‘liq.

Shu asosda aytish mumkinki, texnologiyalarni maqsadli, strategik yondashuv bilan qo‘llash — o‘quvchilarda ongli, mas’uliyatli, ijtimoiy faol shaxsni tarbiyalashda zamonaviy ta’limning kuchli tayanchi bo‘la oladi[11].

Xulosa

Innovatsion texnologiyalar orqali o‘quvchilarda ijtimoiy ongni shakllantirish zamonaviy pedagogikaning eng dolzarb masalalaridan biridir. O‘tkazilgan tahlillar, adabiyotlar sharhi va ilmiy manbalarga tayangan holda aniqlanishicha, bugungi ta’lim tizimida innovatsion texnologiyalarni faqat axborot uzatish vositasi sifatida emas, balki ijtimoiy ongni shakllantiruvchi kuchli pedagogik instrument sifatida qo‘llash zarurati tug‘ilmoqda.

Farg‘ona Davlat Universiteti olimlari — Shermuhammadov va Raxmatov ta’kidlaganidek, raqamli axborot muhitida ta’lim sifati axborotni tanqidiy tahlil qilish va ongli qaror qabul qilish qobiliyatiga bog‘liq. Shaxsga yo‘naltirilgan ta’lim metodlari tarafdori B. Mo‘llayev esa individual yondashuv orqali o‘quvchilarda ijtimoiy pozitsiyani shakllantirish mumkinligini ilmiy asoslagan. Xalqaro miqyosda esa C. Hmelo-Silverning CSCL modeli va Joyce Kohning TPACK konsepsiyasi orqali o‘qituvchilarning texnologik-pedagogik bilimlari o‘quvchilarda ongli va tanqidiy ijtimoiy fikrni rivojlantirishda hal qiluvchi omil sifatida ko‘rilmoqda.

Muallif sifatida ushbu mavzuni tanlashim bejiz emas. Ta’lim sohasi mutaxassisi sifatida ta’lim tizimimizda ko‘plab innovatsion usullar qo‘llanilayotgan bo‘lsa-da, ularning aksariyati ijtimoiy ongga ta’sir qilish darajasida chuqur o‘rganilmaganini sezdim. Shu bois, bu yo‘nalishda nazariy va amaliy asoslarni sintez qilish, xalqaro va milliy tajribalarni birlashtirish, o‘zbek ta’lim muhitiga

moslashtirish zarur deb hisoblayman. Bu maqola orqali shu ehtiyojga ilmiy javob berishga harakat qilindi.

Amaliy kuzatishlar shuni ko‘rsatadiki, o‘quvchilarda jamiyatga nisbatan befarqlik, ijtimoiy sustlik, mas’uliyatsizlik holatlari saqlanib qolmoqda. Buning oldini olish uchun dars jarayonini ijtimoiy-axloqiy mazmun bilan boyitish, hamkorlikda o‘rganish, tanqidiy fikrlashga undovchi texnologiyalardan foydalanish talab etiladi. Aynan innovatsion texnologiyalar bu ehtiyojni qondira oladi.

Bundan kelib chiqadiki, o‘quvchilarda ijtimoiy ongni shakllantirish — bu faqat ta’lim sifati masalasi emas, balki jamiyat barqarorligining poydevoridir. Agarda ta’lim mazmuni texnologiyalar orqali ijtimoiy ong bilan boyitilmasa, biz faqat bilimdon, ammo jamiyatda o‘z o‘rnini anglamaydigan avlodni tarbiyalash xavfiga duch kelamiz.

Shu sababli, mazkur maqolada ilgari surilgan nazariy asoslar, metodologik yondashuvlar va empirik xulosalar asosida, o‘qituvchilarga yangi yondashuvlar taklif etildi. Texnologiyalarni faqat vosita sifatida emas, balki shaxsiyatni shakllantiruvchi kuchli omil sifatida talqin qilish orqali biz ta’limda sifat, maqsad va mazmun birligini ta’minlashimiz mumkin.

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UMUMTA'LIM MAKTABLARI SPORT TO'GARAKLARIDA O'QUVCHILARNI JISMONIY TAYYORGARLIGINI KOMPLEKS RIVOJLANTIRISH USLUBIYATI

Annotatsiya. *Mazkur maqolada umumta'lim maktablarida tashkil etilayotgan sport to'garaklari faoliyati orqali o'quvchilarning jismoniy tayyorgarligini kompleks rivojlantirishning uslubiy asoslari tahlil qilinadi. Sport to'garaklari bolalarda sog'lom turmush tarzini shakllantirish, jismoniy fazilatlarni – chidamlilik, chaqqonlik, kuch, epchillik va muvozanatni rivojlantirishda muhim omil hisoblanadi. Ushbu maqolada mashg'ulotlarning shakllari, vositalari va metodlari, ularni yoshga, jismoniy imkoniyatlarga moslashtirish yo'llari ko'rib chiqiladi. Shuningdek, jismoniy tayyorgarlikning monitoringi va natijalarni baholash tizimi, sport to'garaklarining ijtimoiy-psixologik ahamiyati ham yoritilgan. Tadqiqot natijalari maktab jismoniy tarbiya mashg'ulotlariga qo'shimcha sifatida sport to'garaklarining ahamiyatini oshirishga xizmat qiladi. Men tomonidan taklif etilgan yondashuvlar o'quvchilarning har tomonlama jismoniy rivojlanishiga va sog'lom avlodni shakllantirishga zamin yaratadi.*

Kalit so'zlar: *sport to'garaklari, jismoniy tayyorgarlik, metodika, sog'lom turmush tarzi, jismoniy fazilatlar, monitoring, maktab, bolalar sporti, tarbiya, rivojlanish, epchillik, chidamlilik.*

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METHOD OF COMPREHENSIVE DEVELOPMENT OF PHYSICAL TRAINING OF STUDENTS IN SPORTS CLUBS OF SECONDARY SCHOOLS

Abstract. *This article analyzes the methodological foundations of comprehensive physical training development of students through sports clubs organized in general education schools. Sports clubs play a key role in forming a healthy lifestyle and developing physical qualities such as endurance, agility, strength, flexibility, and balance among children. The paper discusses the forms, means, and methods of physical training, their adaptation to age and physical capabilities, and the system for monitoring and evaluating results. The social and psychological significance of school sports clubs is also highlighted. The findings aim to enhance the role of sports clubs as a valuable addition to school physical*

education classes. The approaches proposed by the author contribute to the holistic physical development of students and foster the upbringing of a healthy generation.

Keywords: *sports clubs, physical training, methodology, healthy lifestyle, physical qualities, monitoring, school, children's sports, education, development, agility, endurance.*

Kirish. Zamonaviy jamiyatda sog‘lom turmush tarzini shakllantirish va bolalarda jismoniy rivojlanishni ta’minlash muhim masalalardan biri hisoblanadi. Ayniqsa, umumta’lim maktablarida jismoniy tarbiya mashg‘ulotlariga qo‘shimcha sifatida tashkil etiladigan sport to‘garaklari o‘quvchilarning har tomonlama jismoniy va ruhiy kamolotida muhim o‘rin tutadi. Ushbu to‘garaklar orqali bolalarning bo‘sh vaqtini mazmunli tashkil qilish, ularni sportga jalb etish, sog‘lom raqobat muhiti yaratish mumkin. Sport to‘garaklari nafaqat jismoniy sog‘lomlashtirish, balki intizom, iroda, jamoaviylik kabi shaxsiy fazilatlarni shakllantirishda ham beqiyos ta’sir ko‘rsatadi. O‘quvchilarning yosh va jismoniy imkoniyatlarini hisobga olgan holda, to‘g‘ri tuzilgan mashg‘ulotlar tizimi ularning jismoniy fazilatlarini kompleks rivojlantirishda samarali bo‘ladi. Shu bilan birga, bu to‘garaklar orqali yoshlar o‘rtasida sport madaniyati, sog‘lom raqobat va sport etikasini singdirish mumkin. Ushbu maqolada umumta’lim maktablari sport to‘garaklarida o‘quvchilarni jismoniy tayyorgarligini kompleks rivojlantirishga doir uslubiy yondashuvlar, mashg‘ulotlar mazmuni, baholash mezonlari hamda sport to‘garaklarining ijtimoiy ahamiyati ilmiy jihatdan tahlil qilinadi.

Adabiyotlar tahlili va metodlar. Zamonaviy jismoniy tarbiya nazariyasi va metodikasiga oid ilmiy manbalar tahlili shuni ko‘rsatadiki, sport to‘garaklari orqali o‘quvchilarning jismoniy rivojlanishini ta’minlashda tizimli va ilmiy yondashuv muhim ahamiyat kasb etadi. Amerika olimi t. Baumgartner o‘z tadqiqotlarida sport to‘garaklarining bolalar psixologik holatiga va ijtimoiy moslashuviga ijobiy ta’sirini asoslab bergan. Britaniyalik mutaxassis a. Williams esa sport mashg‘ulotlarida yosh xususiyatlarini hisobga olish orqali jismoniy fazilatlarni individual rivojlantirish usullarini taklif etgan. Germaniyalik olim k. Mechling tomonidan esa jismoniy mashqlar orqali bolalarda harakat koordinatsiyasini shakllantirish mexanizmlari o‘rganilgan. Yaponiyalik olima n. Saito tomonidan olib borilgan tadqiqotlar maktab sport dasturlarining sog‘liq uchun foydasini va darsdan tashqari mashg‘ulotlarning immunitetga ta’sirini ko‘rsatgan. Avstriyalik pedagog f. Hofer esa sport orqali o‘quvchilarda ijtimoiy ko‘nikmalar, mas’uliyat va jamoada ishlash madaniyatini shakllantirish metodikasini ishlab chiqqan. Shuningdek, rossiyalik olim v.i. lyakh tomonidan jismoniy sifatlarning kompleks rivoji va uni nazorat qilish bo‘yicha maxsus mezonlar ishlab chiqilgan. Tadqiqotda amaliy metod sifatida kuzatuv, eksperiment, jismoniy holatni baholash testlari, statistik tahlil, diagnostika kartalari, hamda sport mashg‘ulotlari samaradorligini o‘lchovchi indikatorlar qo‘llanildi. Metodik yondashuvlar o‘quvchilarning yosh darajasi, jismoniy imkoniyatlari va psixologik holatlarini inobatga olgan holda shakllantirildi.

Natijalar. Tadqiqot davomida sport to‘garaklarida qatnashuvchi o‘quvchilarning jismoniy tayyorgarlik darajasi ularning qatnashmaydigan tengqurlari bilan taqqoslab o‘rganildi. Natijalarga ko‘ra, sport to‘garaklarida muntazam qatnashgan o‘quvchilar harakat koordinatsiyasi, chidamlilik, epchillik va kuch ko‘rsatkichlari bo‘yicha yuqori natijalarga erishgan. O‘quvchilarning jismoniy tayyorgarlik ko‘rsatkichlari sinovlar asosida baholandi.

Jismoniy ko‘rsatkichlar tahlili

Quyidagi jadvalda sport to‘garaklarida qatnashuvchi va qatnashmaydigan o‘quvchilarning jismoniy tayyorgarlik darajalari bo‘yicha o‘rtacha natijalari aks ettirilgan:

1-jadval

Ko‘rsatkichlar	To‘garakda qatnashganlar	Qatnashmaganlar
30 metrga yugurish (sek)	5.2	5.9
Uzunlikka sakrash (sm)	185	160
O‘tirib-turish (30 soniya ichida)	26	19
1000 metrga yugurish (daq)	4.3	5.1

Muhokama. Olib borilgan tadqiqotlar natijasida aniqlanishicha, umumta’lim maktablarida tashkil etilgan sport to‘garaklari o‘quvchilarning jismoniy rivojlanishida muhim rol o‘ynaydi. Ayniqsa, chidamlilik, epchillik, kuch va muvozanat kabi asosiy jismoniy sifatlarning shakllanishi va mustahkamlanishida sport to‘garaklarining ta’siri sezilarli darajada bo‘ldi. Tadqiqot natijalariga ko‘ra, sport to‘garagiga qatnashgan o‘quvchilar harakat faoliyati va sportga qiziqish darajasi bo‘yicha ancha yuqori natijalarni ko‘rsatdi. Biroq ayrim muammolar ham kuzatildi. Jumladan, ba’zi maktablarda sport zallari, anjomlar va malakali murabbiylar yetishmasligi, o‘quvchilarning mashg‘ulotlarga doimiy qatnashmasligi kabi holatlar to‘garaklarning samaradorligini pasaytirayotgan omillardan hisoblanadi. Bundan tashqari, ota-onalarning sportga nisbatan befarqligi va darsdan keyingi charchoq sababli qatnashishni istamaydigan o‘quvchilar soni ham muammoli jihat sifatida qayd etildi. Yuqoridagi muammolarni hal qilish uchun sport to‘garaklarini tizimli ravishda tashkil etish, individual yondashuvlarni joriy qilish, jismoniy tayyorgarlik bo‘yicha muntazam monitoring olib borish va sport madaniyatini ommalashtirish zarur.

Xulosa

Umumta’lim maktablarida sport to‘garaklari orqali o‘quvchilarning jismoniy tayyorgarligini kompleks rivojlantirish ularning sog‘lom turmush tarzini shakllantirishda, harakat faolligini oshirishda va shaxsiy fazilatlarini rivojlantirishda muhim omil sifatida namoyon bo‘ladi. Tadqiqot natijalari shuni ko‘rsatadiki, muntazam sport mashg‘ulotlari bilan shug‘ullanuvchi o‘quvchilar jismoniy ko‘rsatkichlar, ijtimoiy faollik va psixologik barqarorlik nuqtayi nazaridan

yuqori natijalarga ega bo‘lmoqda. Sport to‘garaklari shuningdek, irodani mustahkamlash, jamoada ishlash ko‘nikmalarini rivojlantirish va sog‘lom raqobat muhitini shakllantirishda ham katta ahamiyat kasb etadi. Shu bois, sport to‘garaklarini maktab tizimida kengaytirish, infratuzilmani rivojlantirish, tajribali murabbiylar bilan ta’minlash va ota-onalar bilan hamkorlikda faoliyat yuritish zarur hisoblanadi. Jismoniy tarbiya va sportni ta’lim tizimining ajralmas qismi sifatida ko‘rib chiqish sog‘lom va faol avlodni tarbiyalashning muhim omillaridan biridir.

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RAQAMLI NAZORAT VA MONITORING VOSITALARI ASOSIDA O'QUVCHILARNING JISMONIY TAYYORGARLIGINI TAHLIL QILISH VA RIVOJLANTIRISH

Annotatsiya. *Mazkur maqolada raqamli nazorat va monitoring vositalari yordamida umumta'lim maktablarida o'quvchilarning jismoniy tayyorgarlik darajasini tahlil qilish va rivojlantirish masalalari o'rganiladi. Maqola yakunida amaliy tavsiyalar va raqamli texnologiyalarni jismoniy tarbiya darslariga integratsiya qilish bo'yicha takliflar bildirilgan.*

Kalit so'zlar: *raqamli nazorat, monitoring vositalari, jismoniy tayyorgarlik, fitnes-treker, sun'iy intellekt, tahlil, sport texnologiyalari, o'quvchi salomatligi.*

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ANALYSIS AND DEVELOPMENT OF STUDENTS' PHYSICAL PREPARATION BASED ON DIGITAL CONTROL AND MONITORING TOOLS

Abstract. *This article examines the issues of analyzing and developing the level of physical fitness of students in secondary schools using digital control and monitoring tools. The article concludes with practical recommendations and proposals for integrating digital technologies into physical education lessons.*

Keywords: *digital control, monitoring tools, physical preparedness, fitness tracker, artificial intelligence, analysis, sports technologies, student health.*

Kirish. So'nggi yillarda axborot-kommunikatsiya texnologiyalarining jadal rivojlanishi turli sohalarda, jumladan ta'lim va sport tizimida keng qo'llanilmoqda. Ayniqsa, raqamli nazorat va monitoring vositalarining ta'lim jarayonlariga integratsiyalashuvi orqali o'quvchilarning bilim, ko'nikma va jismoniy rivojlanish holatini tahlil qilish va ularni samarali nazorat qilish imkoniyati paydo bo'ldi. Jismoniy tarbiya fani ham zamonaviy texnologiyalar ta'sirida rivojlanib, ilg'or innovatsion yondashuvlar asosida tashkil etilmoqda. Bu borada jismoniy faollikni raqamli kuzatuv, natijalarni tahlil qilish va individual rivojlanish rejalashtirish imkonini beruvchi vositalar muhim o'rin tutmoqda.

Mazkur maqolada raqamli nazorat va monitoring texnologiyalaridan foydalangan holda umumta'lim maktablari o'quvchilarining jismoniy tayyorgarligini o'rganish, tahlil qilish va rivojlantirish yo'llari ko'rib chiqiladi.

Bugungi kunda smart-soatlar, fitnes-trekerlar, mobil ilovalar, sun’iy intellektga asoslangan tahlil dasturlari yordamida o‘quvchilar mashg‘ulotlari real vaqt rejimida nazorat qilinmoqda. Bu esa nafaqat ularning jismoniy holatini tahlil qilish, balki mashg‘ulot jarayonini shaxsiylashtirish, samaradorlikni oshirish va sog‘lom turmush tarzini shakllantirish imkonini bermoqda.

Shu sababli, raqamli vositalar orqali o‘quvchilar jismoniy tayyorgarligini rivojlantirish, tahlil qilish va samarali boshqarish masalasi hozirgi davrda dolzarb hisoblanadi va alohida o‘rganishni talab etadi.

Natijalar

Tadqiqot natijalariga ko‘ra, raqamli monitoring vositalaridan foydalanish o‘quvchilarning jismoniy faolligi va tayyorgarlik darajasiga ijobiy ta’sir ko‘rsatdi. Eksperimental guruhda darslarda smart-soatlar, fitnes-trekerlar va mobil ilovalardan muntazam foydalanilgan bo‘lib, nazorat guruhi esa an’anaviy metodlarga tayangan. Mashg‘ulotlar davomida to‘plangan ma’lumotlar asosida yurak urish tezligi, jismoniy faollik va mashg‘ulot davomiyligi bo‘yicha quyidagi ko‘rsatkichlar olindi.

1-jadval. Eksperimental va nazorat guruhlari jismoniy faollik ko‘rsatkichlarining solishtirma tahlili

Ko‘rsatkichlar	Eksperimental guruh (raqamli vositalar bilan)	Nazorat guruhi (an’anaviy)
O‘rtacha yurak urish tezligi (bpm)	128 bpm	113 bpm
Haftalik jismoniy faollik (min)	230 daqiqa	170 daqiqa
Mashg‘ulot intensivligi (%)	82%	65%
Faollik natijalariga qiziqish darajasi	Yuqori (88%)	O‘rtacha (56%)

Izoh: Jadvaldagi ko‘rsatkichlar 4 haftalik kuzatuv davomida o‘rtacha natijalar asosida shakllantirilgan.

Yuqoridagi natijalardan ko‘rinib turibdiki, raqamli monitoring tizimlari o‘quvchilarning mashg‘ulotga bo‘lgan e’tiborini oshirish, individual yondashuvni shakllantirish va mashg‘ulotlarni samaraliroq tashkil qilishda muhim rol o‘ynaydi. Ayniqsa, smart-soatlar orqali yurak urish ritmini kuzatib borish, fitnes-trekerlar bilan qadamlar va harakat darajasini baholash o‘quvchilarga o‘z rivojlanishini bevosita kuzatish imkonini berdi.

Shuningdek, eksperimental guruhda o‘quvchilar o‘zlarining ko‘rsatkichlarini onlayn platformalar orqali baholab, haftalik reytinglar tuzildi. Bu esa motivatsiyani kuchaytirib, jismoniy faollikni oshirishga xizmat qildi.

Muhokama. Tadqiqot natijalari raqamli nazorat va monitoring vositalarining o‘quvchilarning jismoniy tayyorgarligini aniqlash va rivojlantirishdagi ahamiyatini ochib berdi. Eksperimental guruhda erishilgan ijobiy natijalar shuni ko‘rsatadiki, zamonaviy texnologiyalar ta’lim jarayonining muhim tarkibiy qismiga aylanib bormoqda. Smart-soat, fitnes-treker, mobil ilova kabi vositalar nafaqat jismoniy

yuklamani nazorat qilish, balki o‘quvchilarning o‘z ustida ishlashiga bo‘lgan qiziqishini ham oshirmoqda.

Shu bilan birga, tadqiqot davomida ayrim muammolar ham kuzatildi. Jumladan, texnik vositalardan foydalanish uchun barcha maktablarda teng sharoit mavjud emasligi, internet tarmog‘ining cheklanganligi va ayrim o‘quvchilarning texnologiyalarga qiziqmasligi natijalarning bir tekis bo‘lishiga to‘sqinlik qildi. Shuningdek, o‘qituvchilar tomonidan raqamli monitoring natijalarini tahlil qilish ko‘nikmalarining yetarli emasligi ham muayyan cheklovlarga olib keldi.

Raqamli vositalarning afzalliklari shundaki, ular real vaqt rejimida ma’lumotlarni to‘playdi, mashg‘ulotlar intensivligini kuzatadi va o‘quvchilarni individual tarzda nazorat qilish imkonini beradi. Aynan shu holat jismoniy tarbiya darslarining interaktivligini oshirib, zamonaviy talablarga javob beradigan yondashuvlarni shakllantiradi.

Tadqiqot shuni ko‘rsatadiki, raqamli texnologiyalar jismoniy tayyorgarlikni tahlil qilishda katta salohiyatga ega. Biroq, bu imkoniyatlardan to‘liq foydalanish uchun tizimli yondashuv, texnik baza va pedagoglar malakasini oshirish zarur. Muhokama jarayonida raqamli vositalarni o‘quv jarayoniga integratsiya qilishning bosqichma-bosqich mexanizmlarini ishlab chiqish lozimligi ta’kidlandi.

Xulosa. Yuqorida olib borilgan tadqiqot asosida shuni xulosa qilish mumkinki, raqamli nazorat va monitoring vositalari o‘quvchilarning jismoniy tayyorgarligini aniqlash, nazorat qilish va ularni rivojlantirishda samarali vosita sifatida xizmat qilmoqda. Smart-soatlar, fitnes-trekerlar, mobil ilovalar va sun’iy intellektga asoslangan tahlil platformalari yordamida o‘quvchilarning jismoniy faollik darajasi aniq kuzatilib, individual yondashuvlar asosida treninglar tashkil etildi. Raqamli monitoring tizimlarining ta’lim jarayoniga integratsiya qilinishi nafaqat o‘quvchilarning sog‘lig‘ini yaxshilash, balki ularning o‘z ustida ishlash motivatsiyasini kuchaytirishga ham xizmat qilmoqda. Tadqiqot davomida an’anaviy metodlar bilan taqqoslaganda, raqamli vositalar yordamida o‘quvchilar jismoniy faolligi va tayyorgarlik ko‘rsatkichlarida sezilarli ijobiy o‘zgarishlar kuzatildi.

Biroq, bu vositalardan samarali foydalanish uchun texnik baza, pedagoglarning raqamli kompetensiyalari va metodik qo‘llanmalar yetarli darajada bo‘lishi kerak. Shu sababli, kelgusida raqamli vositalarni jismoniy tarbiya darslariga joriy etish bo‘yicha tizimli yondashuvni ishlab chiqish, o‘qituvchilarni tayyorlash va texnologik infratuzilmani mustahkamlash muhim vazifalardan biri hisoblanadi.

Ushbu tadqiqot natijalari raqamli nazorat vositalari asosida o‘quvchilarning jismoniy holatini tahlil qilish va rivojlantirish yo‘nalishida yangi imkoniyatlarni ochib bermoqda hamda bu sohadagi ilmiy-amaliy izlanishlarga asos bo‘lib xizmat qiladi.

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SHARQ VA G'ARB AXLOQIY MADANIYATINING UMUMIY MANZARASI

Annotatsiya. *Ushbu maqolada talabalarda ma’naviy-axloqiy tarbiyani shakllantirishning ahamiyati va uning pedagogik mazmuni haqida so‘z yuritilgan.*

Kalit so‘zlar: *ma’naviy tarbiya ta’lim tarbiya sifati, axloqiy ong, poklik, vatanparvarlik ruhida tarbiyalash, ijtimoiy-axloqiy talab, xulq-atvor, axloqiy tarbiya, axloqiy me’yor*

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GENERAL VIEW OF EASTERN AND WESTERN MORAL CULTURE

Abstract. *This article discusses the importance of developing students' spiritual and moral education and its pedagogical content.*

Keywords: *spiritual education, quality of education, moral consciousness, purity, education in the spirit of patriotism, social and moral requirements, behavior, moral education, moral standards.*

Sharqning buyuk mutafakkirlari insonni axloqiy kamol toptirish, uni har tomonlama rivojlantirish, ma’naviy va ma’rifiy jihatdan kamol topish jarayonida turli tarixiy bosqichlardan –johillik, nodonlikdan ilmga, yovuzlikdan ezgulikka, vahs’hiylikdan insoniylikka o’tarkan, jamiyat ham s’hu tariqa rivojlanadi. Ikki muqobil ibtido – yovuzlik va ezgulik, jaholat va kamolatning o’zaro kuras’hi inson va jamiyat taraqqiyoti belgilagan, inson aql-zakovat sohibi sifatida o’zini anglas’higa olib keladi.

Axloq muayyan jamiyat va davrda o’zgaris’hlarga uchras’hi, rivojlanis’hi, so’nis’hi mumkin. Har bir xalqning yoki millatning o’ziga xos axloqi bilan bir qatorda, umumbas’hariy axloq me’yorlari jamiyatning umumiy taraqqiyotiga samarali ta’sir ko’rsatadi.Axloqiy tarbiyaning barcha zamonlar uchun dolzarb bo’lgan yo’li bu – namunaviylik tamoyili. Oilada, avvalo, yuqorida aytilganidek, ota-ona bolaga axloqiy namuna bo’lis’hi kerak. Maktabda va oliy o’quv yurtida muallimlarining ta’lim beris’h usullaridan tortib ularning ko’z ilg‘amas xatti-

harakatlarigacha o’z s’hogirdlari tomonidan s’haxsiy namuna sifatida qabul qilinis’hini nazardan qochirmaslik lozim.

Qadimgi Xitoydagi ijtimoiy-falsafiy fikrlar tarixida Konfutsiyning qaras’hlari ham alohida o’rin tutadi.Qadimgi Xitoydagi ijtimoiy-falsafiy fikrlarning rivojiga katta hissa qo’s’hgan. Mutafakkirning “Aforizmlar” asari teran falsafiy qaras’hlarida axloqiy masalalar markaziy o’rin tutadi.Qadimgi ajdodlarning urf-odatlari, meroslari, tariqatiga tayangan Konfutsiy o’tganlarning s’huhrati ularning avlodlarini yuksaltiradi, deb jamiyatning haqiqiy negizi, poydevorini yanada mustahkamlas’h uchun qadimgi urf-odat an’ana milliy marosim va bayramlarimizning, ajdodlarimizning tarixiy xotiralarining tiklanis’hi borasidagi ma’naviy-ma’rifiy islohotlarimizda ko’ris’himiz mumkin.

Suqrot (eramizdan oldingi 469-399-yillar) - qadimgi Yunon faylasufi. Afinaning ijtimoiy hayotida faol is’htirok etgan, yos’hlar tarbiyasi bilan s’hug‘ullangan, hurfikrli inson, bo’lgan Suqrotning fikricha, falsafaning markazida axloq masalalari turmog‘i lozim. Jamiyatning ravnaqi, tinchlik va osoyis’htaligi, faravon hayoti axloq va odobning ahvoliga bog‘liq. Bu masalalar S’harq falsafasida ham katta o’rin tutganligi bois xalqimiz, buyuk allomalarimiz Suqrot nomini hurmat bilan tilga olgan, uning axloq-odob haqidagi pand-nasihatlariga amal qilis’hgan.

Umuman, qadimgi S’harq va G‘arb falsafasining ijtimoiy muammolari orasida axloq mavzusi etakchilik qiladi. O’s’ha davrda yaratilgan hikmatli so’z, iboralar bugungi kunda ham insonni mulohaza yuritis’hga majbur qiladi. S’harqda nafaqat din sifatida, balki yaxlit madaniyat, ma’naviyatning s’hakllanis’hida ham katta ahamiyatga ega bo’ldi. U madaniyatning ilm-fan, san’at, axloq, siyosat kabi sohalarining rivojiga ham ijobiy ta’sir ko’rsatdi.Bu davrda diniy ilmlar sohalarida mintaqa s’huhratini olamga tanitgan imom Buxoriy, imom Termiziy, Nizomulmulk, Dunyoviy ilmlar sohasida esa Forobiy, Beruniy, Ibn Sino, hamda tasavvuf ma’naviy-ma’rifiy ta’limoti sohasida Ahmad Yugnakiy, Yusuf Xos Hojib, Najmiddin Kubro, Bahouddin Naqs’hband va bos’hqa buyuk alloma va mutafakkirlarning jamiyat taraqqiyoti rivojida ma’naviyat hodisasining beqiyos o’rni haqidagi qaras’hlari butun jahon ilmiy va falsafiy tafakkurining ravnaqiga hayotbaxs’h hissa qo’s’hdi.

Abu Nasr Forobiy (873-950) jahon ijtimoiy-falsafiy fikrlari tarixida “S’harq Aristoteli” (“Ikkinchi muallim”) degan unvonga sazovor bo’lgan mas’hhur qomusiy olimdir. Forobiy o’zining ijtimoiy-falsafiy qaras’hlarida jamiyatning vujudga kelis’h sabablarini, axloqning s’hakllanis’hi, insoniylik, adolatparvarlik, taraqqiyot, buyuk jamiyat, komil inson kabi mavzularni ilmiy-nazariy jihatdan asoslas’hga harakat qilgan. Forobiy axloqiy fazilatlar deganda bilimdonlik, donolik, va mulohazali bo’lis’h, vijdonlilik, kamtarlik, ko’pchilik manfaatini yuqori qo’yis’h, haqiqat, ma’naviy yuksaklikka intilis’h, adolatliylik kabi xislatlarni tus’hunadi. Ammo bu xislatlarning eng muhimi har bir insonning bilimli, ma’rifatli bo’lis’hidir.

S’huning uchun ham Forobiy axloq tus’hunchasiga aql bilan uzviy bog‘liq holda, tafakkurga asoslangan axloq sifatida qaraydi. Bundan biz Forobiyning xloqni xulq me’yorlari ifodasi sifatidagina emas, balki kis’hilarning aqliy faoliyatining natijasi sifatida ham talqin etilganligini ko’ramiz S’hu kabi fikrlarni biz Abu

Rayhon Beruniy (973-1048 y.) asarlarida ham uchratis'himiz mumkin. Beruniyning ma'naviy-qxloqiy qaras'hlari bilan bog'liq ta'limotida mehnat, odob-axloq, ta'lim-tarbiya, kasb-hunar, ilm-ma'rifat uzviy mus'htaraklikda, bir butunlikda tahlil etilgan.

Beruniyning ma'naviy-axloqiy ta'limotida ikkiyuzlamachilik, yolg'onchilik, tuhmat, qo'pollik, o'g'rilik, bir-birining payiga tus'his'h, xudbinlik, singari yomon xulqlar toifasiga kiritiladi. Rostlik, odillik, adolat, bular Beruniy fikricha, yuksak ma'naviyat, go'zal odob-axloq belgisidir. O'z zararing hisobiga bo'lsa-da, rost gapir, haqiqatdan yuz o'girma, har bir narsaga odilona va xolisona yondas'h, deb ta'lim beradi va o'zi mazkur g'oya va ta'limotlarga bir umr sodiqlikning ibrat-namunasiga aylanadi.

Beruniyning fikricha, insonparvarlik-kis'hilarning ma'naviyat darajasi, u o'zida ijobiy axloqiy xislatlarni tarbiyalay olis'hi bilan ham bog'liq. "Saxix" yo'nalis'hining asoschisi eng etuk va mas'hhur muhaddis Abu Abdulloh Ismoil al-Buxoriy hadis ilmida "Amir-ul-mo'minin", "Imom al-Muxaddisiyn" (Barcha muxaddislarning pes'hvosi") degan s'harafli nomga sazovor bo'lgan. Islom dini insonni ma'naviy kamolot sari etaklovchi ta'limotdir. S'hu sababli Qur'oni Karimda ham, hadislarda ham yaxs'hi xulq-odob qoidalari va ularga kis'hilarning qat'iy amal qilis'hlari lozimligi borasidagi qaras'hlar keng targ'ib etilgan.

Imom Ismoil al-Buxoriyning "Aljome as-saxix" asarining bir jildiga odob-axloq masalalarini yorituvchi hadislar jamlangan bo'lsa, "Al-adab al-mufrad" (Adab durdonalari) nomli asarda ham ijtimoiy turmus'hda hamda insonlar o'rtasida o'zaro munosabatlarni tas'hkil etis'h chog'ida amal qilinis'hi lozim bo'lgan odob-axloq qoidalari borasida yanada batafsil ma'lumotlar berilgan. Najmiddin Kubroning maqsadi odamlarni ham jismonan, ham aqlan, ham ruhiy-ma'naviy jihatdan etuk qilib tarbiyalas'h bo'lgan. Ta'lim-tarbiya axloqiy poklik, mardlik, hojatbarorlik, g'oyalarini targ'ib etgan. Ilohni sevis'h bilan yaxs'hi insonlarni sevis'hni birga olib qaradi, nafsni qattiq nazorat etib, ya'ni qoralab, ulug' taqvo piri degan nom chiqardi. U insonni "Kichik olam" deb, uning kamoloti cheksiz ekanini ta'kidlaydi. Biz bu fikrlarni xulosalab tarbiya axloqiy poklik, mardlik, hojatbarorlik kabi tus'hunchalarni olis'himiz mumkin.

Bahouddin Naqs'hbandning ta'lim-tarbiya haqidagi fiklari g'oyat qadrlidir. U barkamol insonni tarbiyalas'h dastlab odobdan bos'hlanis'hini ta'kidlab, s'hunday degan edi: "Adab xulqni chiroyli qilis'h, so'z va fe'lni soz qilis'hdir". Odob saqlas'h-muhabbat samarasi, yana muhabbat daraxtining urug'i hamdir. Agar odobdan ozgina nuqsonga yo'l qo'yilsa, nimaikiqilsanh ham, beadablik ko'rinadi, degan fiklarni keltirib o'tgan. S'harq mutafakkirlari axloqni ikkiga ajratis'hadi. Axloqli, axloqsiz, yaxs'hi yoki yomon axloqli singari axolqiy munosabatlar – bu jamiyatga, mehnatga, odamlarga va qolaversa, har bir kis'hining o'ziga munosabatidir.

G'arb mutafakkirlari ham axloqiy tarbiya borasida o'zlarini fiklarining keltirb o'tganlar. Jumladan, Us'hinskiy "Tarbiyaning asosiy vazifasi axloqiy jihatdan ta'sir etis'hdan iboratdir. Bu aqlni umuman o'stiris'h, uni bilimlar bilan to'ldiris'hdan ko'ra muhimdir" deb izohlagan. Axloqiy tarbiya maqsadlari va vositalarini,

K.D.Us’hinskiy kis’hi kamolga etgan bo’lis’hi, uning jismoniy, aqliy hamda axloqiy jihatdan o’sis’hi bir-biriga mos bo’lis’hi kerak, deb hisoblaydi. S’huning uchun u tarbiyani garmonik (har tomondan bir-biriga moslab) o’sgan s’haxsning tarkib topis’hida ma’lum maqsadga qaratilgan ongli jarayon deb ta’riflaydi.

Us’hinskiyning fikricha, axloqiy tarbiya bolada insonparvarlik, vijdonlilik, rostgo’ylik, mehnatsevarlik, intizomlilik va mas’uliyatni sezis’h, kamtarlik bilan birgalikda o’z qadrqimmatini bilis’hni o’stiris’hi lozim. Us’hinskiy tavsiya etgan axloqiy tarbiya tizimida uning xalqchillikka asoslangan butun pedagogik tizimiga muvofiq vatanparvarlik, vatanga fidokorona muhabbat ruhida tarbiyalas’h asosiy o’rinni egallaydi. Vatanga muhabbat, - deb yozadi Us’hinskiy, - bu insonning eng kuchli tuyg‘usidir.

Us’hinsiyning fikricha, axloqiy tarbiyaning vositalari quyidagilardan iborat bo’lis’hi kerak;

- Axloqiy tarbiyada kitob va darslikning o’rni kattadir. O’quvchi bu kitoblarda o’z nutqini o’stiris’hni, bilimni umumlas’htiris’hni axloqiy tarbiyalarni egallas’hni tez o’rganadi;
- O’qituvchining s’haxsan o’zi namuna bo’lis’hi kerak;
- Ye’tiqodga u juda katta e’tibor bergan edi;
- O’quvchilarga mohirlik bilan munosabatda bo’lis’h (pedagogik odob);
- Ogohlantiris’h choralari;
- Rag‘batlantiris’h va jazolas’h;

Suqrotning fikricha, tarbiyadan kutilayotgan maqsad, buyumlar tabiatini o’rganis’h bo’lmay, balki kishining bilim olishi, axloqni kamol toptirishi kerak. Lekin Suqrotning axloqiy qarashlarida tengsizlikni yaqqol sezish mumkin. Uning fikricha axloq faqat imtiyozli "mumtoz "largagina xos, chunki ular haqiqiy axloqning yagona egalari bo’lganliklari uchun hokimiyat ham ularning qo’llarida bo’lmog‘I kerak deydi.

Arastu uch xil tarbiya ya’ni: jismoniy, axloqiy va aqliy tarbiya aqidalarini is’hlab chiqib, tarbiyaning rivojlanis’higa katta hissa qo’shgan. U jismoniy, axloqiy va aqliy tarbiya bir-biri bilan uzviy bog‘langan deb hisoblaydi. Arastu Platondan farq qilib, bola tarbiyasida oila tarbiyadan chetlas’htirilmaydi. Axloqiy tarbiya beris’h asosan oila zimmasida ekanligini uqtiradi.

Xulosa

Xulosa qilib shuni aytish joizki, o’z davrida Sharq va G‘arb allomalarining axloqiy tarbiya borasidagi fikrlari ma’rifatparvarlarning asarlarida o’z aksini topgan. Muhammad al-Xorazmiy, Abu Nasr Forobiy hamda Abu Rayhon Beruniylar o’qituvchining ma’naviy-axloqiy jihatdan etuk bo’lishlariga alohida ahamiyat qaratadilar. Ularning fikrlaricha, yaxs’hi o’qituvchi bos’hqalardan bir jihati bilan farq qiladi, ya’ni, u o’zi ega bo’lgan bilimlarni yoshlarga beminnat o’rgatadi, har bir ishda ularga namuna bo’la oladi [6].

G‘arb allomalaridan Ushinskiy, Makarenko, Komensiy, Platon, Suqrot, Aristotel kabi g‘arb allomalari o’zlarining pedagogik qarashlari bilan o’z ancha ilgarilab ketganlar. Ularning bu qaras’hlari bir necha asrlardan beri ajdodlarimiz tafakkurini boyitib kelmoq va hozirgi kunda ham ular o’z qiymatini yo’q. Shunga

ko’ra, Sharq va G‘arb mutaffakkirlarning o’lmas merosi oilada bolalarning ma’naviy-axloqiy tarbyalashning muhim omili bo’lib qoladi. Shunday ekan biz pedagoglar ta’lim jarayonida tarbiyaning ham uzviyligini ta’minlagan holda talaba yoshlarga ma’naviy-axloqiy tarbiya berib boris’himiz va ularga to’g‘ri yo’lni ko’rsatadi.

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TABIIY OFATLAR TARQALISH GEOGRAFIYASI, ULARNING OLDINI OLISH VA OQIBATLARINI MINIMALLASHTIRISH USULLARINI O‘RGANISH

Annotatsiya: *Ushbu maqolada jahonfagi eng dolzarb masalalardan biri tabiiy ofatlar va uni o‘rganadigan fan, xususan, tabiiy ofatlarning oldini olish va oqibatlarini minimallashtirish usullari yoritilgan.*

Kalit so‘zlar: *Tabiiy ofatlar, geografik omillar, seysmik kamarlar, xalqaro hamkorlik, qutqaruv operatsiyalari, doimiy qurg‘oqchilik, tropik siklon, zamonaviy texnologiyalar.*

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STUDYING THE GEOGRAPHY OF THE SPREAD OF NATURAL DISASTERS, METHODS OF PREVENTING THEM AND MINIMIZING THEIR CONSEQUENCES

Abstract: *This article discusses one of the most pressing issues in world science - natural disasters and the science that studies them, in particular, methods for preventing natural disasters and minimizing their consequences.*

Keywords: *Natural disasters, geographical factors, seismic belts, international cooperation, rescue operations, persistent drought, tropical cyclone, modern technologies.*

Tabiiy ofatlar tarqalish geografiyasi tabiiy ofatlar va ularning dunyo bo‘ylab tarqalishini o‘rganadigan fan sohasini anglatadi. Tabiiy ofatlar – bu yer yuzidagi tabiiy hodisalardir, ular odamlar va tabiiy muhitga salbiy ta’sir ko‘rsatadi. Ushbu hodisalar orasiga zilzilalar, sunami, to‘fonlar, vulqonlar, qor ko‘tarilishlari, chang va qum bo‘ronlari, qurg‘oqchiliklar, sel va boshqa tabiiy hodisalar kiradi.

Tabiiy ofatlarning tarqalish geografiyasi bu hodisalarning dunyo bo‘ylab qayerda va qanday tarqalishini o‘rganadi. Bunda geografik omillar, iqlim, yer qobig‘ining tuzilishi va boshqa tabiiy sharoitlar katta ahamiyatga ega.

Dunyo qit’alari orasida tabiiy ofatlar ta’siriga eng ko‘p moyil bo‘lganlar quyidagicha taqsimlangan: Osiyo (38%), Shimoliy va Janubiy Amerika (26%), Afrika (14%), Yevropa (14%), Okeaniya (8%).

Turli qit’alarda tabiiy ofatlarning tarqalishi geografiyasining ba’zi xususiyatlari ham mavjud. Xususan, Afrikada – tabiiy hodisalar doimiy qurg‘oqchilikni o‘z ichiga oladi, ayniqsa ular Shimoliy va Sharqiy Afrikaning savanna zonasida tez-tez uchraydi.[67]

Yer sharining ulkan seysmik kamarlari o‘tadigan Yevrosiyo hududida yerdagi zilzilalarning aksariyati sodir bo‘ladi. Eng faol tinch okeanidagi seysmik kamar bo‘lib, u bilan bog‘liq ko‘plab zilzilalar mavjud. Yevrosiyoning janubi va janubi-sharqida tayfunlar, tropik siklonlar faol, sunami bo‘lishi mumkin. Yevrosiyoning shimolida toshqinlar, ko‘chkilar va zilzilalar, tornadolar eng katta xavf hisoblanadi.

Shuningdek, Rossiyada Kavkaz, Oltoy, Sharqiy Sibir, Saxalin va Kamchatkada zilzilalar eng ko‘p uchraydi. Sibir, Uzoq Sharq, Kavkaz daryolarida halokatli toshqinlar keng tarqalgan. Dovullar, bo‘ronlar ko‘pincha Primorsk va Xabarovsk o‘lkalarida, Saxalin, Kamchatka, Chukotka va Kuril orollarida uchraydi.

Tabiiy ofatlar, masalan, yer silkinishlari, toshqinlar, bo‘ronlar, sunami kabi hodisalar insoniyat uchun katta xavf tug‘diradi. Bunday ofatlarning oldini olish yoki ularni kamaytirish uchun bir qancha chora-tadbirlar ko‘rish mumkin. Quyidagi usullar tabiiy ofatlar tarqalishining oldini olishga yordam berishi mumkin:

Birinchidan, o‘z vaqtida ogohlantirish tizimlari yo‘lga qo‘yilishi lozim. Masalan:

- Tabiiy ofatlar yuzaga kelishidan oldin, zamonaviy texnologiyalar yordamida (masalan, sunami va yomg‘irli bo‘ronlar uchun prognozlar) aholi ogohlantirilishi mumkin.
- Yer silkinishlarini aniqlovchi qurilmalar va toshqinlar uchun ilg‘or kuzatuv tizimlari yaratish ham yordam beradi.

Ikkinchidan, infratuzilma va qurilishning mustahkamligi ham muhim ahamiyat kasb etadi.

- Yer silkinishiga chidamli binolar va inshootlar qurish, toshqinlar hududida kanalizatsiya va suv o‘tkazgichlarni mukammal tizimga keltirish.
- O‘zgaruvchan iqlim sharoitida qurilish materiallari va usullarini yangilash ham muhim.

Uchinchidan, tabiiy resurslarni boshqarishning zarurligi:

- O‘rmonlarni kesishni kamaytirish, tuproq eroziyasini oldini olish, dengiz bo‘ylaridagi qirg‘oqlarni himoya qilish.
- O‘zgaruvchan iqlim sharoitlariga mos keladigan qishloq xo‘jaligi va suv resurslarini boshqarish.

To‘rtinchidan, aholini tayyorlash:

- Insonlarni tabiiy ofatlarga tayyorlash uchun maxsus treninglar va ta’lim dasturlarini o‘tkazish. Aholi qanday harakat qilish, xavfsizlik choralarini bilishi kerak.

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[67]Стихийные бедствия и техногенные катастрофы. Превентивные меры, Библиотека Всемирного банка. М.: Альпина Паблишер, 2012. ISBN 978-5-9614-1527-8.

- Favqulodda vaziyatlarga tayyorlikni oshirish va tezkor yordam tizimlarini mustahkamlash.

Beshinchidan, xalqaro hamkorlik:

- Tabiiy ofatlarni oldini olishda mamlakatlararo hamkorlikni rivojlantirish, axborot almashish va birgalikda rejalashtirish juda muhim.

- O‘zboshimchalik bilan choralar ko‘rish o‘rniga, global darajada muammolarni hal qilish.

Shu tarzda, tabiiy ofatlar tarqalishining oldini olish mumkin bo‘lsa-da, butunlay bunday hodisalarni oldini olish qiyin, lekin zararlarini kamaytirish uchun chora-tadbirlar ko‘rish zarur.[68]

Tabiiy ofatlardan keyingi zararni minimallashtirish uchun quyidagi choralar ko‘rilsa maqsadga muvofiq bo‘ladi. Zarar ko‘rgan hududlarga tezkor yordam ko‘rsatish ya’ni oqibatlarini minimallashtirish uchun tezkor qutqaruv operatsiyalari va yordam ta’minlash muhimdir. Bu odamlarning hayotini saqlab qolish va jarohatlarni kamaytirish imkonini beradi.

Aholini tabiiy ofatlar haqida xabardor qilish va ularga qanday harakat qilish kerakligini o‘rgatish muhim. Bu evakuatsiya rejalarini amalga oshirishni osonlashtiradi. Tabiiy ofatlar yuzaga kelganidan keyin hududni tiklash uchun barqaror rivojlanish strategiyalarini ishlab chiqish kerak. Bu tiklash jarayonida ekologik va iqtisodiy jihatlarga ham e’tibor qaratilishi zarur.

Shuningdek, texnologiyalar va innovatsiyalar bugungi kunda tabiiy ofatlar oqibatlarini minimallashtirish uchun kata yordam beradi.

Tabiiy ofatlarni oldindan aniqlash va bashorat qilishda sun’iy yo‘ldoshlar va zamonaviy GPS texnologiyalari katta yordam beradi. Tabiiy ofatlarni simulyatsiya qilish va ularga qarshi kurashishda kompyuter modellari yordamida imkoniyatlar va xavflarni prognoz qilish imkoniyatlari mavjud.

Xulosa qilib aytadigan bo‘lsak, tabiiy ofatlar insoniyat uchun katta tahdid hisoblanadi, ammo ularning tarqalishini, oldini olishni va oqibatlarini minimallashtirishni o‘rganish orqali ko‘plab hayotlarni saqlab qolish mumkin. Faqat ilm-fan, texnologiyalar, davlatlararo hamkorlik va mahalliy jamoalarning o‘zaro ishlashi natijasida tabiiy ofatlarga qarshi samarali choralar ko‘rish mumkin.

Bundan tashqari, tabiiy ofatlarni oldini olish va oqibatlarini kamaytirishning eng samarali usuli – bu xabardorlikni oshirish va odamlarni tayyorlashdir.

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AKADEMIK LITSEY VA KASB-HUNAR MAKTABLARIDA GEOGRAFIYA TA'LIMI

Annotatsiya: *Ushbu maqolada geografiya ta'limini akademik litseylarda va kasb-hunar maktablarida o'qitishning maqsadi, metodologiyasi va o'quvchilarga qo'llanilishi mumkin bo'lgan tavsiyalar muhokama qilinadi. Maqola, geografiya o'qitish jarayonini yanada samarali qilish uchun takliflar va tavsiyalarni o'z ichiga oladi.*

Kalit so'zlar: *geografiya ta'limi, akademik litsiya, kasb-hunar maktabi, pedagogika, o'quvchilarga tavsiyalar, ta'lim metodlari, interaktiv o'qitish*

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GEOGRAPHY TEACHING IN ACADEMIC LYCEUMS AND VOCATIONAL SCHOOLS

Abstract: *This article discusses the purpose, methodology and recommendations for teaching geography in academic lyceums and vocational schools, which can be applied to students. The article contains suggestions and recommendations for making the process of teaching geography more effective.*

Keywords: *geography lesson, academic lyceum, vocational school, pedagogy, recommendations to students, teaching methods, interactive teaching*

Kirish: Geografiya darsi, nafaqat tabiiy fanlarni o'rgatish, balki o'quvchilarning umumiy bilim doirasini kengaytirish va ularda tahlil qilish, muammolarni hal qilish kabi ko'nikmalarni rivojlantirishda muhim o'rin tutadi. Akademik litseylarda va kasb-hunar maktablarida geografiyaning o'qitilishi esa turli maqsadlarni ko'zda tutadi. Akademik litseylarda geografiya darsi o'quvchilarga keng dunyoqarash va ilmiy asoslarni berishga qaratilgan bo'lsa, kasb-hunar maktablarida esa geografiyaning amaliy tomonlarini, ayniqsa, kasbiy faoliyatda

foydalaniladigan geografik bilimlarni o'rgatishga urg'u beriladi. Ushbu maqolada geografiya fanining o'qitilish maqsadlari, tavsiyalari va metodlari tahlil qilinadi.

Geografiya darsining akademik litsiyalarda o'qitish maqsadi:

✓ Akademik litseylarda geografiya o'quvchilarga ilmiy va nazariy bilimlarni berish, tabiat va jamiyat o'rtasidagi o'zaro aloqalarni tushuntirish, va geografik fikrlashni rivojlantirishga qaratilgan.

✓ Bu yerda geografiyaning ta'limiy maqsadi o'quvchilarning ilmiy tafakkurini rivojlantirish, turli hududlarning tabiiy resurslarini, iqlimini, iqtisodiy va ijtimoiy sharoitlarini o'rganish, shuningdek, global muammolarni hal qilish uchun asosiy bilimlarni berishdir.

Kasb-hunar maktablarida geografiya darsining maqsadi:

Kasb-hunar maktablarida geografiya amaliy fan sifatida o'qitiladi. O'quvchilarga geografiyaning amaliy jihatlari, masalan, tuproqshunoslik, transport geografiyasi, va tabiiy resurslar bo'yicha bilimlar beriladi.

Geografiya o'qitish metodlari va tavsiyalari:

Interaktiv metodlar: O'quvchilarga geografiyani o'rgatishda interaktiv metodlardan foydalanish, masalan, guruh ishlari, munozaralar, va amaliy mashg'ulotlar, ularning geografik tafakkurini rivojlantirishga yordam beradi.

Zamonaviy texnologiyalarni qo'llash: GIS tizimlari, raqamli xaritalar va boshqa zamonaviy texnologiyalar geografiya darsini yanada qiziqarli va samarali qiladi.

Amaliy ishlar va loyihalar: O'quvchilarga geografiya bo'yicha mustaqil tadqiqotlar va loyihalar bajarishga imkoniyat yaratish, ularning muammolarni hal qilish va taqdimot qilish ko'nikmalarini rivojlantiradi.

Maktab va akademik litsiylarda geografiya darsini samarali o‘tkazish uchun bir qancha metodlardan foydalanish mumkin. Har bir metod o‘quvchilarning bilim olish jarayonini yanada qiziqarli va samarali qilishga yordam beradi. Quyida geografiya darsini o‘tkazishda qo‘llanilishi mumkin bo‘lgan ba'zi metodlar:

Interaktiv metodlar

• Guruh ishlari va munozaralar: O‘quvchilarni kichik guruhlarga bo‘lib, geografik masalalar bo‘yicha munozara qilish, ijtimoiy yoki ekologik masalalar yuzasidan fikr almashish. Bu metod o‘quvchilarning fikrlash, tahlil qilish va o‘z nuqtai nazarini ifodalash ko‘nikmalarini rivojlantiradi.

• Case-study (Holat tahlili): O‘quvchilarga real hayotdagi geografik muammolarni taqdim etib, ular ularni tahlil qilib, yechimlarni topishga harakat qilishlari so‘raladi. Bu metod o‘quvchilarning amaliy ko‘nikmalarini oshiradi.

Loyihaviy metod - O‘quvchilarga mavzu bo‘yicha loyiha yaratish vazifasi beriladi. Masalan, iqlim o‘zgarishi yoki turli hududlarning iqtisodiy rivojlanishi haqida loyiha tayyorlash. Bu metod o‘quvchilarda mustaqil o‘ylash, tadqiqotlar o‘tkazish va topshiriqni yakunlash ko‘nikmalarini rivojlantiradi.

Zamonaviy texnologiyalardan foydalanish:

• GIS (Geografik axborot tizimlari): Zamonaviy texnologiyalar yordamida o‘quvchilar geografik ma'lumotlarni o‘rganishadi, kartalar va xaritalar yordamida turli hududlar haqida ma'lumot oladilar. GIS texnologiyalari yordamida

o‘quvchilarga hududlarning tabiiy resurslarini, iqlimini, transport tizimlarini va boshqalarni o‘rgatish mumkin.

• Virtual ekskursiyalar: Kompyuter va internet imkoniyatlaridan foydalangan holda, o‘quvchilar dunyoning turli burchaklariga virtual sayohat qilishlari mumkin. Bu metod o‘quvchilarga geosiyosiy va ekologik jarayonlarni yaxshiroq tushunishga yordam beradi.

Muvaffaqiyatli o‘qitish uchun o‘yinlar va simulyatsiyalar

• Geografik o‘yinlar: O‘quvchilarni o‘yin orqali o‘rgatish, masalan, xarita tuzish, yer yuzasining turli shakllarini aniqlash yoki tabiiy resurslarni boshqarish. Bunday o‘yinlar o‘quvchilarga geografik bilimlarni amaliy ravishda o‘rganishga yordam beradi.

• Simulyatsiya va ro'l o‘ynash: O‘quvchilarni turli ijtimoiy va iqtisodiy sharoitlarda qanday qarorlar qabul qilishlarini simulyatsiya qilish. Bu metod o‘quvchilarni mas'uliyatli qarorlar qabul qilishga, global muammolarga yechim topishga o‘rgatadi.

Aqliy xarita (Mind map) yaratish - O‘quvchilarga mavzu bo‘yicha aqliy xarita yaratish vazifasi beriladi. Bu metod yordamida ular geografik tushunchalar va mavzularni bog‘lashadi, ya'ni o‘rganilgan bilimlarni tizimlashtirishadi. Bu usul, o‘quvchilarning eslab qolish va mantiqiy fikrlash ko‘nikmalarini rivojlantiradi.

Amaliy mashg‘ulotlar: Poligon ishlari: O‘quvchilarga haqiqiy yer yuzasida yoki sinfda turli kartografik ishlarni bajarishga imkoniyat yaratish. Masalan, xarita tuzish, masofa o‘lchash yoki geografik nuqtalarni belgilash.

• Tabiiy hodisalar yoki ekosistemalarni tahlil qilish: O‘quvchilarga ekologik yoki tabiiy hodisalar haqida tahlil qilishni o‘rgatish. Bu, o‘quvchilarga geografiyani nafaqat nazariy, balki amaliy ravishda o‘rgatishga yordam beradi.

• *Kartalar va xaritalar yordamida o‘rgatish*: Geografik ma'lumotlarni vizual tarzda taqdim etish o‘quvchilarning yaxshiroq tushunishini ta'minlaydi. Kartalar, diagrammalar, infografikalar va boshqa vizual materiallar geografik jarayonlarni va xususiyatlarni o‘rgatishda samarali yordam beradi.

• *Rasmli materiallar:* Tabiat, iqlim, shahar va qishloq joylarining rasmli ko‘rinishlari orqali mavzularni o‘rgatish o‘quvchilarning tasavvurini kengaytiradi.

• O‘quvchilarga turli geografik muammolarni, masalan, iqlim o‘zgarishi yoki ekologik buzilishlarni tahlil qilish va muhokama qilishni taklif etish. Bu metod o‘quvchilarning fikrlash va o‘z nuqtai nazarlarini asoslash ko‘nikmalarini rivojlantiradi.

Xulosa: Geografiya darsini akademik litseylarda va kasb-hunar maktablarida o'qitish, o'quvchilarning nafaqat ilmiy bilimlarini, balki amaliy ko'nikmalarini ham rivojlantirishga xizmat qiladi. Akademik litseylarda geografiya o'quvchilarning umumiy dunyoqarashini kengaytirish, ekologik va ijtimoiy masalalar bo'yicha ongini shakllantirishga yordam beradi. Kasb-hunar maktablarida esa geografiya, o'quvchilarga o'z kasblarida foydalanadigan amaliy bilimlarni berishga qaratilgan. Zamonaviy pedagogik usullar, interaktiv metodlar va texnologiyalarni qo'llash, geografiya darslarini yanada samarali va qiziqarli qilishga yordam beradi. O'qitish

jarayonini yanada takomillashtirish uchun pedagoglarga yangicha yondashuvlar va metodlarni qo'llash tavsiya etiladi.

Ushbu maqola geografiya darslarini akademik litseylarda va kasb-hunar maktablarida samarali o'qitish bo'yicha ilmiy va amaliy tavsiyalarni o'z ichiga oladi, shuningdek, geografiyaning ta'limdagi o'rni va o'quvchilarga beradigan foydalari haqida umumiy tasavvur yaratadi.

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MOBIL ILOVALAR ORQALI BIOLOGIYANI MUSTAQIL O’RGANISH USULLARI

Annotatsiya: *Zamonaviy ta’lim tizimi axborot texnologiyalarining keng qo‘llanilishi bilan ajralib turadi. Bugungi kunda raqamli vositalar, xususan, mobil ilovalar ta’lim jarayonining muhim qismiga aylanib bormoqda. Biologiya fanini o‘rganishda ham mobil ilovalardan foydalanish o‘quvchilar va talabalarning mustaqil bilim olish ko‘nikmalarini rivojlantirishga xizmat qiladi.*

Mobil qurilmalar orqali ta’lim oluvchilar istalgan vaqtda, istalgan joyda ta’lim olish imkoniyatiga ega bo‘ladilar. Bu esa ta’limning uzluksizligi va samaradorligini oshirishga yordam beradi. Ayniqsa, biologiya fanida murakkab tushunchalar, jarayonlar va tajribalarni tushuntirishda vizual va interaktiv vositalar muhim ahamiyatga ega. Mobil ilovalar aynan shu jihatlari bilan afzallik kasb etadi.

Mazkur maqolada biologiyani mustaqil o‘rganishda mobil ilovalardan foydalanishning metodik asoslari, ularning ta’lim oluvchilar bilim darajasiga ta’siri hamda samaradorlik darajasi tahlil qilinadi. Shuningdek, mavjud mobil ilovalar tahlili va ularning afzalliklari, kamchiliklari o‘rganiladi.

Kalit so'zlar: *Mobil qurilmalar, individual yondashuv, axborot texnologiyalari, mustaqil bilim olish ko‘nikmalari, ta'lim va tarbiya, biologiya.*

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METHODS OF INDEPENDENT LEARNING OF BIOLOGY THROUGH MOBILE APPLICATIONS

Annotation*: The modern education system is characterized by the widespread use of information technologies. Today, digital tools, in particular, mobile applications, are becoming an important part of the educational process. The use of mobile applications in studying biology also serves to develop the skills of independent learning of pupils and students.*

Through mobile devices, learners have the opportunity to receive education at any time and anywhere. This helps to increase the continuity and efficiency of education. Visual and interactive tools are especially important in explaining complex concepts, processes and experiments in biology. Mobile applications have advantages in these aspects.

This article analyzes the methodological foundations of the use of mobile applications in independent learning of biology, their impact on the level of knowledge of students and their level of effectiveness. Also, an analysis of existing mobile applications and their advantages and disadvantages are studied.

***Keywords**: Mobile devices, individual approach, information technologies, independent learning skills, education and upbringing, biology.*

Kirish. Hozirgi kunda mobil texnologiyalar va ilovalar ta'lim tizimida muhim o'rin egallamoqda. O'quv jarayonining samaradorligini oshirishda mobil ilovalar yordamida biologiyani o‘rganishning salmoqli ahamiyati bor. Biologiya fani murakkab bo‘lishi sababli, mobil ilovalar yordamida mustaqil o‘rganish o‘quvchilarga darslarni ko‘proq qiziqarli, interaktiv va samarali tarzda o‘zlashtirish imkonini beradi. Bu esa biologiya faniga bo‘lgan qiziqishni oshirib, uning mazmunini to‘liq va chuqur o‘rganishga yordam beradi.

Zamonaviy ta’lim jarayonida mobil texnologiyalardan foydalanish nafaqat o‘quvchi va talabalarning bilimga bo‘lgan qiziqishini oshiradi, balki ularning mustaqil o‘rganish ko‘nikmalarini shakllantirishda ham muhim omilga aylanmoqda. Ayniqsa, biologiya fanini o‘zlashtirishda mobil ilovalar orqali o‘rganish usullarining joriy etilishi bu boradagi yangicha metodik yondashuvlarni shakllantirish imkonini beradi. Mobil ilova (inglizcha: *Mobile app*) — ma’lum bir platforma (iOS, Android, Windows Phone va boshqalar) uchun ishlab chiqilgan smartfonlar, planshetlar va boshqa mobil qurilmalarda ishlashga mo‘ljallangan dastur. Ko‘pgina mobil ilovalar qurilmaning o‘zida oldindan o‘rnatiladi yoki ularni App Store, Google Play va boshqalar kabi onlayn dastur do‘konlaridan bepul yoki pullik yuklab olish mumkin[1].

Dastlab, mobil ilovalar elektron pochtani tezda tekshirish uchun ishlatilgan, ammo ularning yuqori talablari boshqa sohalarda ham kengayishiga olib keldi, masalan, mobil telefon va GPS o‘yinlari, suhbatlashish, video tomosha qilish va Internetdan foydalanish[3].

Ushbu atama 2007-yildan beri juda mashhur bo‘lib, 2010-yilda Amerika Dialektik Jamiyati tomonidan „Yil so‘zlari“ ro‘yxatiga kiritilgan.

Mobil ilovalar bozori bugungi kunda juda rivojlangan va barqaror o‘sib bormoqda. Statista prognozlariga ko‘ra, 2020-yilda mobil ilovalar sanoatining yillik yalpi daromadi $189 milliarddan oshadi[8].

exnologiyalari)dan foydalanishning samaradorligi, o‘quvchilarda mustaqil fikrlash va analiz qilish ko‘nikmalarini shakllantirishga doir tadqiqotlar olib borgan.

Yusupova M.T. – biologiya fanidan masofaviy va raqamli ta’lim usullarining pedagogik asoslarini yoritgan.

Xaydarov F. – o‘rta va oliy ta’lim tizimida zamonaviy pedagogik texnologiyalarni, xususan mobil o‘qitish ilovalarini qo‘llash bo‘yicha ilmiy izlanishlar muallifi.hisoblanadi[3].

Quyida biologiya bo‘yicha mashhur mobil ilovalarbilan tanishamiz:

1.1. KhanAcademy(1-rasmga qarang):

1-rasm

1-rasm. KhanAcademy mobil ilova.

Biologiya fanining asosiy tushunchalarini va mavzularini qisqacha va tushunarli tarzda taqdim etadigan bepul platforma. Talabalar biologiyaning turli yo‘nalishlari, masalan, hujayra strukturasidan tortib, ekologiyaga qadar bo‘lgan barcha bo‘limlarni o‘rganishlari mumkin. Khan Academy-bu notijorat ta'lim platformasi bo'lib, uning asosiy maqsadi har kimga, yordamga, bepul va yuqori sifatli ta'limni taqdim etishdir. Ushba platformasi 2008-yilda Salman Khan tashkil etilgan. Khan Academy veb-sayti orqali turli fanlardan, jismoniy matematika, biologiya, fizika, kimyo, informatika, tarix va boshqa yo'nalishlar bo'yicha videodarslar, interaktiv materiallar, testlar va o'quv materiallari taqdim etish.

Khan Academy bilan bog'liq holda turadi:

- **Bepul ta'lim:** Barcha kontentdan yuklab olish bepul bo'lib, o'tgan holda ro'yxatdan o'tmasdan yoki ro'yxatdan o'tish orqali ham yuborish mumkin.
- **Interaktiv darslar:** Video darslardan tashqari, har bir mavzuni uchun testlar va asboblar mavjud.
- **Moslashuvchanlik:** Talabalar o'rganish jarayonida o'rganish mumkin, ya'ni har bir darsni xohlagancha qayta ko'rish mumkin.
- **Ko'p tillilik:** asosiy darslar ingliz tilida bo'lsa-da, ko'plab darslar boshqa tillarga, o'zbek tiliga ham qilinmoqda.
- **Ota-o'qituvchilar uchun kuzatuv onalar va o'qituvchilarning** o'quvchilarini kuzatib borishlari va ularga individual yordam ko'rsatishlari mumkin.

Khan Academy bugungi kunda butun dunyo bo'ylab millionlab o'quvchilar uchun ishonchli va samarali onlayn o'quv manbaiga aylangan. Shu tufayli, u mobil yordam biologiyani mustaqil o'rganishda ham muhim moddalardan biri bo'lib xizmat qiladi[6].

2. BioManBiology(2-rasm).

2-rasm

2-rasm. KhanAcademy mobil ilova.

Biologiya fanidagi asosiy konseptlarni o‘rgatish uchun interaktiv o‘yinlar va testlarni taqdim etadigan ilova. Bu o‘yinlar o‘quvchilarga qiziqarli tarzda biologiya fani bo‘yicha bilim olish imkoniyatini yaratadi. BioMan Biology — bu biologiya fanini interaktiv tarzda o'rganishga mo'ljallangan bepul onlayn ta'lim platformasi va mobil ilova bo'lib, o'quvchilarga biologiyani o'yinlar, viktorinalar, simulyatsiyalar va boshqa qiziqarli harakatlar orqali mustaqil o'rganish yaratadi.

Ilovaning asosiy maqsadi:

➢ Biologiyani o'quvchilar uchun tushunarli, qiziqarli va interaktiv tarzda o'rgatish.

➢ Talabalar va o'qituvchilarga biologiya fanining turli bo'limlarini yordam berish.

➢ Mustaqil tadqiqot va bilimni o'rganishni rivojlantirish.

Ilovadagi asosiy funktsiyalar:

✓ **O'yinlar:** Har bir bo'lim uchun alohida biologik o'yinlar mavjud (masalan, hujayra tuzilishi, DNK, tabiiy tan va hk).

✓ **Viktorinalar (** Tematik testlar orqali bilimni sinash Quizzes).

✓ **Video darsliklar:** Tushunishni osonlashtirish uchun qisqa video kontentlar.

✓ **Simulyatsiyalar:** biologik jarayonlarni vizual tarzda ko'rish va o'rganish.

✓ **Scaffolded Learning:** Qadam-baqadam o'rgatish usuli bilan bilimlar tizimli tarzda yaratilgan.

3. Anatomy3D(3-rasm):

3-rasm

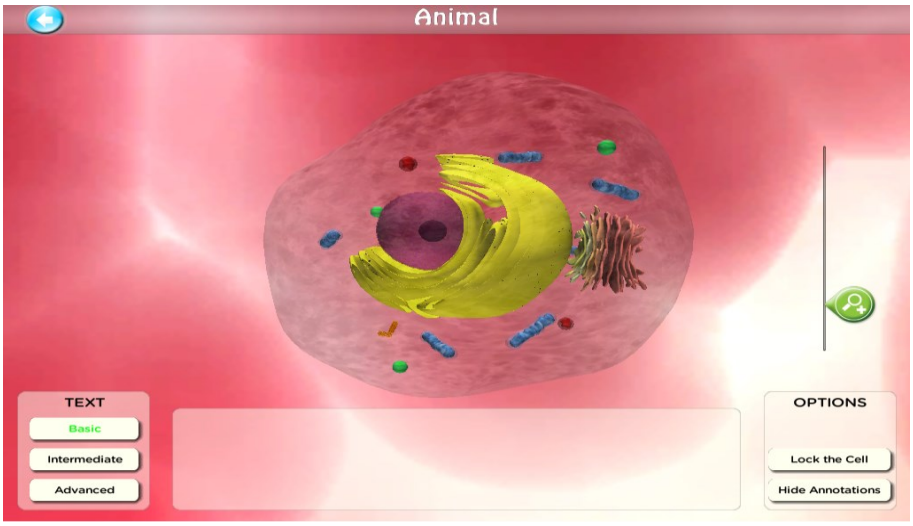
3-rasm. Anatomy3D mobil ilova

Inson anatomiyasini o‘rganishga qaratilgan 3D model yordamida ishlaydigan ilova. Bu ilova o‘quvchilarga har bir organ va tizimning strukturasini mukammal tushunishga yordam beradi. Anatomy 3D — bu inson anatomiyasini vizual va interaktiv usulda o'rganish yordamida mobil va kompyuter ilovasidir. Ush ilova tibbiy ta'lim, biologiya fani, hamshiralik, fizioterapiya va boshqa sog'liqni saqlash yo'nalishlarida tahsil olayotgan talabalar uchun mo'ljallangan. Ilova 3D texnologiya asosida ishlab bo'lib, inson tanasining murakkab tuzilmalarini realistik, hajmli

ko'rinishda namoyish etadi. Anatomik tuzilmalarni oddiy, tushunarli va interaktiv tarzda o'rgatish orqali o'quvchilarning biologik bilimlarini tuzatib, vizual xotirani faollashtirish. Ilova orqali, suyaklar, organlar qon tizim tizimi, asab tizimi kabi tizimlar 360° aylantirilgan va tahlil qilingan holda ko'chirish. Interaktivligi shundan iboratki- Har bir tuzilmani bosib, undan nomi, va tuzilishi haqida qisqacha ma'lumot mahsulot.Ilova orqali tana bo'limlarga ajratilgan o'rganish mumkin. Tana qismlari bo'yicha (bosh, bo'yin, ko'krak, qorin, qo'l-oyoq) modellar alohida ko'rib chiqiladi. Ba'zi versiyalarida tayyor darslar viktorinalar va bilimni tekshirishchi testlar mavjud[7]. 3D ko'rinishlar o'quvchilarning materialni tez va puxta o'zlashtirishga yordam beradi. Foydalanishga qulay interfeys. Har bir foydalanuvchi uchun oddiy va tushunarli tizim menyu mavjud. Masofaviy ta'limga juda mos ilova masofadan turib o'rganish uchun ham qulay vosita. 3D anatomiya ilovalari orqali o'qitish an'anaviy kitob va jadval asosida o'rgatishga nisbatan o'quvchilarda ancha yuqori shuni va eslab qolish ko'rsatkichlariga olib keladi. texnologiyalar, zamonaviy texnologiyalar bilan o'qitilayotgan talabalarda fanga yuqori darajadagi kuchayadi. Anatomiya 3D ilovasi biologiya va fanlarni o'rganishda zamonaviy, samarali va interaktiv vosita sifatida keng qo'llanilmoqda. Bu kabi bilish texnologiyalari bilimlarini chuqurroq hamda egallash, mustaqil o'z ko'rinishini rivojlantirish vizual tafakkurni ishlab chiqarishda katta ega.

4. iCell(2.2.5-rasm):

4-rasm



4-**rasm.** iCell mobil ilovasi**.**

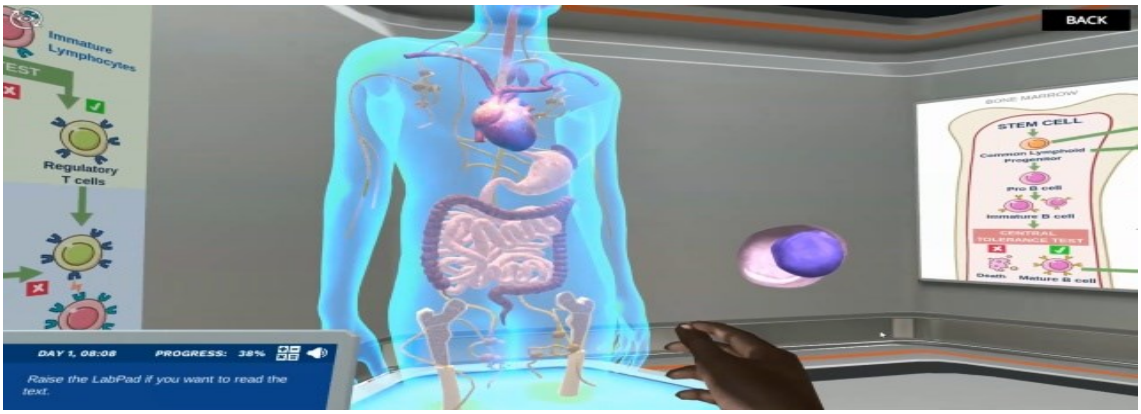
Hujayra strukturasini va uning turli organellalarini o‘rganishga mo‘ljallangan mobil ilova. iCell — bu HudsonAlpha Biotexnologiya instituti tomonidan ishlab chiqarish bepul ta'limiy mobil bo'lib, foydalanuvchilarga ilovalar va uning turli organellalarini uch o'lchamli (3D) shaklda o'rganishni beradi. Ilova biologiya faniga ixtisoslashgan o'quvchilar, talabalar, o'qituvchilar va ilmiy tadqiqotlar uchun

mo'ljallangan bo'lib, ayniqsa hujayra biologiyasi bo'limini interaktiv va vizual o'rganishda samarali vositalar. Qo'shimcha ichki hujayralar yordamida yaqinlashtirishi, va alohida ko'rib chiqishi mumkin. Har bir organella (masalan, yadrosi, mitoxondriya, ribosoma, vakuola va boshqalar) yuk bosilganda, uning nomi va funksiyasi haqida qisqacha hosil chiqadi. Ilova uchta turli matnli izoh beradi taklif qiladi:

Tajriba vositalariga va foydalanuvchi mulohazalariga ko'ra, iCell ilovasi o'quvchilarning hujayra biologiyasi bo'yicha bilimlarini samaralilab, murakkab murakkab tushunarli va qiziqarli hosillarni ishlab chiqarishga xizmat qiladi. yana, 3D ko'rinishdagi hujayra tuzilmasi orqali ta'lim jarayoni vizual va intuitiv tarzda olib boriladi, bu esa o'quvchilarni biologiyaga nisbatan ko'proq qiziqtiradi. Quyidagi havolalar orqali yuklab olish mumkin**: Kompyuter yoki brauzer versiyasi** : https://icell.hudsonalpha.org.

5.Labster(5-rasm):

5-rasm.



5-rasm. Labster mobil ilovasi.

Virtual laboratoriya muhitida biologik eksperimentlarni o‘tkazish imkonini beruvchi ilova. Labster virtual laboratoriya muhitida biologik , fizika va boshqa fanlar bo'yicha intera— virtual bu laboratoriya muhitida biologik, fizika va boshqa fanlar bo'yicha interaktiv eksperimentlarni o'tkazishga mo'ljallangan innovatsion ta'lim platformasi. Ush ilova dasturlari real laboratoriya sharoitlarisiz kompyuter yoki mobil qurilmalar orqali turli fanlardagi amaliy mashg'ulotlarni samarali va samarali imkoniga ega bo'ladilar. Labster platformasi 3D grafikalar asosida haqiqiy laboratoriya muhitini taqdim etadi, bu yerda turli xil kimyoviy tajribalarni simulyatsiya qiladi. Masalan, hujayra biologiyasi, genetik tadqiqot, biokimyo va mikroskopiya kabi sohalarda amaliy mashg'ulotlar o'tkazish mumkin. Samarasi eksperiment jarayonidagi barcha tahlillarni o'zgartirishlar: reaktivlar, asboblarni sozlash, kuzatuv o'tkazish va boshqarishni qilishdir.

Labster o'qituvchilari va talabalar uchun mo'ljallangan dastur bo'lib, individual o'rganishdan tortib, sinfda birlashtirib ishlab chiqarishga yordam beradi. Har qanday yordam va testlarni taklif qiladi. Labster platformasi onlayn rejimda ishlaydi, ammo ba'zi resurslar oflayn yuklash uchun foydalanish mumkin. Ilovaning virtual laboratoriya muhiti talabalarni eksperiment jarayonining amaliy yordami bilan tanishtirishda, nazariy bilimlarni quvvatda va o'rganish motivatsiyasini

aniqlashda samarali vosita. Tadqiqotlar shuni ko'rsatadigan laboratoriya orqali o'rganish, Labster o'rganish ananaviy mashg'ulotlariga nisbatan ko'proq interaktiv va qiziqarli bo'lib, talabalar o'rganish natijalarini yaxshilaydi. Labster ilovasidan foydalanish uchun maxsus kurslar, darsliklar va testlar mavjud bo'lib, ular oquv jarayonini yanada boyitadi. Platforma turli xil ta'lim va universitetlarda keng qo'llaniladi.

Xulosa qiladigan bo’lsak mobil ilovalar yordamida biologiya fani o‘rganishning ahamiyati va o‘ziga xos jihatlaridan biri shundaki biologiyani o‘rganishning samaradorligi ta'lim jarayonini ancha osonlashtiradi va intensivlashtiradi. Mobil texnologiyalar ta'limning yangi imkoniyatlarini yaratadi, o‘quvchilar va talabalarga mustaqil ravishda, o‘z vaqtida va joyida o‘rganish imkoniyatini beradi. Biologiya fani kabi murakkab fanlarni o‘rganishda mobil ilovalar yordamida Talabalarning qiziqishini oshirish va bilimlarini samarali tarzda mustahkamlash mumkin

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RAQAMLI TEXNOLOGIYALARNING YASHIL IQTISODIY O‘SISHDAGI ROLI: O’ZBEKISTON VA JAHON TAJRIBASI

Annotatsiya: *Ushbu maqolada 2020-yildan keyingi tadqiqotlar tahlil qilinib, sun’iy intellekt (AI), IoT, katta ma’lumot (big data), blokcheyn va raqamli platformalar kabi texnologiyalarning yashil iqtisodiy o‘sishga ta’siri ko‘rib chiqiladi. Raqamli iqtisodiyot va yashil iqtisodiy o‘sish tushunchalariga izoh berilib, ular o‘zaro bog‘liqligi misollar bilan tushuntiriladi. Jahon tajribasi va O‘zbekistondagi misollar (masalan, quvvat tejamkor sug‘orish tizimlari, yashil superkompyuter markazlari) yoritiladi.*

Kalit so‘zlar: *raqamli texnologiyalar, yashil iqtisodiy o‘sish, barqaror rivojlanish, raqamli iqtisodiyot, sun’iy intellekt, IoT, blokcheyn.*

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THE ROLE OF DIGITAL TECHNOLOGIES IN GREEN ECONOMIC GROWTH: THE EXPERIENCE OF UZBEKISTAN AND THE WORLD

Abstract: *This article reviews post-2020 studies on the impact of technologies such as artificial intelligence (AI), the Internet of Things (IoT), big data, blockchain, and digital platforms on green economic growth. It explains the concepts of digital economy and green growth, illustrating their interconnection with real-world examples. Global experiences and Uzbekistan-based initiatives (such as energy-efficient irrigation systems and green supercomputer centers) are highlighted*

Keywords: *digital technologies, green economic growth, sustainable development, digital economy, artificial intelligence, IoT, blockchain*

Kirish

Yashil o‘sish bu iqtisodiy o‘sish va rivojlanishni rag‘batlantirib, tabiiy aktivlarning resurs va atrof-muhit xizmatlarini uzluksiz ta’minlash demakdir (OECD, 2024). Raqamli texnologiyalar atamasi esa sun’iy intellekt (AI), Internet buyumlari (IoT), katta ma’lumot (Big Data), bulutli hisoblash, blokcheyn va turli onlayn platformalarni o‘z ichiga oladi. Bu texnologiyalar barqaror rivojlanish maqsadlariga erishishda muhim omil bo‘lib xizmat qilishi mumkin. Masalan, AQSh va Yevropa Ittifoqi turli hisob-kitob tizimlar, aqlli texnika va raqamli infratuzilmalar yordamida energiya tejamkorligini oshirish, chiqindilarni kamaytirish va erkin axborot oqimini ta’minlash orqali yashil yo‘nalishda qo‘shimcha imkoniyatlar yaratilishini ko‘rsatgan (Stern et al., 2025; Caira et al., 2024).

O‘zbekistonda ham raqamli iqtisodiyot va yashil iqtisodiyot strategiyalarini bir vaqtda rivojlantirishga qaratilgan bir necha qarorlar va farmonlar qabul qilingan. 2020-yil oktabrda Prezident farmoni bilan tasdiqlangan “Raqamli O‘zbekiston – 2030” strategiyasi mamlakatni raqamli transformatsiya yo‘lida rivojlantirishni maqsad qilgan. Shu bilan birga, 2022–2023 yillarda O‘zbekiston Respublikasi Qoraqalpog‘iston Jo‘qorg‘i Kengashi va Vazirlar Mahkamasining qarorlari bilan yashil iqtisodiyotga o‘tish bo‘yicha milliy strategiya qabul qilindi (Maxammadiyev and Mirzaxalilov, 2025). Ushbu strategiyalar mamlakatni “yashil” energiya manbalariga o‘tish, ekologik toza ishlab chiqarish va axborot-kommunikatsiya texnologiyalarini rivojlantirishga yo’naltiradi. Shuning uchun O‘zbekiston raqamli texnologiyalarning yashil iqtisodga ta’siri nuqtai nazaridan qulay misol sifatida xizmat qiladi.

Adabiyotlar tahlili

Global tadqiqotlar sun’iy intellekt, IoT va katta ma’lumot kabi raqamli texnologiyalar energiya tizimlari samaradorligini oshirishda muhim rol o‘ynashini ko‘rsatadi (Stern et al., 2025; Caira et al., 2024). Masalan, Stern va boshqalar (2025) ta’kidlashicha, SI insoniyatning iqlim bilan bog‘liq muammolarni hal qilishni tezlashtirib, barqaror va inklyuziv iqtisodiy o‘sishni qo‘llab-quvvatlaydi. OECD tahlillariga ko‘ra, SI asosidagi raqamli egizak (digital twin) va aqlli sensorlar energiya va resurslardan samarali foydalanishda yordam beradi, shuningdek, virtual uchrashuvlar orqali yo‘l xarajatlarini kamaytirilib, atrof-muhitga salbiy ta’sirni kamaytirishi mumkin (Caira et al., 2024). Big Data va IoT qishloq xo‘jaligida karbon emissiyasini monitoring qilish va resurslarni boshqarish uchun ishlatilmoqda. Misol uchun, Ahmed va Shakoorning (2025) ilmiy izlanishiga ko’ra zamonaviy qishloq xo‘jaligida IoT, Big Data va SI orqali chiqindilarni kuzatish, hosilni optimallashtirish va ekologik zararni kamaytirish mumkin(Ahmed and Shakoor, 2025). Shuningdek blokcheyn texnologiyasi karbon krediti savdosi va ta’minot zanjiri shaffofligi uchun imkoniyatlar yaratmoqda. Wang va boshqalar (2022) tadqiqotida ta’kidlanganidek, blokcheyn texnologiyasi raqamli tizimlarga xos ekologik tizimlarni shaffoflashtirish va samaradorlikni oshirishga imkon beradi (Wang et al., 2022). Mahalliy tadqiqotlar ham raqamli texnologiyalarning yashil iqtisodiyotga ta’sirini atroflicha o‘rganib chiqildi. Maxammadiyev va Mirzaxalilov (2025) O‘zbekistonda sun’iy intellekt, IoT, katta ma’lumotlar, bulutli texnologiyalar va blokcheyn kabi innovatsion texnologiyalar energiya samaradorligini oshirish, uglerod emissiyasini kamaytirish va chiqindilarni optimallashtirishda muhim o‘rin tutishi aniqlagan. Shunga o‘xshash tarzda, Shodmonov va Mustafakulov (2025)ning tahlillariga ko‘ra IoT, SI, avtonom tizimlar va katta ma’lumot sanoat tarmoqlarida energiya samaradorligi va resurslardan unumli foydalanishni sezilarli darajada oshiradi. Ammo, ikkala tahlil mualliflari ham O‘zbekistonda raqamli infratuzilmaning yaxshi rivojlanmaganligi, investitsiya kamligi va texnologik kadrlar tayyorlashdagi muammolar yashil iqtisodiy o’sish va raqamli iqtisodiyot rivojiga katta to‘sqinlik qilishi qayd etilgan (Maxammadiyev va Mirzaxalilov, 2025; Shodmonov va Mustafakulov, 2025).

Metodologiya

Ushbu tadqiqot uchun 2020-yildan keyingi ilmiy maqolalar va rasmiy hisobotlardan iborat 5–7 manbalar tanlandi. Maqolalar, Scopus, Web of Science kabi ma’lumotlar bazalaridan va O‘zbekiston davlat strategiyalari matnlaridan olingan. Tanlangan manbolar mavzuga mosligi, sifat va ishonchliligi bo‘yicha saralandi. Olingan adabiyotlar mazmunini sifatli analiz (qualitative) usuli yordamida tahlil qilindi. Xususan, har bir manbadagi raqamli texnologiyalar va yashil iqtisod o‘rtasidagi bog‘liqlik mavzulari yoritilib, umumiy mavzular (energiya samaradorligi, ekologik monitoring, investitsion imkoniyatlar) bo‘yicha guruhlab tahlil qilindi.

Natijalar

Raqamli texnologiyalar sanoat va kommunal sohalarda energiya iste’molini optimallashtirish va chiqindilarni kamaytirishda qo‘llanilmoqda. Masalan, sun’iy intellekt va smart sensor tizimlari orqali elektr tarmoqlaridagi yo‘qotishlar kamaytirilishi, binolar va fabrikalarda energiya tejash darajasi oshirilishi mumkin. Shuningdek, IoT va katta ma’lumot yordamida ishlab chiqarish liniyalarining ishlashi optimallashtirilib, chiqindilar miqdori kamayadi.Virtual uchrashuv platformalari va masofaviy boshqaruv tizimlari esa transport xarajatlarini kamaytirib, umumiy karbon emissiyasini pasaytiradi. Raqamli qurilmalar va tahlil yordamida chiqindilarni real vaqtda monitoring qilish, havo sifati va boshqa ekologik parametrlarni kuzatish mumkin. Masalan, qishloq xo‘jaligida IoT qurilmalari o‘simliklar holatini kuzatib, ortiqcha suv sarfini oldini olish va amaldagi ish rejimini ekologik nuqtai nazardan “toza” qilish imkonini beradi. Blokcheyn texnologiyasi esa karbon kreditlarini shaffof savdoga kiritish va resurslardan samarali foydalanishning mexanizmlarini yaratishga xizmat qiladi. Raqamli moliyaviy xizmatlar — masalan, fintech platformalari va onlayn-pul o‘tkazmalar orqali yashil loyihalarga mablag‘ jalb qilish osonlashmoqda. Xalqaro tajribalarda mobil moliya xizmatlari qayta tiklanadigan energiya texnologiyalariga investitsiyalarni oshirishga xissa qo‘shayotgani qayd etilgan. Internet platformalari atrof-muhit loyihalariga kichik investitsiyalarni keng odamlar guruhiga ulash imkoniyatini beradi va yashil sarmoyalarni ko‘paytirishga yordam beradi.

Muhokama

O‘zbekiston sharoitida adabiyotlarda e’tirof etilgan raqamli texnologiyalarning afzalliklari (energiya tejalishi, investitsiya imkoniyatlari) mamlakat siyosatida aks etishi zarur. Masalan, avtomatlashtirilgan tarmoqlar va aqlli o’lchash (smart metering) tizimlari elektr energiyasi sarfini kamaytirishi mumkin, bu esa davlatning ekologik maqsadlariga erishishda yordam beradi. Biroq tadqiqotlarga ko‘ra, yirik muammolar qatorida raqamli infratuzilmaning eskiligi va investitsiya yetishmovchiligi ajralib turadi. Shodmonov va Mustafakulov (2025)ning xulosasiga ko‘ra, O‘zbekiston sanoatida eskirgan inshootlar, raqamli infrastrukturaning yetishmasligi va mos keluvchi me’yoriy-huquqiy bazaning zaifligi eng muhim to‘siqlardandir.

Shuningdek, ma’lumot markazlari va serverlarga bo‘lgan ehtiyoj ortishi elektr energiyasi iste’molini keskin oshirishi mumkin. OECD hisobotiga ko‘ra,

ayrim mamlakatlarda ma’lumot markazlari qurilishi elektr bozoridagi qiyinchiliklari sababli to‘xtatilgan holatlar mavjud. Bu O‘zbekistonda yangi ma’lumot markazlarini rejalashtirishda ehtiyotkorlikni talab qiladi. Qishloq hududlarida internet va mobil signal qamrovi yetishmasligi ham raqamli yechimlardan foydalanishda tabaqalashtirishni keltirib chiqarishi mumkin. Shu bois, qonun ishlab chiqishda xalqaro tajribadan kelib chiqqan holda raqamli tengsizlik va ekologik omillarni hisobga olish lozim. Muhim tavsiya shundan iboratki, raqamli transformatsiya va yashil strategiyalar integratsiyasi kuchaytirilishi kerak. Ya’ni, birdek muvofiqlashtirilgan harakatlar O‘zbekistonda ijtimoiy, iqtisodiy va yashil o‘sishni jadallashtiradi.

Xulosa

Tahlillar shuni ko‘rsatadiki, raqamli texnologiyalar — SI, IoT, katta ma’lumot va blokcheyn— yashil iqtisodga o‘tishda muhim vosita hisoblanadi. Ular orqali energetika, sanoat va qishloq xo‘jaligida resurslardan samaraliroq foydalanish, chiqindilarni minimallashtirish va qarorlar qabul qilish jarayonlarini yaxshilash mumkin. O‘zbekistonda ham ushbu imkoniyatlarni qo‘llash uchun mos siyosat va infratuzilma zarur. Bugungi kunda mamlakatimizda raqamli infratuzilma va yashil indikatorlar o‘rtasida aniq tahliliy bog‘lanishlarni baholovchi tadqiqotlar kam. Kelajakda mamlakatimizda raqamli va yashil transformatlarni birgalikda o‘rganadigan keng qamrovli tadqiqotlar o‘tkazilishi lozim. Xususan, **raqamli texnologiyalar samarasini baholash** bo‘yicha tadqiqotlar amalga oshirilishi tavsiya etiladi. Bu orqali O‘zbekistonda raqamli texnologiyalarning energiya tejash, emissiyani kamaytirish va yashil iqtisodiy o‘sishga qo‘shgan aniq hissasi aniqlanishi mumkin.

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MAKTABGACHA YOSHDAGI BOLALARNING NUTQINI ERTAKLAR ASOSIDA RIVOJLANTIRISH

Annotatsiya: *Mazkur maqolada maktabgacha yoshdagi bolalarning og‘zaki nutqini shakllantirishda ertaklarning o‘rni va ahamiyati chuqur tahlil qilinadi. Ertaklar bolaning dunyoqarashi, estetik didi va ijodiy tafakkurini rivojlantirish bilan bir qatorda, uning so‘z boyligini kengaytirish, grammatik tuzilmalarni o‘zlashtirish hamda muloqot ko‘nikmalarini shakllantirishda muhim vosita bo‘lib xizmat qiladi. Maqolada ertaklarni pedagogik jarayonga to‘g‘ri va maqsadga muvofiq qo‘shish usullari, shu orqali bolalarning muloqotga kirishish qobiliyatini rivojlantirishga qaratilgan metodik yondashuvlar yoritilgan. Shuningdek, ertaklar vositasida bolaning emotsional holati, hissiy dunyosi va axloqiy fazilatlari ham tarbiyalanishi mumkinligi ta’kidlanadi. Tadqiqotda bolalarning yoshi, psixologik holati va individual xususiyatlariga mos ravishda ertaklarni tanlash bo‘yicha tavsiyalar ham keltiriladi.*

Kalit so‘zlar: *Dialogik nutq, maktabgacha ta’lim, og‘zaki nutqni rivojlantirish, kommunikativ kompetensiya, interfaol metodlar, innovatsion yondashuvlar, so‘z boyligi, milliy qadriyatlar, barkamol shaxs.*

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DEVELOPING SPEECH OF PRESCHOOL CHILDREN THROUGH FAIRY TALES

Annotation: *This article provides an in-depth analysis of the role of fairy tales in developing the oral speech of preschool-aged children. Fairy tales serve not only to enhance children's vocabulary and grammatical understanding but also contribute significantly to their imagination, aesthetic appreciation, and creative thinking. The author presents pedagogical strategies for the effective integration of storytelling into the early childhood education process, with a focus on fostering children's communication skills. Additionally, the article highlights how fairy tales can influence a child's emotional well-being, moral development, and overall personality growth. Recommendations are also provided on selecting appropriate tales based on the child's age, psychological state, and individual characteristics.*

Keywords: *Dialogic speech, preschool education, oral speech development, communicative competence, interactive methods, innovative approaches, vocabulary enrichment, national values, holistic personality development.*

KIRISH. Bugungi raqamlashtirish jarayoni tobora kuchayib borayotgan bir davrda, bolalarda ogʻzaki nutqni rivojlantirish, samarali muloqot koʻnikmalarini shakllantirish, ularni ijtimoiy hayotga tayyorlash hamda milliy va maʼnaviy qadriyatlarni singdirish orqali ijtimoiy ong va kommunikativ kompetensiyani yuksaltirish muhim vazifalardan biri sanaladi. Ayniqsa, bu jarayonda ertaklardan foydalanish — bolalarning tasavvuri, estetik dunyoqarashi va soʻz boyligini rivojlantirishda muhim metodik vosita hisoblanadi. Shu nuqtai nazardan qaraganda, maktabgacha taʼlimning katta yosh bosqichidagi bolalarning nutqni zamonaviy va innovatsion metodik yondashuvlar asosida, xususan, ertaklar orqali shakllantirish, ularning lugʻat boyligini interfaol va ijodiy uslublar bilan kengaytirish muhim ahamiyat kasb etadi. Maktabgacha taʼlim davrida bolalarga sifatli taʼlim berish, ertaklar asosidagi turli metodikalardan foydalanib, ona tilidagi ogʻzaki nutqini rivojlantirish — natijada esa ular tengdoshlari va kattalar bilan erkin muloqot qila oladigan, mustaqil fikrlovchi va har tomonlama barkamol shaxs sifatida kamol topishini taʼminlash ustuvor maqsadlardandir**.**

Masalaning qoʻyilishi. Bola nutqini shakllantirish va rivojlantirish jarayonida ertaklarning tutgan oʻrni beqiyosdir. Ertaklar nafaqat bolaning soʻz boyligini oshiradi, balki ularni tinglash, tushunish, savol berish, javob qaytarish hamda fikr bildirish kabi asosiy kommunikativ koʻnikmalarni shakllantirishga xizmat qiladi. Ayniqsa ogʻzaki muloqot asosida qurilgan ertak mazmuni bola nutqini mustahkamlashda, muloqot madaniyatini oʻzlashtirishda va fikrni izchil hamda mantiqan ifoda etish koʻnikmasini rivojlantirishda muhim vosita boʻlib xizmat qiladi.

Ertaklar orqali bola nafaqat tilni oʻrganadi, balki psixologik va pedagogik jihatdan rivojlanadi, atrof-muhitdagi ijtimoiy munosabatlarni anglaydi va axloqiy qadriyatlarni egallaydi. Zamonaviy pedagogika va psixolingvistika yoʻnalishlarida olib borilayotgan tadqiqotlar ham shuni tasdiqlaydiki, bolalarning ertaklar orqali muloqotga faol jalb qilinishi ularning tafakkur va nutqiy faoliyatini sezilarli darajada rivojlantiradi. Shu bois, pedagog tomonidan toʻgʻri tanlangan ertaklar, rolli oʻyinlar, suhbatlar va interfaol mashgʻulotlar bola nutqini samarali rivojlantirish imkoniyatini kengaytiradi.

Til, nutq va nutqiy faoliyat bolaning ijtimoiy shakllanishida asosiy omillardan biri hisoblanadi. Til — insonlar oʻrtasida muloqotni taʼminlovchi ijtimoiy hodisa sifatida, bolada tafakkur va ongni shakllantirishda muhim rol oʻynaydi. Oʻzbekistonda yashayotgan turli millat vakillarining ona tili va milliy xususiyatlari ularning maʼnaviy madaniyatini ifoda etuvchi muhim omildir.

Til va tafakkur oʻrtasidagi uzviy bogʻliqlik ayniqsa ertaklar vositasida yaqqol namoyon boʻladi. Ertakdagi obrazlar, voqealar ketma-ketligi va mantiqiy tuzilma bolaning dunyoqarashi va xulq-atvoriga ijobiy taʼsir koʻrsatadi. Til tafakkurning ifoda vositasi sifatida bola fikrini shakllantirish, yetkazish va mustahkamlashda

asosiy vositaga aylanadi. Shu sababli, bola nutqini rivojlantirishda ertaklardan maqsadli foydalanish — ta'lim-tarbiyaning samaradorligini oshirishga xizmat qiluvchi muhim pedagogik vositadir. Bolaning nutqini rivojlantirishda monologik va dialogik nutq turlarini rivojlantirishga e'tibor qaratamiz.

"Diolog [yon. dialogos < di — ikki + logos — so'z; nutq; tushuncha] Ikki kishi o'rtasidagi og'zaki muloqot, suhbat. 2.Adabiy asarda ikki yoki bir necha personaj o'rtasidagi gaplashuv, suhbat. 3. Ikki yoki bir necha kishi o'rtasidagi uzluksiz suhbat, gaplashuv shaklida yozilgan adabiy asar" [1:605].

Nutqiy rivojlanish jarayonini A.N.Leontev quyidagicha tavsiflaydi: "Nutqni rivojlantirish jarayoni bola lug'atining va so'zlarning assotsiatsiya asosida boglanishining ortishida ifodalanadigan miqdoriy o'zgarishlar jarayoni emas, balki sifat jihatidan o'zgarish jarayonidir, zero, u fikrlash va ong rivojlanishi bilan ichki bog'langan holda so'zning barcha funksiyalari, tomonlari va aloqalarini qamrab oladigan haqiqiy rivojlanish jarayonidir"-degan edi [2;95].

Bolaning nutqiy rivoji va muloqotga kirishish salohiyati, asosan, mazmunan boy va ifodali og'zaki nutq orqali namoyon bo'ladi. Bunday ravon nutq o'zining mantiqlilik, izchillik va mazmunlilik xususiyatlari bilan ajralib turadi. Bu ko'nikmalarning shakllanishi, avvalo, bolaning o'zlashtirgan so'z boyligi va lug'aviy zahirasiga, shuningdek, uning intellektual, estetik va emotsional rivojlanish darajasiga bog'liqdir.

Bola nutqini mazmunan boyitish, uni aniq va ifodali qilishda ertaklarning o'rni alohida ahamiyat kasb etadi. Chunki ertaklar bolada so'zlarga bo'lgan qiziqishni oshiradi, yangi so'z va iboralarni kontekst asosida o'zlashtirishga yordam beradi, hamda obrazli fikrlashni rivojlantiradi. Ayniqsa, maktabgacha yoshdagi bolalar bilan olib boriladigan mashg'ulotlarda ertaklar asosida tashkil etilgan faoliyatlar orqali ularning nutqiy qobiliyatlarini rivojlantirishga erishiladi.

Bu jarayonda ertaklar yordamida bolada nafaqat tilni egallash, balki grammatik jihatdan to'g'ri so'zlash, voqealarni izchil tarzda bayon qilish va nutqning mantiqiy tuzilishini anglash ko'nikmalari shakllanadi. Shu bois, ertaklar asosida olib boriladigan mashg'ulotlar orqali bola nutqining rivoji uchun qulay va tabiiy muhit yaratiladi. Bu esa uning mustaqil fikrlashi, ijodiy yondashuvi va muloqotda faol ishtirok etishiga keng yo'l ochadi.

Yechish usuli. Bolaning og'zaki nutqi va muloqotga kirishish salohiyati ko'pincha u eshitgan va qayta hikoya qilgan ertaklar orqali shakllanadi. Ertaklarda uchraydigan voqealar, obrazlar va dialoglar bolaga so'z boyligini oshirish, fikr bildirish, savol berish va javob qaytarish kabi asosiy kommunikativ ko'nikmalarni rivojlantirish imkonini beradi. Shu sababli, ertaklar asosida olib boriladigan mashg'ulotlar bola nutqini mustahkamlashda muhim o'rin egallaydi.

Tarbiyachi bolalarning nutqini faollashtirish maqsadida ularni ertak qahramonlari aks etgan rasmlar, bolalar kitoblari va illyustratsiyalar bilan tanishtirib, ular asosida birgalikda kuzatish, ertakni muhokama qilish, hikoya tuzish kabi mashg'ulotlar tashkil etadi. Masalan, "Bo'ri va echki bolalari", "Zumrad va Qimmat" kabi ertaklardan parcha o'qib, "Bu voqeani o'zing boshdan kechirganmisan?", "Senga qaysi qahramon yoqdi va nima uchun?" kabi savollar

berish bolalarda voqelikni tushunish, fikrlash va ifoda etish ko‘nikmalarini shakllantiradi.

Shuningdek, bolalarni turli guruhlarda birgalikda ertak asosidagi rolli suhbatlarga jalb qilish samarali metodlardan biridir. Katta guruh bolalari kichik guruh bolalari bilan “Erkatoy quyoncha” yoki “Oltin kalitcha” kabi ertaklardan sahna ko‘rinishlarini o‘ynab, ularning nutqini jonlantirish va muloqotga kirishishiga yordam beradi. Bunday faoliyat davomida bola o‘z fikrini to‘g‘ri va izchil bayon qilish, ijtimoiy vaziyatga mos so‘z tanlashni o‘rganadi.

Ertaklar asosida tashkil etilgan syujetli-rolli o‘yinlar ayniqsa o‘rta guruh bolalari uchun muloqotga kirishish, rollarga kirish va nutqiy harakatni faol qo‘llashda muhim o‘rin tutadi. Bu orqali bola ertakdagi vaziyatni jonlantirib, unda qatnashuvchi qahramonlar tilida gapirishga intiladi.

Ertak motivlari bilan bog‘liq mehnat faoliyati ham bolaning nutqini rivojlantirishda samarali bo‘lishi mumkin. Masalan, “Ekin ekip yurgan dehqon” haqidagi ertak asosida pomidor ko‘chatlarini yerga o‘tkazish jarayoni tashkil etilib, har bir bolaga “dehqon” rolini berish orqali ular faol muloqotga kirishadi va o‘z faoliyatini og‘zaki izohlashga harakat qilishadi.

Tarbiyachining ertaklarni tanlashi va ular asosida metodik yondashuvlarni to‘g‘ri qo‘llashi bolaning grammatik bilimlarini ham rivojlantiradi. Yetti yoshga kirgan bola, odatda, ertaklardagi turlanish va tuslanishlarga boy gap tuzilmalarini eslab qoladi va o‘z nutqida qo‘llay boshlaydi. Masalan: tez yugurdi, sekin aytdi, chapga burildi kabi ifodalar ertak matnlarida ko‘p uchraydi va bolalar ularni kundalik nutqiga osonlik bilan qo‘shadi.

Shuningdek, ertak matnlarida uchraydigan ko‘makchilar va murakkab gap tuzilmalari bola nutqining sintaktik jihatdan rivojlanishiga xizmat qiladi. Dastlab, fazoviy ma’noda qo‘llanadigan “uydan chiqdi”, “devorga chiqdi” kabi iboralar, vaqt o‘tishi bilan sababiy va egalik ma’nolarini bildiruvchi shakllarga aylanadi, masalan: qo‘rqqanidan qichqirdi, onamning kitobi.

Yetti yoshga yaqin bolalar ertaklar asosida tuzilgan gaplarda bog‘lovchilar va ergash gaplardan foydalana oladi. Misollar:

Qo‘shimcha gap: Tulki nima bo‘lganini aytdi.

Maqsadli gap: Qahramon xazina topish uchun yo‘lga chiqdi.

Shartli gap: Agar yo‘ldan adashmasa, u manziliga yetadi.

Shunday qilib, ertaklar bola nutqining mazmuniy, grammatik va mantiqiy rivojlanishida keng ko‘lamli imkoniyat yaratadi. Ertak nafaqat o‘yin yoki hikoya, balki bola uchun tilni, fikrlashni va muloqotni o‘rgatadigan kuchli tarbiyaviy vositadir.

R. I. Lalaeva va N. V. Serebryakova ta’kidlaydilar: “Maktabgacha yosh davrida bolaning nutq shaklini badiiy asarlar bilan rivojlantirish muhimdir. Butun maktabgacha davr davomida bolalarda dialog tuzish (javob berish, savol berish, e’tiroz bildirish, tushuntirish, javob qaytarish) ko‘nikmalarini rivojlantirish zarur. Buning uchun bolalar bilan bolalar bog‘chasidagi hayoti, oilasi, kattalar va do‘stlari bilan munosabatlari, taassurotlari va qiziqishlariga oid turli mavzularda suhbatlar o‘tkazish muhim ahamiyatga ega”[3;167].

Mualliflar bola nutqining shakllanish davrlarini turlicha ko‘rsatadilar, ularni har-xil nomlaydilar va har birining yosh chegaralarini turlicha ifodalaydilar.

G. L. Rozengrad-Pupko bolada nutq rivojlanishni 2 davrga ajratadi:

1. Tayyorlov davri. (2 yoshgacha bo‘lgan davr)
2. Nutqning mustaqil shakllanish davri. A.N. Leontev bola nutqining shakllanishini 4 davrga bo‘lib ko‘rsatadi:

Tayyorgarlik davri- 1 yoshgacha.

Bog‘chagacha bo‘lgan davr- 3yoshgacha.

Maktabgacha bo‘lgan davr- 7 yoshgacha.

Maktab davri.

Maktabgacha yoshdagi bolalarga ta’lim berishda kompetensiyaviy yondashuv, ularning bilishga oid ehtiyojlari, muammolari va imkoniyatlariga samarali javob qaytara olish qobiliyatini rivojlantirishni, axloqiy me’yorlar va qadriyatlarni shakllantirishni, boshqalar bilan muloqot qilishni hamda shaxsiy “Men” konsepsiyasini barpo etishni o‘z ichiga oladi.

Maktabgacha yoshdagi (6-7yosh) bolaning tayanch kompetensiyalari:

- Kommunikativ
- Ijtimoiy
- Shaxsiy ("Men" konsepsiyasini qurish)
- Bilish [4;15].

Kommunikativ kompetensiya – “atrofdagi odamlar bilan o‘zaro munosabatlarning konstruktiv usullari va vositalariga ega bo‘lishni taqozo qiladi; muloqot qilish va yuzaga kelgan o‘yin, bilish, maishiy va ijodiy vazifalarni muvaffaqiyatli hal qilish qobiliyati” [4;16]. Bolalarda bu kompetensiyani shakllantirishda og‘zaki nutq, ayniqsa dialogik nutqning rivojlanishi muhim ahamiyatga ega. Ertaklar bolada muloqotga kirishish, savol-javob qilish, fikr almashish va o‘z fikrini izchil ifodalash kabi ko‘nikmalarni shakllantirish uchun tabiiy va qiziqarli vosita bo‘lib xizmat qiladi. Dialogik nutqning asoslarini o‘rgatishda ertaklardagi personajlar o‘rtasidagi suhbatlar, ularning o‘zaro munosabatlari va voqealar rivoji bolaga real hayotdagi muloqotga o‘xshash modelni taklif etadi.

Mazmunli va rag‘batlantiruvchi ertak muhiti — ya’ni ertakni tinglash, uni tahlil qilish, rollarga kirish va voqealarni qayta hikoya qilish jarayonlari — bolalarda og‘zaki nutqni rivojlantiradi, muloqotga bo‘lgan qiziqishni oshiradi va ularni faol suhbatdoshga aylantiradi. Shunday sharoitda bolalar o‘zlariga bo‘lgan ishonchni mustahkamlashadi, do‘stlari bilan erkin muloqot qilishni o‘rganadilar, atrof-muhit haqidagi tasavvurlarini boyitadilar va ertak asosida tashkil etilgan guruh mashg‘ulotlarida faol ishtirok etadilar. Bu esa ularning kognitiv va ijtimoiy rivojlanishiga bevosita ta’sir ko‘rsatadi.

Ertaklar asosida bola nutqini rivojlantirish usullari: Bola nutqini rivojlantirishda ertaklar asosida tashkil etilgan metodlar yuqori samaradorlikka ega. Ushbu metodlar bolaning yoshi, individual xususiyatlari va qiziqishlariga mos tanlanadi. Quyidagi usullar ayniqsa samarali hisoblanadi:

Suhbat – ertak qahramonlari va voqealar asosida savol-javob qilish, fikr bildirish orqali bolalarda og‘zaki muloqot va mulohaza yuritish ko‘nikmalari shakllanadi. Masalan: "Zumrad nega mukofot oldi?" kabi savollar bilan suhbat tashkil etiladi.

Rolli o‘yinlar – bolalar ertak qahramonlarining rolini bajarib, vaziyatga mos gapirishni o‘rganadilar. Bu ularning so‘z boyligi va muloqotga kirishish malakasini rivojlantiradi. Masalan, "Dev va bola" ertagiga asoslangan sahnalashtirish.

Ko‘rgazmali usullar – ertakka oid rasm, surat yoki videolavha asosida suhbat quriladi. Bu bolalarning tasviriy fikrlashini va og‘zaki izohlash qobiliyatini kuchaytiradi.

Nutqiy topshiriqlar – ertak voqeasini qayta hikoya qilish, qahramonni tavsiflash yoki davomini to‘qib aytish orqali bola mustaqil fikrlashni mashq qiladi.

Erkin suhbat – bola ertak asosida o‘z fikri, his-tuyg‘usi yoki voqeaga munosabatini erkin ifodalaydi.

Savol-javob va tahliliy suhbatlar – ertak mazmuni asosida tahliliy savollar berish orqali bolada voqealarni anglash, baholash va fikrini asoslash ko‘nikmasi shakllanadi.

Ushbu usullar orqali ertaklar bolalarning nutqiy, mantiqiy va ijtimoiy rivojlanishiga kuchli turtki beradi.

Natijalar va namunalar: Maktabgacha katta yoshdagi bolalarning nutqini rivojlantirish maqsadida ertaklar asosida mashg‘ulotlar frontal, kichik guruhli va individual shakllarda tashkil etildi. Kichik guruh mashg‘ulotlarida bolalar ertak syujetlariga asoslangan rolli o‘yinlar, juftlikdagi suhbatlar va munozaralarda ishtirok etdilar.

Tajriba davomida quyidagi metodik vositalar qo‘llanildi:

✓ ertak mazmuniga mos rasmlar, kartochkalar;

✓ dialog shaklida tuzilgan didaktik o‘yinlar;

✓ savol-javoblar, hikoya tuzish, ertakdagi qahramonlar haqida fikr bildirish topshiriqlari.

Bolaning muloqotga kirishish, suhbatni davom ettirish va grammatik jihatdan to‘g‘ri fikr bildirish ko‘nikmalarini baholash uchun maxsus mezonlar ishlab chiqildi. “Fikr bildir” metodikasi orqali bolalar ertakdagi voqealarga nisbatan o‘z munosabatini ifoda etdi.

Mashg‘ulotlar davomida bolalarning og‘zaki nutqdagi faolligi, savollarga javob berishga intilishi va emotsional ifodasi kuchaydi. Ayniqsa, dramatizatsiyalashgan ertak topshiriqlari orqali bola nutqining ifodaviyligi va izchilligi aniq namoyon bo‘ldi.

Jadvallar: Tajriba guruhiga 30 ta tarbiyalanuvchi jalb etildi va natijalari statistik jihatdan ham tahlil qilindi. Ushbu tahlil asosida tajriba guruhidagi bolalarning nutq rivojlanish darajasi nazorat guruhiga nisbatan 12 % ga oshganligi aniqlandi. Bu esa tadqiqot davomida qo‘llanilgan metodik yondashuvlarning samaradorligini isbotlaydi va ularni maktabgacha ta’lim tizimida keng joriy etish imkoniyatini ko‘rsatadi. Buni quyidagi jadval orqali keltirishimiz mumkin.

1-jadval.

Tajriba boshi va oxiridagi xulosalar

Ko‘rsatkichlar	Nazorat guruhi (%)	Tajriba guruhi (%)	Farq (%)
Muloqotga kirisha olish	22	34	+12
Suhbatni davom ettirish	23	35	+12
Savol-javob faoliyatida ishtirok	22	34	+12
Fikrni izchil va grammatik to‘g‘ri ifodalash	24	36	+12
Ertak asosida mustaqil hikoya tuzish	23	35	+12
Qahramonlar roliga kirish va dramatizatsiya	25	37	+12

Xulosa. O‘tkazilgan tajriba-sinov ishlari shuni ko‘rsatdiki, ertaklar asosida tashkil etilgan metodik, emotsional va interfaol faoliyat shakllari maktabgacha yoshdagi bolalarda muloqotga bo‘lgan ichki ehtiyojni kuchaytiradi, ularning suhbatdosh sifatida faolligini oshiradi hamda nutqiy va ijtimoiy kompetensiyalarini rivojlantirishga xizmat qiladi.

Ertak syujetlari asosida olib borilgan mashg‘ulotlar bolalarning erkin fikr bildirish, o‘z qarashini ifoda etish, suhbatni davom ettirish hamda og‘zaki nutq orqali o‘zini ifodalash qobiliyatini takomillashtirib, ularning shaxsiy nutqiy faoliyatiga ijobiy ta’sir ko‘rsatdi.

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PERSONAL AND COMMUNITY HYGIENE IN PHYSICAL EDUCATION AND SPORTS

Annotation. *Hygiene is a science about health, about the means and methods of preserving, strengthening it, and eliminating the harmful effects of environmental factors on it. The article discusses personal and collective hygiene in physical education and sports.*

Keywords*: sports medicine, nutritionist, healthy lifestyle, physical education, sports doctor, trainer.*

All conditions have been created and are being created to preserve and strengthen the health of the people of the Republic of Uzbekistan, prolong human life and prevent diseases. From time immemorial, physical education and sports have been considered an integral part of social life, and their development has been inextricably linked with the specific characteristics of each era.

Great attention is paid to the development of the sports sector in our country. A number of decisions and decrees on the subject have been adopted and are being implemented. This is of great importance in the achievements of our athletes in the international arena.

It is known that physical education and sports lead to the comprehensive physical development and strengthening of the human body, improvement of physiological functions and health.

Physical education hygiene is one of the sections of hygiene science. The content of physical education hygiene is the scientifically based standardization of the means, methods and conditions of physical education and sports activities in order to more effectively use them in order to preserve and strengthen the health of a person and his health. In order to justify more effective methods and the most favorable conditions of physical education, physical education hygiene studies how physical exercises affect human health and to what extent they serve to strengthen health.

Physical education and sports hygiene is the science of the influence of various factors related to physical education and sports on the health of participants. The main factors affecting the body of participants are:

- - environmental factors
- - conditions in which physical education classes, recreational physical education classes, training and competitions are held;
- - organization and content of physical exercises in physical education classes, health-improving physical education classes and competitions;

- - volume, duration and intensity of physical exercises during physical education classes, recreational physical education classes, training and competitions;

- - nature of nutrition during physical education, training and competitions;

- - technical equipment and condition of sports facilities;

- - equipment for athletes.o

In recent years, valuable scientific data have been obtained that allow hygienic provision of physical education and sports, taking into account age, gender and professional functional capabilities and individual characteristics of participants, climate and other external factors.

Physical exercises, regardless of their form and content, must strengthen the health of those involved, which is fully consistent with the health-improving nature of the entire physical education system.

The implementation of the health-improving principle of physical education is possible only if the physical education teacher, sports coach is familiar with the basic rules of hygiene and, in the words of F.F. Erisman, learns the “hygienic way of thinking”[6, 6].

The goal of hygiene is human health. However, there is still no clear definition of health. Most experts agree with the definition of health given by the specialists of the World Health Organization: "Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity."

If we talk about the reforms of physical education and sports education in general, first of all, a transition was made to a system of promoting a healthy lifestyle from kindergarten age. Starting from the promotion of healthy eating and a healthy lifestyle from childhood, all the necessary conditions were created for our boys and girls to engage in sports during their school years. New gyms were built in schools, existing ones were radically renovated, and the material and technical base was strengthened.

The higher education system was also reformed, and international standards were introduced for the training of athletes specializing in national and Olympic sports. The main emphasis was on effectiveness, and a system of encouraging athletes and their coaches who achieved high results at the republican and international levels was established.

Such changes can be talked about for a long time. The President's resolution of July 28, 2023 "On measures to further improve the system of training medical personnel for the field of physical education and sports and the provision of medical services to athletes" is significant in that it serves to further improve the provision of high-quality medical services to athletes by purposefully continuing systemic reforms in this area and implementing modern methods of training personnel in the field of sports medicine.

Today, as professors and teachers involved in the field and interested in the implementation of this resolution, we would like to dwell on the most important aspects of this resolution.

Physical education is a pedagogical process organized for the implementation of physical movements by people. Physical education work in an educational institution differs in a wide variety of forms that require enthusiasm, initiative, and organization from pupils and students. They help to cultivate such qualities as organizational skills, activity, and resourcefulness in students.

Protecting one's own health is the direct responsibility of every person and does not have the right to delegate it to others. A person aged 20-30 falls into a fatal state due to an unhealthy lifestyle, bad habits, hypodynamia, and overeating, and only then remembers medicine. Health is the first and most important need of a person, which determines his working capacity and ensures the harmonious development of the personality. This is the most important condition for understanding the world around us, self-affirmation, and human happiness. Active longevity is an important part of the human factor.

The main tasks of physical education and sports hygiene are clearly defined on the basis of solutions based on many years of experience in the field of sports medicine. The goal is to study and improve the conditions for engaging in physical education and sports, as well as to develop hygiene measures that strengthen health, working capacity, endurance and sports performance. As mentioned above, physical activity affects the whole organism, not individual organs or systems.

Sports medicine is a separate area of medicine, a scientific and practical field with its own goals, objectives, methods, theory and problems. In Uzbekistan, medical support for physical education and sports is carried out on a territorial basis through special medical and physical education services (offices, dispensaries) and treatment and prevention institutions of health care bodies. Sports medicine is not only the main part of the treatment and prevention service of the population, but also an integral part of the system of physical education of a person.

Without compliance with the relevant hygiene standards and requirements in the process of physical education and sports, it is impossible to ensure optimal conditions for normal physical development, preservation and strengthening of the health of those involved in physical education, and improvement of sports achievements.

The basis of medical examinations of those involved in physical education and sports is the determination and assessment of their level of physical development. In order to make an opinion about the proportionality of the physical development process, the results of the primary examination of the examinee are compared with his anamnesis. In repeated examinations, we get a clear idea of the effect of physical education on physical development, depending on the changes in anthropometric indicators.

The goal of sports medicine is to strengthen health, to provide all possible assistance to the development of physical culture and sports as tools that contribute to the harmonious development of health care. In short, the effective use of all the opportunities provided by our state in determining the long-term prospects for the development of sports and educational institutions, creating the necessary

conditions for training a reserve of athletes in Olympic and Paralympic sports, is one of the urgent tasks facing us today.

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DIGITAL STRATEGIC MARKETING METHODOLOGY «5S STRATEGY FRAMEWORK». RELEVANCE AND ADAPTABILITY IN THE DIGITAL ECONOMY

Abstract: *The article presents the development and application of the digital marketing methodology «5S Strategy Framework», tailored to the digital economy. Five core stages of the framework, their essence, and practical significance are described. The methodology has proven its effectiveness in international projects and educational programs.*

Keywords: *digital marketing, strategy, automation, scaling, segmentation, analytics.*

Field of application: Marketing, e-commerce, business consulting, product management, training and preparation of specialists in the digital field, and strategies for launching new products to the market.

Purpose of the development:
This methodology is intended for:
- systematizing the processes of strategic marketing planning;
- creating a digital promotion architecture;
- scaling marketing activities;
- integration of analytics, automation, and customer experience into a unified model.

Introduction:
Traditional marketing frameworks (e.g., 4P, STP, AIDA) do not involve active work with programmable, digital tools.
The drawback of existing research is the lack of a unified framework that combines segmentation, strategy, structure, system, and scaling with digital tools.
5S Strategy Framework combines strategic logic and digital implementation, making it applicable in the context of the digital economy.
It implies an inseparable connection between analytics, technology, and customer experience.
The methodology is developed with current requirements for adaptability and real-time automation in mind.
The article aims to demonstrate how the synthesis of IT skills and a marketing approach enhances the product launch strategy.

Brief description:
"5S Strategy Framework" is a universal five-step methodology for digital strategic marketing, based on the following logic:
Segmentation → Strategy → Structure → System → Scale.

The methodology combines elements:
- strategic management;
- digital marketing;
- automation of business processes;
- user behavior analytics.

Each stage (5S) includes practical tools, technical solutions, and digital approaches applicable in both B2B and B2C environments.

Detailed description:

1. Segmentation
Analysis and segmentation of the target audience based on digital, behavioral, demographic, and motivational characteristics using:
- CRM systems;
- scripts in Python / SQL for clustering;
- heatmaps of behavior;
- cohort analysis;
- Google Analytics 4 and other analytics systems.

2. Strategy
Development of an individual interaction strategy with segments, including:
- competitive analysis (SWOT, PEST);
- ROI modeling;
- selection of communication channels;
- A/B testing of hypotheses;
- creating a unique value proposition (UVP).

3. Structure
Formation of digital marketing architecture:
- creation of CJM (Customer Journey Map);
- setting up sales funnels;
- organization of content logic and touchpoint structure;
- visualization through Miro, Notion, Figma, etc.

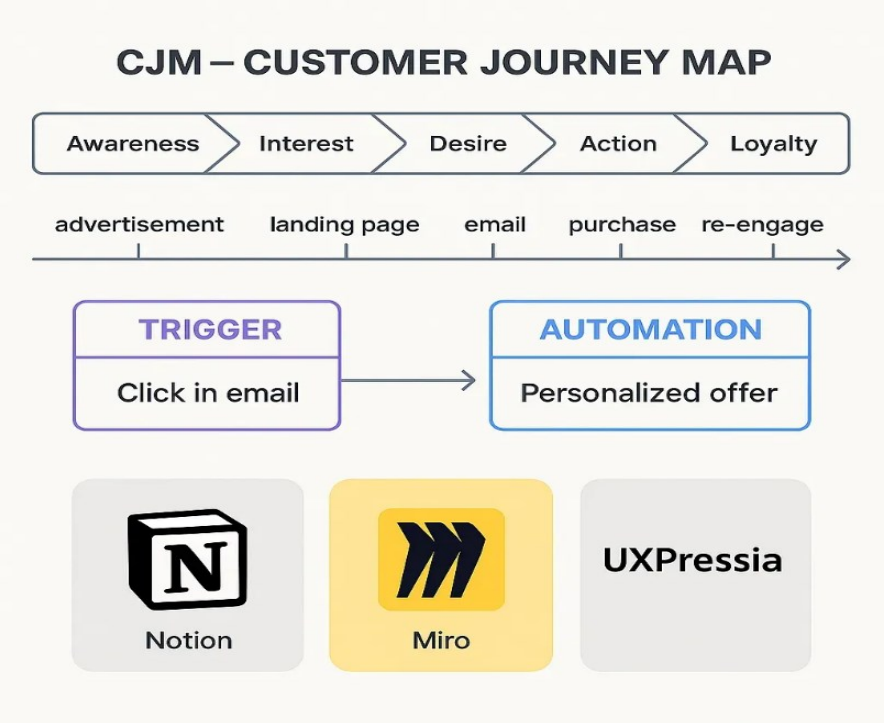

Fig. 1. Example of CJM — Customer Journey Map (Stage: Structure)

4. System

Digital implementation and process automation:
- implementation of end-to-end analytics (Roistat, Power BI, OWOX BI);
- integrations with advertising account APIs (Facebook Ads, Google Ads);
- automation through Zapier / Make / custom scripts;
- setting triggers for adaptive real-time strategy operation.

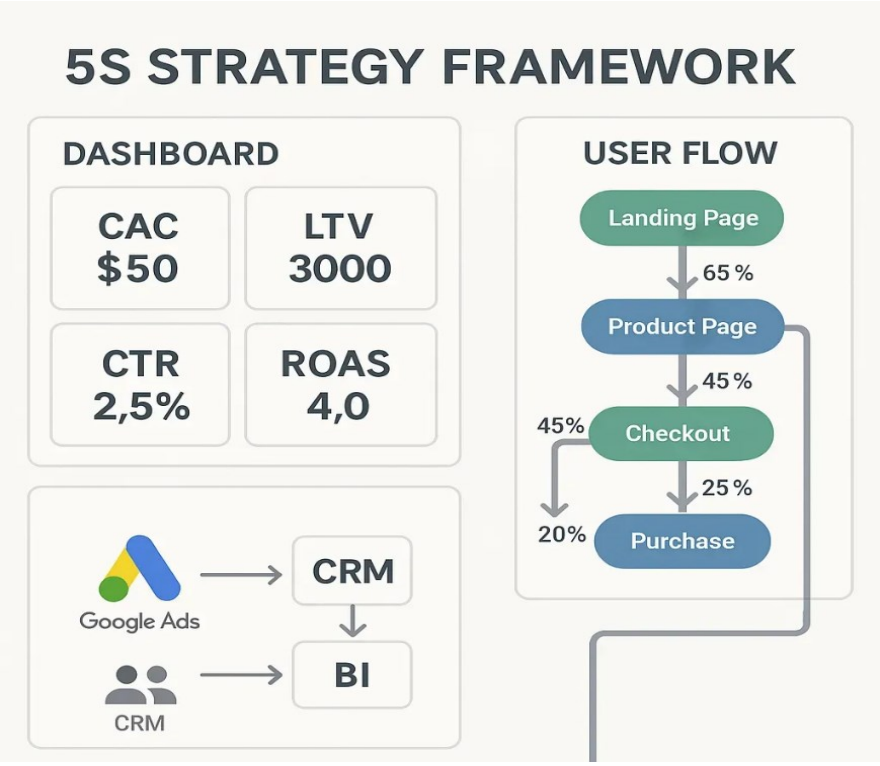

Fig. 2. Example of End-to-End Analytics (Stage: System)

5. Scale (Scaling)

Scaling the strategy to new regions, channels, and products:
- localization for regional markets (language, cultural codes);
- adaptation to marketplaces (Amazon, Ozon, Alibaba);
- multichannel campaigns (social networks, messengers, email, etc.);
- use of digital funnel templates and universal modules.

scss

User > Interface > Segmenter (ML) > Campaign Generator > BI module

Automatic logic circuit:

User action → trigger → automatic channel selection → campaign launch

Fig. 3. Example of an Architecture Framework

The fundamental difference from known solutions:

The 5S Strategy Framework differs from existing models (4P, STP, AIDA) in that:
- was initially developed as a digital-first system;
- includes automated digital tools at every stage;

- supposes dynamic adaptation of the strategy based on real-time user data;
- intended for both operational use and mass production.

Methods of evaluating effectiveness:

For an objective assessment of the results of implementing the 5S Strategy Framework, key performance indicators (KPIs) are used, including:

LTV (Lifetime Value) — calculated using the formula:

LTV = (ARPU × average customer retention duration) − CPA, where ARPU is the average revenue per user, and CPA is the customer acquisition cost.

The methodology allows tracking changes in LTV in real-time through end-to-end analytics, enabling the assessment of the contribution of individual stages of the strategy to customer retention and profitability.

CAC (Customer Acquisition Cost) — calculated as:

CAC = Total marketing and sales expenses / Number of new customers over the period.

The framework provides for regular analysis of CAC by channels and segments, as well as dynamic cost optimization through funnel automation and hypothesis testing.

ROMI (Return on Marketing Investment):
ROMI = (Additional Profit − Marketing Expenses) / Marketing Expenses × 100%
Used within the strategic phase (Strategy) for A/B testing, channel selection, and scenario modeling.

CRR (Customer Retention Rate) and NPS (Net Promoter Score) are integrated into the feedback system and allow for monitoring the effectiveness of structural and service solutions implemented at the Structure and System stages.
Statistical validation of segmentation and forecasting models
To confirm the validity of clustering and forecasting models within the Segmentation and Strategy stages, the following methods are applied: Silhouette Score and Elbow Method for optimizing the number of clusters; Intra-cluster variance and inter-cluster distance metrics as tools for evaluating segmentation quality;

Methods of cross-validation (k-fold cross-validation) and splitting into training and test sets for validating predictive models;

ROC curve, AUC, Precision / Recall / F1-score — when building response models to marketing impacts, including predictive retargeting scenarios; Using ML libraries (scikit-learn, XGBoost, LightGBM) to automate the process of building and evaluating models, with output of interpretable metrics and the ability to tune hyperparameters.

Such systematic analytics allow for justifying the effectiveness of marketing decisions not only in practice but also in terms of the formal validity of the models, which enhances the scientific and practical value of the methodology.

Practical application:

The 5S Strategy Framework methodology has been tested and implemented in international projects involving major companies:

- Henkel: a 25% increase in LTV through dynamic automation of segmentation and retargeting.
- TDK Corporation: 18% reduction in CAC through optimization of CJM and lead generation scripts.
- Autocom Japan: successful launch in 3 countries with a single scalable strategy template.

as well as in educational programs for specialists in strategic and digital marketing, in individual consulting for small and medium-sized businesses.

Contribution to industry development:

Tatsiana Slaunova contribution to modern marketing encompasses strategic, educational, and applied levels, with an emphasis on the interconnection of digital tools and global adaptation (Internet marketing). The relevance of using digital tools for product promotion in the modern market has been proven. The 5S Strategy Framework is a unique framework that includes digital channels and automated tools for launching products in new markets, formed as a result of the synthesis of IT and marketing. Innovations:

- Use of software and technical skills to create end-to-end analytics systems.
- Development of custom dashboards for tracking the effectiveness of digital campaigns.
- Development of scripts for parsing the semantic core and automatic generation of meta-tags, which reduces the time spent on content preparation and increases its relevance.
- Implementation of machine learning models for consumer clustering and response prediction within SMM and PPC campaigns.

The 5S Strategy Framework methodology involves not just a step-by-step transformation plan but also a way of shaping a mindset that enables managers and employees to build innovative processes adapted to global standards in a rapidly changing market.

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THE ROLE OF ETHNIC CULTURE IN EDUCATING THE YOUTH OF THE NEW UZBEKISTAN IN THE SPIRIT OF THE NATIONAL IDEA

Annotation: *The article is dedicated to the development of young people, their understanding of national ideology and ethnocultural values. Describes the processes of a healthy lifestyle and the formation of a sense of respect for national and national values in order to avoid the emptiness of young people in the spiritual world. It also describes the state of youth policy and the problems of universal volues.*

Key words: *national magination, traditions, ceremonies, perfect man, national pride, national pride, spirituality, national values, universal values, democracy, civil society.*

The national idea, based on the centuries-old traditions, customs, language, religion and psyche of our people, serves to instill in our minds a sense of confidence in the future, kindness, honesty, patience, justice and enlightenment. With a deeper study of the national idea, in understanding its roots, values are to one degree or another important in the life of every citizen. Independence made it possible to restore the traditional values of the Uzbek ethnic culture, their effective use, direct and complete familiarization with the world culture and civilization of our people, the achievements of advanced countries, and universal values.

Ethnoculture is not an absolutely formed, unchanging reality, it is transformed under the influence of social processes in society, under the influence of spiritual, cultural, spiritual needs, interests and demands of people, adopts innovations in accordance with their interests. In Uzbek ethnoculture, this is reflected in modern art forms - variety art, fine art, choral art, technical creativity, tourism, physical culture and sports, archery, circus art. These innovations enrich the Uzbek ethnic culture with new, non-traditional forms of creativity aimed at recreating and developing creative and cultural abilities.

It is important to study the traditional folk culture of ethnic culture as a whole and a multifaceted phenomenon, to determine its structure, main types, forms. Therefore, based on the evolution of ethnic culture and the generally accepted classification of "culture", it is advisable to single out the main directions of folk culture. Along with the identification of the main manifestations and trends of folk culture, the identification of its specific features and descriptive features is also of great scientific importance.

Culture (folk culture) is a complex, multifaceted, sociodynamic phenomenon with its own internal structure and characteristics, its manifestation and organization in social life, its place in spiritual and educational life. Ethnoculture is the core of

this phenomenon, which has become the historical and cultural paradigm of an ethnos associated with the socio-historical, spiritual life, lifestyle of a particular people, nation.

Ethnoculture is a social reality that reflects the material and spiritual wealth of the people, nation, way of life, language, customs, assimilation and change of the surrounding world, ways of self-realization, understanding, in a word, the existence of an ethnic group, a nation ... Universality and nationality in the ethnic culture of the Uzbek people are dialectically are interconnected and are manifested in the relationships and functional features of the subject-ethno-superethnosystems that have been formed in the process of long-term socio-historical development.

Subcultures include the values, customs, material and spiritual wealth of communities within society, territorial national groups and associations formed to meet their national and cultural needs. Since the subculture has always represented the material and spiritual needs of a limited number of ethnic associations, they diversify the ethnic culture and adapt it to the requirements of the time in accordance with certain internal laws.

Ethnoculture and traditional folk culture, which is its integral part, can be divided into many areas: folk wisdom, folk philosophy, folk customs, folk art, folk games, folk cooking, folk arts and crafts, folk medicine, folk culture of everyday life.

Particular attention should be paid to the wisdom of the people as part of ethnic culture, since the worldview and philosophical concepts of generations are reflected in all areas of traditional folk culture. This is due to the fact that the emergence of an ethnic culture that expresses the ideas, thoughts, knowledge, worldview of the people is unthinkable without the philosophical wisdom of the people. The analysis shows that the deeper the philosophical and ideological content of folk culture, the stronger its form and the more eternal its social significance.

In the historical process, in which the state pays special attention to our national values and spiritual heritage, scientists not only give written descriptions of our traditional rites when studying traditional rites, but also the role of ancient national rites in folk life and traditional cultures, their genesis and features Research factors conservation are of great scientific and practical importance.

However, unfortunately, in the field of ethnology, cultural studies, folklore and folklore, there are still no perfect theoretical and methodological views on the definition and description of the above terms and their distinguishing features. Therefore, in some cases, some researchers use synonyms for a number of terms, such as "ceremony" and "tradition", "tradition" and "holiday", or use them without a consistent distinction.

Tradition is a cultural phenomenon that arises in the process of historical development on the basis of natural and social needs inherited from ancestors and influences the cultural life of people. Tradition is a set of rules and regulations that are violated (as a whole or by a certain group) in the minds of people as a certain social rule.

The concept of tradition is very broad, it covers all aspects of people's lives - simple everyday customs, rituals, rituals, interactions and all rituals. The concept of ceremony is a relatively narrow concept, consisting of demonstrations accepted by the public in certain areas of the life of the people, often of a symbolic nature and specially organized by a set of specific individuals.

The ritual is also an event that takes place and will take place with the demands and needs of the material and spiritual life of a person. Any ritual is created and lives in such a way that it combines the main features that testify to the level of socio-economic, political and cultural development of one or another stage of the historical development of the nation. In other words, the ceremony is a vital event with generally accepted symbolic actions.

A custom is a habitual behavior that is ingrained in people's lives and repeated over a period of time. So, from brief notes about this rite and tradition, it is clear that if the concept of tradition covers all spheres of people's lives, then the concept of rite applies only to certain areas of life. If custom is a rule that must be performed by one person or by a majority at the same time, then ceremony is an action that must be performed by appointed persons. In particular, the Uzbeks have a tradition to greet the elders first or greet the poor, or show special respect for guests visiting relatives, old people and neighbors on the eve of the holiday.

In short, the difference between rituals and ceremonies can also be understood by the degree to which symbolic actions are used in them. In particular, while ritual fully encompasses both symbolic and non-symbolic actions, ceremony only covers actions of a symbolic nature. Moreover, if the tradition is basically the same for a particular people - an invariable rule, norm, then the rite will also have sharp local differences within the same people. Also, any rite is one of the components of the folk customs to which it refers. So one can look for elements of tradition in ritual, but one cannot look for ritual in ritual. In a slightly different way, in the words of the folklorist B. Sarimsakov, any rite is a rite, but any rite cannot be a rite.

Uzbek values are at the heart of folk culture. The great educational value of Uzbek values in the upbringing of the younger generation, including student youth, in terms of socio-political, spiritual, ideological, cultural, educational and moral, moral, spiritual and physical maturity lies in their socio-pedagogical, social life, great hopes closely related to ideals.

Acting President of the Republic of Uzbekistan Shavkat Mirziyoyev, in his speech at the opening ceremony of the 43rd session of the Council of Ministers of Foreign Affairs of the Organization of Islamic Cooperation on October 18, 2016 in Tashkent, said: “In a great history, nothing goes unnoticed. It is preserved in the blood of peoples, in their historical memory, manifested in their practical activities. That is why he is powerful. Preservation, study and transmission of historical heritage from generation to generation is one of the most important priorities of our state policy. The honorable duty of each of us is to preserve and cherish our sacred religion, which embodies our ancient values and moral qualities”, he said.

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HUMAN BEING AS THE MAIN FACTOR IN THE FORMATION OF ETHICS

Abstract: *This article explores the role of the human being as the central factor in the formation and development of ethical norms. Ethical values are not innate but develop in the social, cultural, and individual spheres of human life. The study emphasizes the interaction between personal behavior, moral consciousness, and social influence in shaping ethical standards. The paper also highlights the importance of education, family, and environment in nurturing moral qualities and fostering a responsible individual in society.*

Keywords: *Human, ethics, morality, value system, upbringing, social environment, personality development.*

Introduction

The concept of ethics has always played a fundamental role in human civilization. From ancient times to the modern day, questions of right and wrong, virtue and vice, justice and responsibility have guided human thought and social organization. While many philosophical schools have tried to define the origins of ethics—whether divine, natural, or rational—what remains consistent is the **central role of the human being** in developing, internalizing, and applying moral principles.

Ethics is not just a theoretical system of values; it is a lived practice that reflects a person's choices, actions, and relationships with others. In this context, the human being is not merely a passive recipient of moral norms, but an **active agent** in creating, transforming, and upholding ethical standards. Thus, the development of ethical consciousness is inseparable from the development of the individual within society.

Theoretical Foundations of Ethics and Human Role

Ethics, derived from the Greek word *ethos* meaning character or custom, refers to the philosophical study of morality. It deals with questions such as: What is good? What is the right way to act? What obligations do we have toward others?

While ethical theories vary—from deontological and utilitarian to virtue-based approaches—they all converge on the **human subject** as the point of application. A law may define what is legal, but **ethics defines what is right**, and it is the human conscience that interprets and enacts this standard in daily life.

Theories by Aristotle, Kant, Confucius, and Eastern philosophers place the **individual's moral development** at the center of a harmonious society. Without ethical humans, the highest laws or systems fail to achieve justice or cohesion.

Ethics as a Social and Cultural Product

Ethical values are **not biologically inherited**, but rather cultivated through culture, traditions, education, and interpersonal communication. A child is not born with a sense of duty, honesty, or compassion—it is **through interaction with parents, educators, and society** that these values are introduced and internalized.

Human beings, therefore, are **simultaneously the carriers and creators** of ethical systems. In each era, ethical norms evolve depending on historical, cultural, and technological changes, but always require human agency to be interpreted, applied, and passed on.

For example:

- In traditional societies, values such as respect for elders and communal loyalty were dominant.
- In modern societies, principles like human rights, environmental responsibility, and individual autonomy have become central.

Human Factors in the Formation of Moral Character

The process of forming ethical behavior includes several **key stages and influences**:

1. **Family** – The first and most influential environment for ethical education. Parental guidance, emotional care, and role modeling deeply affect a child's moral development.
2. **Education** – Schools provide formal instruction on ethics, civics, and social responsibility. Ethical dilemmas discussed in the classroom help develop critical moral reasoning.
3. **Society and Media** – Social norms, laws, traditions, and mass communication either reinforce or erode ethical behavior. Humans reflect what they consume and engage with daily.
4. **Self-awareness and Reflection** – Ultimately, the human capacity for self-reflection, empathy, and critical thinking plays the defining role in ethical decision-making.

Each human being goes through a **moral evolution** influenced by their personality traits, upbringing, cultural background, and life experiences. This moral identity becomes a cornerstone for active citizenship and peaceful coexistence.

Contemporary Challenges and the Role of Ethics

In the modern world, where globalization, digitalization, and cultural pluralism intersect, new ethical dilemmas arise: data privacy, environmental degradation, artificial intelligence, inequality, and more. Amid these challenges, the human being remains the **primary agent of moral responsibility**.

Societies must therefore focus on **ethical education**, not just as an academic subject, but as a holistic development of human values. This includes:

- Promoting empathy and solidarity,
- Encouraging critical thinking about social justice,
- Instilling a sense of responsibility to the planet and future generations.

Conclusion

The human being is the most essential factor in the formation and evolution of ethics. Without ethically conscious individuals, no society can achieve harmony, justice, or sustainability. As both a product and a producer of morality, each person holds the potential to influence ethical progress.

Educational institutions, families, communities, and governments must recognize the transformative power of moral education and invest in nurturing **ethically responsible, socially aware, and intellectually reflective individuals**. Only through such efforts can humanity confront the complex moral issues of the 21st century and build a more just and ethical world.

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ATOM ELEKTR STANSIYALARI VA UNLARING ISHLASH PRINSIPI

Annotatsiya: *Ushbu maqolada atom elektr stansiyalari va unlaring ishlash prinsipi va atom elektr stansiyasida kechadigan jarayonlar ko`rib chiqilgan va tahlil qilingan.*
Kalit so`zlar: *elektr stansiyasi, elektr energiyasi, reaksiya*

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NUCLEAR POWER PLANTS AND THEIR OPERATING PRINCIPLES

Abstract: *This article reviews and analyzes nuclear power plants, their operating principles, and the processes occurring in a nuclear power plant.*
Key words: *power plant, electric energy, reaction*

Zamonaviy atom elektr stansiyasi og'ir yadrolarning neytronli reaksiyalarining yadroviy reaksiyalariga asoslanadi. Organik yoqilg'ilarni yonishining kimyoviy reaksiyasidan farqli ravishda yadroviy reaksiyalarda reaksiyaning dastlabki va oxirgi mahsulotlari kislorod, havo yoki boshqa tashqi moddalar talab qilmaydi. Ajralib chiqqan yadroviy energiya parchalanish bo'laklari va neytronlari orasidagi kinetik energiyaga va nurlanish energiyasiga taqsimlanadi. Reaktorning aktiv zonasidagi moddada bo'laklar to'xtaydi, nurlanish yutiladi va uchuvchi neytronlarning energiyasidan tashqari barcha energiya issiqlikka aylanadi. Bunday boshqarilmaydigan zanjirli reaksiya juda tez sodir bo'ladi (atom bombasini portlashi), ushbu issiqlik portlash zonasida haroratni million gradusga ortib ketishiga olib keladi. Atom elektr stansiyalarining reaktorida reaksiya rostlanadi, yoqilg'ini yonishi sekinlashtiriladi, reaksiya zonasidagi issiqlik suyuq yoki gazsimon issiqlik tashuvchilar bilan sovitish hisobiga olib ketiladi.

Insonlar energiyaning saqlanish qonunini buzmasdan energetik qurilmalar yordamida tabiiy energetik manbalardan foydalanib kerakli energetik samarani olishi mumkin. Issiqlik elektr stansiyalarida bunday tabiiy manbalar sifatida organik yoqilg'ilardan foydalaniladi. Yoqilg'i yonganda kimyoviy energiya ajralib chiqadi va bu energiya yonish mahsulotlarining issiqlik energiyasiga aylanadi[6,7].

Atom elektr stansiyalarida tabiiy manbalar sifatida yadroviy yoki noorganik yoqilg'ilardan foydalaniladi. Og'ir yadrolarning yadroviy parchalanish

reaksiyalarida yoki yengil yadrolarning sintezi natijasida yadroviy energiya ajralib chiqadi.

Yadroviy reaksiyalarning sodir bo'lishida parchalanish haroratga bog'liq emas, bu nuqtai nazardan reaktorning aktiv zonasida har qanday harorat ta'minlanishi mumkin. Termodinamika nuqtai nazaridan qizdirgich yuqori haroratga ega bo'lishi kerak, ammo uning haroratini ortishi qurilmaning barcha konstruksion metariallarining issiqlik bardoshligi bilan chegaralanadi. Hozirgi vaqtda atom elektr stansiyalari yaratilgan va ishlab kelmoqda, ularda asosan og'ir elementlar yadrolarini parchalanishi natijasida ajraladigan energiyadan foydalaniladi, og'ir elementlarga asosan uran 235 va 238 ning izotop aralashmalarini va plutonni kiritish mumkin. Issiqlik tashuvchilar sifatida suv, gazlar (geliy, azot, karbonat angdrid gazi), suyuq metallar (kaliy va natriy), organik suyuqliklar (uglevodorodlar, difenil, difenil efir, trifenil, izopropil) dan foydalaniladi[6,7].

Birinchi AESning qurilishi. Sobiq Ittifoq olimlari o‘tgan asrning 40-yillarida ana shunday elektrostansiyalarning ishlash tamoyillari borasida izlanishlar olib borishni boshlashgan. 1948 yilda I. Kurchatov hukumatga atom energiyasini ajratib olish bo‘yicha ishlarni boshlashni taklif qiladi. 1950 yil mayda Kaluga oblastidagi Obninsk shahrida dunyodagi birinchi AES qurilishi boshlanadi. Quvvati 5 MIt bo‘lgan mazkur AES qurilishi 1954 yilda yakunlanadi va Obninsk AESi ishga tushadi.

Yadroviy reaktor yordamida elektr energiyasi esa ilk bor 1951 yilda AQShning Aydaho shtatida olinadi. U tajribaviy bo‘lib, atigi 800 Vt energiya ishlab chiqaradi. Uning ishlashini tekshirib ko‘rish uchun generatorga to‘rtta cho‘g‘lanma lampochka ulanadi va hech kim kutmagan holda bu lampochkalar yonadi.

AES yonilg‘isi qayta ishlash. Yadro reaktorida bir yil foydalanilganidan so‘ng uran almashtirilishi kerak bo‘ladi. Yonilg‘i unsurlari bir necha yil davomida sovutilib, maydalash va eritishga yuboriladi. Kimyoviy ekstraksiya natijasida uran va plutoniy ajralib chiqadi va ulardan yangi yadroviy yonilg‘i ishlab chiqariladi va qayta foydalaniladi.

Uran va plutoniy parchalanishidan olingan mahsulotlardan ionli nurlash manbalari tayyorlanadi, ulardan tibbiyot va sanoatda keng qo‘llaniladi.

Ushbu jarayonlardan so‘ng ajralgan chiqindi eritilib undan shisha tayyorlanadi, shishalar maxsus omborlarda saqlanadi. Ushbu shishalardan radioaktiv moddalarni saqlashda foydalaniladi. Shishadan atrof-muhitga zarar yetkazadigan radioaktiv unsurlarni ajratib olishning deyarli imkoni yo‘q.

AESning afzalliklari. Yadroviy energetikani rivojlantirish tarafdorlari atom elektr stansiyalarining ustun jihatlariga e'tibor qaratishadi. Xususan, Jahon yadro assotsiatsiyasi qiziq ma'lumotni keltirib o‘tadi. Uning hisobotida aytilishicha, AESda bir gigavatt elektr energiyasi ishlab chiqarishda insonlarning qurbon bo‘lishi ko‘rsatkichi an'anaviy issiqlik elektr stansiyalarinikiga nisbatan 43 marta kam ekan[8,9].

Atom elektr stansiyalarining ustunliklariga quyidagilar kiradi:

- elektr energiyasi ishlab chiqarish arzonga tushadi;

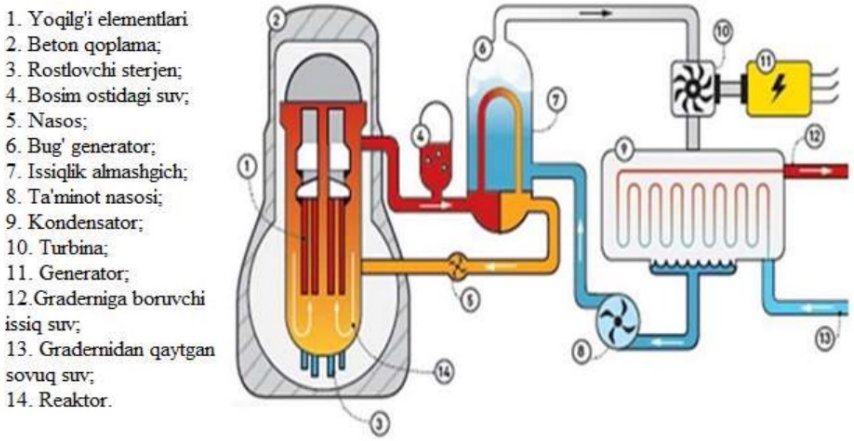
- gaz bilan ishlaydigan 1000 MVt quvvatga ega issiqlik elektr stansiyasi atmosferaga yiliga 13 ming tonna va ko‘mir bilan ishlaydigan issiqlik elektr stansiyasi 165 ming tonna zararli modda chiqaradi. 1000 MVt quvvatga ega IES yiliga 8 million tonna kislorod yutadi. AES kislorod iste'mol qilmaydi va yuqoridagidek zararli chiqindilar chiqarmaydi;
- ularni yirik yonilg‘i manbasi yaqinida qurish uchun zarurat yo‘q. IESga ko‘mir va gaz keltirish katta xarajatlarni talab qiladi, AESga kerakli uran esa bitta yuk mashinasiga joylashishi mumkin;
- foydalanilgan yonilg‘ini qayta ishlab, undan yana yonilg‘i sifatida foydalaniladi;
- yuqori quvvat: bitta energoblokning quvvati 1000—1600 MVtni tashkil qiladi.

AESning kamchiliklari. Har bir loyiha ijobiy xususiyatlar bilan birga kamchiliklarga ham ega bo‘ladi. AESlar ham bundan mustasno emas.

Atom elektr stansiyalari quyidagi kamchiliklarga ega:
- nurlangan yonilg‘i xavfli hisoblanadi, uni qayta ishlash va saqlash murakkab jarayon hamda ko‘p mablag‘ talab qiladi;
- AES qurish uchun katta mablag‘ va juda ko‘p suv kerak bo‘ladi;

Atom elektr stansiya (AES)-elektrostansiya bo‘lib, unda atom (yadro) energiyasi elektr energiyasiga o‘zgartiriladi. AES da energiya generatori bo‘lib atom reaktori xizmat qiladi. Bir qancha og‘ir elementlar yadrolari bo‘linishining zanjirli reaksiyasi natijasida reaktorda issiqlik ajraladi, keyin oddiy issiqlik elektr stansiyalari kabi elektr energiyaga o‘zgartiriladi.

Atom elektr stansiyalarining strukturaviy sxemasi keltirilgan (1.1-rasm)[7].



1.1-rasm. Atom elektr stansiyalarining strukturaviy sxemasi keltirilgan.

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QUYOSH FOTO ELEMENTLARI VA MODULLARINING ISHLASH PRINSIPINI TALILI

Annotatsiya: *Ushbu maqolada quyosh element larining ishlash prinsiplari va ularda kechadigan jarayonlar, quyosh elementlarini tayyorlanadigan materiallar ko`rib chiqilgan va tahlil qilingan.*

Kalit so`zlar: *quyosh elementlari, quyosh, nur, quyosh doyimiyligi.*

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ANALYSIS OF THE WORKING PRINCIPLE OF SOLAR PHOTOCELLS AND MODULES

Abstract: *In this article, the working principles of solar cells and their processes, the materials used to make solar cells are considered and analyzed.*

Key words: *solar elements, sun, light, solar permanence.*

Quyoshni gigant termoyadro reaktoriga qiyoslash mumkin. U mutlaq qora qattik jismga o'xshab 6000°S haroratda energiyasini nurlantiradi. Bu nurlanishning manbai termoyadro reaktsiyasidir. Har soniyada taqriban $6\ 10^{11}$ kg vodorod quyosh qa'rida geliyga aylanadi. Natijada massalar defekti $4\ 10^{3}$ kg teng bulib, $Ye=mc^2$ tenglamaga asosan ajralib chiqayotgan energiya $4\ 10^{20}$ joulga tengdir. Ajralib chiqayotgan energiya asosan elektromagnit to'lqinlar ko'rinishida bulib nurlanishning asosiy qismi 0,2-3 mkm oralikdadir. Quyoshning to'liq massasi hozirgi kunda taqriban $2\ 10^{30}$ kg bo'lib, u uzluksiz 10 mlrd. yil davomida turishi mumkin.

Yer quyosh atrofida elliptik orbitada harakatlanadi. Quyoshning diametri taqriban $1{,}39\ 10^{9}$ metrga teng. Bir astronomik birlikka teng masofadagi (1 a.b.=$1{,}496\ 10^{11}$ m, taqriban 150 mln.km) quyosh nurlariga perpendikulyar joylashgan yuzadagi energetik yoritilganlik, Quyosh doimiyligi (q.d.) deyiladi. Quyosh doimiysi kattaligi 1353 Vt/m² ga teng. Yil davomida Yer-Quyosh orasidagi masofa o'zgarishi q.d.ni 0,34 gacha o'zgarishiga olib kelishi mumkin.

Biz yer sirti albedosi hakida ham qisqacha ma'lumot berib o'tamiz. Uning sirtini o'rab turuvchi atrof muhitdan qaytgan nurlanish oqimining, unga tushayotgan oqimning nisbatiga aytiladi. Sirtdan diffuz qaytish uchun hisoblangan yer albedosining o'rtacha qiymati 0,34 ga teng[1,2].

Yer atmosfera massasi 1 ga teng deb olinsa, qaytgan nurning spektri yer sirtidagi quyosh nurlanishi spektriga aynan o'xshash deb hisoblanadi.

Yer atmosferasi o'zining optik xususiyatlariga asosan selektiv yorug'lik filtri bo'lib, koinotdan kelayotgan quyosh nurlanishini o'zgartiradi. Agar nurlanish oqimi atmosferadan o'tib yer sirtiga tik tushsa, u holda nurlanish bosib o'tgan optik masofa bir atmosfera massasiga teng deb hisoblanadi va AM1 bilan belgilanadi. Qiya tushayotgan nurlarning optik masofasi uzunligini ularning AM1 optik masofa kattaligiga qiyoslab aniqlash mumkin. Agar nurlanish oqimi atmosfera ta'sirida o'zgarmasa, uning optik atmosfera massasi nolga teng bo'lib, u AM0 deb belgilanadi[1].

To'g'ridan - to'g'ri tushayotgan Quyosh nurlanishi oqimining dengiz sathida qoq tush paytida ochiq havoda yer sirtidagi energetik yoritilganligi ≈100 mVt/sm² teng deb hisoblanadi.

Insolyatsiya deb, ma'lum geografik hududda Yer sirtiga tushayotgan Quyosh nurlanishining miqdoriga aytiladi. Insolyatsiya, Yer-Quyosh tizimida masofaning mavsumiy tebranishlariga, geografik kenglikka, hududning muhitiga va atmosfera massasiga bog'likdir. Insolyatsiyani odatda quyosh nurlanishining kunlik, oylik, yillik o'rtacha miqdori bilan ko'rsatiladi. Quyoshdan tushayotgan yorug'lik yarimo'tkazgichga tushganda uning xususiyatlarining o'zgarishini kuzatamiz[1]. Bu yarimo'tkazgichlar o'zi qanday moddalar?

Agar moddaning valent sohasi to'laligicha egallanmagan bo'lsayu, ammo o'tkazuvchanlik sohasigacha bo'lgan energetik masofa nisbatan kichik (2 eV dan kamroq) bo'lsa, bunday moddalar yarimo'tkazgich deyiladi. Yarimo'tkazgich xususiyatlari xususan elektr o'tkazuvchanligi tashqi muhitga, ayniqsa haroratga bog'liq bo'ladi. Harorat (T) ning ortishi elektronlar miqdorining valent va o'tkazuvchanlik soha orasida joylashgan man qilingan sohadan (E_g) o'tib o'tkazuvchanlik sohasiga o'tishda tok tashuvchilarning eksponentsial ravishda ko'payishiga va elektr o'tkazuvchanlikning (σ)

$$\sigma = A\exp(-E_g/2kT) \quad (1)$$

tenglamaga asosan o'zgarishiga olib keladi. Bu erda k– Boltsman doimiyligi, A – moddani xarakterlovchi o'zgarmas kattalik[3-4].

Metallarning elektr o'tkazuvchanligi erkin elektronlar konsentrattsiyasi o'zgarmas bo'lganligi tufayli elektronlar harakatchanligining haroratga bog'liqligi bilan aniqlanadi va haroratning ortishi bilan asta-sekin kamayadi. Yuqoridagi tenglamani logariflab quyidagi holda ifoda etamiz.

$$\ell n\sigma = \ell nA - E/2kT \quad (2)$$

Bu tenglamani yarim logarifmik koordinatalarda grafik ravishda ko'rsatish mumkin va hosil bo'lgan to'g'ri chiziq va uning φ burchakli tangensi yarimo'tkazgich materiallarning asosiy parametri bo'lgan, man qilingan soha kengligi bo'lgan $E_g = 2kT\varphi$ ni aniqlaydi. Ta'kidlash lozimki, qiya to'g'ri chiziq, ya'ni elektr o'tkazuvchanlikning logarifmi 1/T dan o'zgarishi faqat toza kirishmalardan holi, xususiy o'tkazuvchanlikka ega bo'lgan materiallar uchungina shunday ko'rinishga ega[2].

Kirishmali yarim o'tkazgichlarda lnG ning 1/T dan boglanishi murakkab bo'lib, u ikkita qiya to'g'ri chiziqdan iborat bo'lishi mumkin va bir-biri bilan gorizontal qism orqali tutashgan bo'ladi. Past haroaratli sharoitda o'lchash

natijasida olingan ℓnσ=ℓnA- E/2kT tenglamadan hosil qilingan qiya to'g'ri chiziq tangensi yordamida kirishmalarning man qilingan sohada joylashgan energetik sathlari holatini aniqlash mumkin. Yuqori haroratli sharoitda olingan hollarda esa yarimo'tkazgich matrialning man qilingan sohasi kattaligini, ya'ni Ye_g ni aniqlash mumkin.

QE tayyorlashda Quyosh nurlanishining yarimo'tkazgich material bilan o'zaro ta'siri, fotonlar energiyasi materialdagi elektronlarda yutilishi va chiqishi jarayonlari muhim ahamiyatga egadir.

Kvant mexanikasida elementar zarrachalar, shu jumladan elektronlar ham to'lqin xossalariga ham ega deb qaraladi. Shuning uchun elementar zarrachalar harakatini o'rganishda energiya (E) va impuls (R) bilan bir qatorda, ularning to'lqin uzunliklari λ va takrorlanuvchanligi ν va to'lqin vektori K=P/h, (h- Plank doimiyligi) ham ishlatiladi. Bu yerda E=h ν va P=h/ λ ga teng.

Kristallning sohali tuzilmasini E–K diagrammalar bilan tasvirlash mumkin. Bu yerda energiya elektron-voltlarda (eV) to'lqin vektori K – kristalli panjara doimiyligi qismlarida ko'rsatiladi, shu bilan birga K o'qida ko'rsatkichlar yordamida kristall orientattsiyasining yo'nalishi ko'rsatiladi. E–K diagrammasining ko'rinishi vositasida sohalararo o'tishlarning yarimo'tkazgich materialdagi xarakteri va jumladan o'tishning «to'g'ri» yoki «to'g'rimas»ligini aniqlash mumkin[3,4].

Optik yutilishni o'lchashdan aniqlangan E_g ning kattaligi, ko'pincha yarimo'tkazgich materialdagi erkin zaryad tashuvchilarning konsentrattsiya- siga, haroratga va kirishmalar energetik sathlarining man qilingan sohada mavjudligiga bog'liq bo'ladi. Agar o'tkazuvchanlik sohasi tubidagi va valent sohasi ustidagi holatlar zaryad tashuvchilar bilan to'ldirilgan bo'lsa, u xolda optik o'lchashlar natijasi kirishmali yarimo'tkazgichli materiallar uchun E_g sof xususiy materialga tegishli qiymatidan kattaroq bo'lishi mumkin[5].

Yarimo'tkazgich materialda yutilish koeffitsienti α odatda to'lkin energiyasining 1/ α masofada e marotaba kamayishi orqali aniqlanadi va u $N=N_o \exp(-\alpha\ell)$ dan topiladi, bu yerda N – yarimo'tkazgich materialda ℓ chuqurlikka kirgan fotonlar oqimining zichligi, N_o – material sirtini kesib o'tuvchi fotonlar oqimining zichligi.

Fotoelektrik effektga asoslangan yarimo'tkazgich materiallarda p-n o'tishli tuzilmalardan iborat QE da, ularga tushayotgan Quyosh nuri bevosita elektr energiyasiga aylantiradi. Shuning uchun, QE fotoqabullagich va fotoqarshiliklardan farqli ravishda tashqi kuchlanish manbaiga muhtoj emas[6]. Bu effekt yuz yildan ortiq vaqt davomida selen va mis oksidining fotoelektrik xususiyatlari sifatida o'rganib kelingan, ammo ularning foydali ish koeffittsienti (F.I.K.) 0,5 % oshmagan.

Bu muammoning nisbatan faol echilishi yarimo'tkazgich materiallar elektron tuzilishining soha nazariyasi yaratilganidan keyin, materiallarni kirishmalardan tozalash va nazoratli kirishmalar kiritish texnologiyasi, hamda p-n o'tishning nazariyasi yaratilishi bilan bog'liqdir[7].

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YADROVIY REAKTORLARNING SOVUTISH USULLARI

Annotatsiya: *Ushbu maqolada AES (Atom Elektr Stansiyasi) reaktorlarining samarali va xavfsiz ishlashi uchun ularni sovutish tizimi, reaktor sovutish tizimi yadro yonilg‘isidan ajraladigan issiqlikni olib chiqib, uni bug‘ turbinasi orqali elektr energiyasiga aylantirish imkonini beradi, shu bilan birga reaktor yadrosi qizib ketmasligi ko`rib chiqilgan va tahlil qilingan.*

Kalit so`zlar: *atom reaktori, elektr stansiyasi, elektr energiyasi, reaksiya*

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COOLING METHODS FOR NUCLEAR REACTORS

Abstract: *This article examines and analyzes the cooling system of NPP (Nuclear Power Plant) reactors for their efficient and safe operation. The reactor cooling system allows the heat released from the nuclear fuel to be removed and converted into electrical energy through a steam turbine, while preventing the reactor core from overheating.*

Key words: *nuclear reactor, power plant, electricity, reaction*

AES (Atom Elektr Stansiyasi) reaktorlarining samarali va xavfsiz ishlashi uchun ularni sovutish muhim rol o‘ynaydi. Reaktor sovutish tizimi yadro yonilg‘isidan ajraladigan issiqlikni olib chiqib, uni bug‘ turbinasi orqali elektr energiyasiga aylantirish imkonini beradi, shu bilan birga reaktor yadrosi qizib ketmasligini ta’minlaydi. Quyida AES reaktorlarida qo‘llaniladigan asosiy sovutish usullari keltirilgan:

Suvli sovutish tizimi (eng keng tarqalgan). Bu eng ko‘p qo‘llaniladigan usul bo‘lib, asosan quyidagi turlarda mavjud:

a) Engil suvli reaktorlar (Light Water Reactor – LWR)

- PWR (Pressurized Water Reactor) – bosimli suvli reaktor
  - Bosim ostidagi suv sovutgich sifatida ham, neytronlarni sekinlashtiruvchi (moderatordan) sifatida ham ishlatiladi.
  - Sovuq suv reaktor yadrodan o‘tadi, issiqlikni oladi, lekin qaynab ketmaydi.
  - Keyin issiqlik ikkilamchi konturdagi suvga o‘tkaziladi va u bug‘ga aylanadi.
- BWR (Boiling Water Reactor) – qaynaydigan suvli reaktor
  - Suv bevosita reaktor ichida qaynaydi va bug‘ga aylanadi.
  - Hosil bo‘lgan bug‘ to‘g‘ridan-to‘g‘ri turbinaga yuboriladi.

b) Og‘ir suvli reaktorlar (CANDU)

- Og‘ir suv (D_2O) sovutgich va moderator sifatida ishlatiladi.
- Yadro yonilg‘isidan issiqlikni olib chiqib, bug‘ hosil qilinadi.

Gaz bilan sovutish. a) CO_2 yoki Geliy gazli sovutgichlar

- AGR (Advanced Gas-cooled Reactor) – ilg‘or gazli reaktorlar
  - Uglerod dioksid (CO_2) issiqlik tashuvchi sifatida ishlatiladi.
  - Grafit moderator sifatida ishlatiladi.
  - Sovigan gaz qayta aylanish tizimiga yuboriladi.

b) HTGR (High Temperature Gas-cooled Reactor)

- Geliy gaz yuqori haroratlarda sovutgich sifatida ishlatiladi.
- Yuqori samaradorlikka ega va istiqbolli texnologiyalardan biri hisoblanadi.

Suyuq metall bilan sovutish. Bu turdagi sovutgichlar yuqori issiqlik o‘tkazuvchanlik xususiyatiga ega:

a) Suyuq natriy (Na), natriy-kaliy qotishmasi (NaK)

- Ko‘pincha tez neytronli reaktorlarda (Fast Breeder Reactor – FBR) ishlatiladi.
- Yuqori haroratda ishlaydi, bosim past bo‘ladi.
- Issiqlik almashinuvi samaradorligi yuqori.

b) Qo‘rg‘oshin va qo‘rg‘oshin-bismut qotishmalari

- Past radiatsiya faolligiga ega.
- Korroziyaga chidamli materiallar talab qiladi.
- Uzoq muddatli ishlashga mos keladi.

AES reaktorlarida sovutish tizimining tanlovi reaktor turiga, ishlash rejimiga, xavfsizlik talablariga va iqtisodiy samaradorlikka bog‘liq. Eng keng tarqalgan usul – suvli sovutish tizimi, biroq yangi avlod reaktorlari suyuq metall yoki gaz bilan sovutish texnologiyalarini qo‘llash orqali yanada samaraliroq ishlashga yo‘naltirilmoqda.

Yuqori haroratli grafitli gaz bilan sovutilgan reaktorlar. An’anaviy va og’ir suv moderatorlaridan neytron moderatori sifatida grafitdan foydalanishning afzalligi shundaki, bu holda yadroviy reaktorning yuqori haroratiga erishish mumkin. Bundan tashqari, grafit og’ir suvdan arzonroq va yengil mexanik kuchga ega, bu yadro reaktorining dizaynini soddalashtiradi. Past neytron yutilish kesimi va grafitning yaxshi mo’tadil xususiyatlari termal neytron yadro reaktorlariga tabiiy urandan (boyitilmasdan) yadro yoqilg’isini ishlatishga imkon beradi. Shu bilan birga, parchalanadigan materialning past miqdori (0,7% uran-235) tabiiy uran bilan ishlaydigan reaktorlarda yadro yoqilg’isi yonish darajasining past bo’lishiga olib keladi. Shu sababli gaz bilan sovutilgan reaktorlar boyitilgan urandan kuproq foydalanadi. Grafit moderatorli gaz bilan sovutilgan yadro reaktorlari rivojlanishning uch bosqichidan o’tdi: tabiiy uran metalidan yadro yoqilg’isi bo’lgan reaktorlar CO_2 gazli sovutgichli; CO_2 gazli sovutish suvi bilan UO_2 dioksidi shaklida boyitilgan urandan yadro yoqilg’isi bo’lgan reaktorlar; yuqori boyitilgan keramik yadro uran yoqilg’isi va geliyli sovutish suvi bilan yuqori haroratli reaktorlar[6].

Gazlar neytronni yutuvchi kesmalarga ega va reaktor chiqishida yuqori sovutish suvi haroratini olish imkonini beradi. Yadrosi gaz bilan sovutilgan uran-

grafit reaktoriga ega energiya tizimi yetarli darajada yuqori gaz haroratida yadro energiyasini mexanik energiyaga to'g'ridan-to'g'ri aylantirishning yopiq gaz turbinasi siklida ishlashi mumkin. Gaz sovutgichlari past zichlik va issiqlik quvvatiga ega, buning natijasida reaktor yadrosi orqali sovutish suvining massa oqimi oshadi, bu esa elektr stantsiyasining samaradorligiga salbiy ta'sir qiladi. Samarali real gaz turbinasi sikli, foydalaniladigan gazning tabiatiga qarab, uning bosimi oshirishning optimal darajasini talab qiladi, shunda samaradorlik maksimal bo'ladi. 200 Vt issiqlik quvvatiga ega bo'lgan gaz bilan sovutilgan birinchi uran-grafit yadro reaktorida havo konvektsiyasi bilan sovutish mavjud edi. Bunday reaktorlarining grafit yadrosi devor qalinligi 10 sm bo'lgan po'lat korpusga o'ralgan balandligi 10 m va diametri 15 m bo'lgan gorizontal silindr edi. Devor qalinligi 3 m bo'lgan oldindan zo'riqtirilgan temir-beton korpusga o'ralgan po'lat korpus bosimli korpusning ichki devori bo'lib xizmat qildi. Yadroning grafit devori yonilg'i tayoqchalari va sovutish suvini joylashtirish uchun kanallar bilan teshilgan. Yoqilg'i yadro reaktorini to'xtatmasdan ish paytida qayta yuklangan. Yadroning chiqishidagi sovutish suyuqligining harorati 414 ° C ga yetdi, bu yengil suvli yadro reaktorlariga qaraganda 100°C ga yuqori. Bug' gaz-suv issiqlik almashinuvchilarida ishlab chiqarilgan.

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YADRO REAKTORINING YOQILG'I TA'MINOTI

Annotatsiya: *Ushbu maqolada atom elektr stansiyalari va reaktorlarda yoqilg'i ta'minoti, sarflangan yadro yoqilg'isini radiatsion qayta ishlash va atom elektr stansiyasida kechadigan jarayonlar ko`rib chiqilgan va tahlil qilingan.*
Kalit so`zlar: *reactor yoqilg'isi, atom reaktori, elektr stansiyasi, elektr energiyasi, reaksiya*

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NUCLEAR REACTOR FUEL SUPPLY

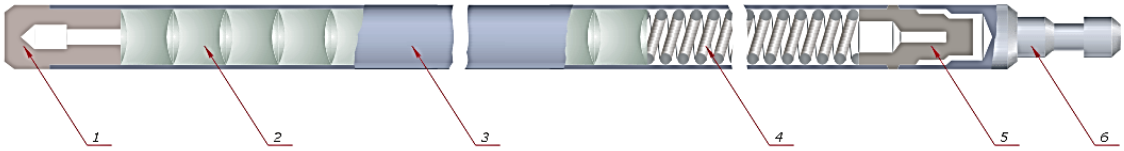
Abstract: *This article reviews and analyzes the fuel supply in nuclear power plants and reactors, the radiation reprocessing of spent nuclear fuel, and the processes occurring in a nuclear power plant.*
Key words: *reactor fuel, nuclear reactor, power plant, electric energy, reaction*

Yadro reaktori - bu parchalanish zanjiri reaktsiyasini saqlash va boshqarish uchun mo'ljallangan qurilma. Strukturaviy jihatdan reaktorlarni shartli ravishda idish va kanalga bo'lish mumkin[1].

Har qanday reaktorning zarur qismi faol zonadir. Geterogen termal neytron reaktorlarida yadro yoqilg'i agregatlaridan (FA), sovutish suvi va moderatordan iborat; tez neytron reaktorlari - yonilg'i agregatlari va sovutish suyuqligidan iborat. Ko'pgina hollarda, yonilg'i agregatlari uchburchak yoki kvadrat panjara bo'ylab koaksial tarzda joylashtirilgan, dumaloq, kvadrat yoki olti burchakli korpuslardan joy olgan koaksial halqali yonilg'i elementlari to'plamidir. Bo'linish zanjiri reaktsiyasini boshqarish uchun reaktor yadrosiga harakatlanuvchi boshqaruv tayoqchalari - neytron erituvchilari joylashtiriladi. Bunga qo'shimcha ravishda, reaktorni tezda o'chirish zarur bo'lsa, yadroga tushadigan favqulodda himoya tayoqlari taqdim etiladi[2].

Yoqilg'i elementi reaktorning asosiy tarkibiy qismi bo'lib, odatda yonilg'i yadrosi, qismlaridan iborat. Yoqilg'i tayoqchasi yadro yoqilg'isini joylashtirish, issiqlik hosil qilish va sovutish suviga o'tkazish uchun mo'ljallangan. Yoqilg'i elementi reaktorning eng muhim qismlaridan biridir. Yoqilg'i elementlari reaktorda bir necha yil davomida juda og'ir sharoitlarda ishlaydi (yuqori harorat va bosim, yuqori radiatsiya intensivligi, sovutish suvining korroziya va eroziya ta'siri), shuning uchun ularning ishonchliligiga yuqori talablar qo'yiladi. Yoqilg'i

elementlari turli shakllarga ega bo'lishi mumkin: silliq novda, xochsimon, halqasimon, qatlamli, sharsimon va boshqalar. Eng keng tarqalgan silliq novda yonilg'i tayoqlaridir. Shunday yonilg'i elementining dizaynini ko'rib chiqaylik (1-rasmga qarang). Yoqilg'i elementining asosiy qismi yadro bo'lib, novda yoki yadro yoqilg'isining granulalari to'plami shaklida ishlab chiqariladi. Tabletkalar va novdalar diametri 5-15 mm. Tabletkalarning uchlarida yoqilg'ining asosiy qismida issiqlik kengayishini qoplash uchun mo'ljallangan sharsimon chuqurchalar mavjud. Ba'zan planshetlar o'qi bo'ylab 1,4-1,6 mm diametrli teshiklar hosil bo'ladi (1.3-rasm).



1-rasm. RBMK reaktorining yonilg'i tayoqchasi: 1 - vilka, 2 - yonilg'i pelleti, 3 - g'ilof, 4 - buloq, 5 - vtulka, 6 – uchi.

Yoqilg'i elementi yonilg'i yadrosi muhrlangan silindrsimon metall qobiqga joylashtiriladi. Qoplama yonilg'ining sovutish suvi bilan aloqa qilishiga yo'l qo'ymaydi, bu esa radioaktiv parchalanish mahsulotlarini sovutish suvining aylanish pallasiga chiqishini, shuningdek yoqilg'ining korroziy va eroziv yo'q qilinishini oldini oladi. Yoqilg'i novdalarini yonilg'i agregatlariga ulash imkonini berish uchun oxirgi qismlar yuqori va pastdagi qoplamaga payvandlanadi. Yonilg'i bo'linishi jarayonida parchalanish mahsulotlari, shu jumladan gazsimon mahsulotlar (Kr , Xe va boshqalar) to'planishi va ularning bosimi vaqt o'tishi bilan ortib borishi sababli, gaz kollektoridan iborat yonilg'i elementi ichida kompensatsiya hajmi ta'minlanadi. Yoqilg'i yadrosi va yonilg'i elementini o'rab turgan sovutish suvi o'rtasida issiqlik o'tkazuvchanligini yaxshilash uchun yadro va yonilg'i elementi qoplamasi orasidagi bo'shliq geliy bilan to'ldiriladi, chunki uning issiqlik o'tkazuvchanligi gazlarning eng yuqori ko'rsatkichidir (vodoroddan tashqari)[3,4].

Yoqilg'i elementining qoplamasi yetarli kuchga ega bo'lishi va neytronlarni zaif singdirishi kerak. Odatda, qobiqning qalinligi, materialga qarab, 0,3-0,8 mm bo'ladi. Bundan tashqari, qobiq materiali yuqori issiqlik o'tkazuvchanligiga ega bo'lishi kerak, yoqilg'i va sovutish suvi bilan mos kelishi va korroziyaga chidamlilikka ega bo'lishi kerak. Bu talablar eng yaxshi sirkonyum qotishmalari tomonidan qondiriladi, ammo ular 350-400° S dan yuqori bo'lmagan haroratlarda ishlashi mumkin. Yuqori haroratlarda termal neytron reaktorlari zanglamaydigan po'latlardan foydalanadi, ular termal neytronlarni ancha kuchliroq yutadi. Tez neytron reaktorlari uchun zanglamaydigan po'latdan yasalgan strukturaviy material juda mos keladi, chunki barcha materiallar yuqori neytron energiyalari hududida neytronlarni zaif singdiradi.

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OLIY TA’LIMDA MATEMATIKA VA INFORMATIKA FANINI O'QITISHDA INNOVATSION TADQIQOT NATIJALARINI QO'LLASH

Annotatsiya: *Bugungi kunda ta'lim sohasi jadal sur’atlarda rivojlanib, raqamli texnologiyalar va innovatsion tadqiqotlar bilan chambarchas bog‘lanmoqda. Xususan, oliy ta'limda matematika va informatika fanlarini o‘qitishda yangi metodlarni qo‘llash zaruriyati dolzarblik kasb etmoqda. Bu fanlar o‘zining chuqur nazariy asosi va amaliy ahamiyati tufayli o‘quv jarayonida asosiy o‘rin tutadi.*

Kalit so`zlar: *Matematika, Informatika, LMS, Gamifikatsiya, interaktivlashtirish, ko‘p tarmoqli platformalar.*

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APPLICATION OF INNOVATIVE RESEARCH RESULTS IN TEACHING MATHEMATICS AND COMPUTER SCIENCE IN HIGHER EDUCATION

Abstract: *Today, the field of education is developing rapidly, closely connected with digital technologies and innovative research. In particular, the need to use new methods in teaching mathematics and computer science in higher education is becoming urgent. These disciplines, due to their deep theoretical basis and practical significance, play a key role in the educational process.*

Key words: *Mathematics, Informatics, LMS, Gamification, interactivity, multidisciplinary platforms.*

Oliy ta'lim tizimida matematika va informatika fanlarining ahamiyati:Oliy ta'limda matematika va informatika fanlari, nafaqat texnik fanlar balki tabiiy va ijtimoiy fanlar uchun ham asosiy poydevor hisoblanadi. Ushbu fanlar orqali talabalar abstrakt va analitik fikrlash qobiliyatlarini rivojlantiradilar, bu esa ularga kelajakda duch keladigan muammolarni yechishda katta yordam beradi. Ayniqsa, bugungi raqamli davrda informatika o'quvchilarning har bir sohada muvaffaqiyat qozonishlari uchun muhim ahamiyatga ega.

Matematika fundamental fan sifatida ko‘pgina boshqa fanlar, xususan, muhandislik, iqtisodiyot, fizika va statistik tahlil uchun asos bo‘lib xizmat qiladi. Talabalarning matematik bilimlari ularning muammolarni yechish qobiliyatini oshiradi, mantiqiy fikrlashni rivojlantiradi va analitik yondashuvni shakllantiradi.

Informatika esa nafaqat dasturlash va texnik bilimlarni, balki axborot texnologiyalari va sun’iy intellektni o‘rganish uchun asosiy vositadir. Bu fan bugungi kundagi barcha sohalarda, xususan, tibbiyot, moliya, fan va ishlab chiqarishda keng qo‘llanilmoqda. Shu sababli, informatikani innovatsion tadqiqotlar asosida o‘qitish orqali zamonaviy texnologiyalarga asoslangan bilimlarni shakllantirish muhimdir.[1]

Innovatsion tadqiqotlarni qo‘llash metodlari:Oliy ta'limda matematika va informatika fanlarini o‘qitishda innovatsion tadqiqotlarni qo‘llashning bir nechta samarali usullari mavjud. Bu usullar nafaqat o‘quv jarayonini yengillashtiradi, balki talabalarning chuqur bilim olishiga va ularning fanga bo‘lgan qiziqishlarini oshirishga xizmat qiladi.Interaktiv va raqamli texnologiyalardan foydalanish.Matematika va informatika fanlarini interaktiv ta'lim platformalari orqali o‘rgatish ko‘p foydali jihatlarga ega.Misol uchun,virtual laboratoriyalar, matematika uchun o‘yinlashtirish dasturlari, hamda onlayn o‘quv resurslari talabalarga nazariyani amaliyot bilan mustahkamlash imkoniyatini beradi. Dasturiy modellashtirish texnologiyalari, xususan, matematik modellar va algoritmlar talabalarga murakkab matematik jarayonlarni tushuntirishda katta yordam beradi.

Masofaviy o‘qitish tizimlari**:**Innovatsion tadqiqotlar asosida rivojlanayotgan masofaviy o‘qitish tizimlari hozirda ta'limni har qanday sharoitda davom ettirish imkonini bermoqda.[2] LMS (Learning Management Systems) kabi tizimlar yordamida talabalar o‘z vaqtlarida va qulay joyda darslarni o‘rganishlari mumkin. Shu bilan birga, masofaviy o‘qitishda foydalangan holda talabalarga turli xil raqamli vositalardan foydalanish imkoniyati yaratiladi.

Sun'iy intellekt va ma'lumotlar tahlili yordamida matematika va informatika fanlarini o‘qitishda personalizatsiya qilingan ta'lim imkoniyatlari kengaymoqda. Sun'iy intellekt talabalar qiziqishlari va bilim darajalariga qarab o‘quv jarayonini moslashtiradi. Bu esa talabalar uchun individual yondashuv orqali yanada samarali bilim olish imkonini yaratadi. Ma'lumotlar tahlili yordamida esa o‘quvchilarning o‘zlashtirish darajasi tahlil qilinadi va ularga mos resurslar tavsiya etiladi.

O‘yinlashtirish usullari**:**Ta'lim jarayoniga o‘yinlashtirish texnikasini kiritish ham katta samaradorlik beradi. Gamifikatsiya usuli talabalarni fanga qiziqtirishning samarali usullaridan biridir. Maxsus matematika yoki informatika o‘yinlari yordamida talabalar o‘z bilimlarini sinab ko‘rishlari va shu orqali bilimlarni yanada chuqurlashtirishlari mumkin.[3]

Innovatsion tadqiqotlarni ta'lim jarayonida qo‘llash natijasida ko‘plab ijobiy o‘zgarishlar kuzatilmoqda. O‘quv jarayonini interaktivlashtirish talabalarning darslarga qiziqishini oshiradi va bilimni mustahkamlashga yordam beradi. Masofaviy o‘qitish va sun'iy intellekt texnologiyalari orqali individual yondashuv ta’minlanib, har bir talabaning qobiliyati va ehtiyojlariga mos ta’lim beriladi.Natijada:Talabalarning bilimlari oshadi, ular nafaqat nazariy bilimlarga ega bo‘ladi, balki ularni amaliyotda qo‘llashga tayyor bo‘ladilar.

Innovatsion yondashuvlar mustaqil fikrlash va ijodiy yondashuv ko‘nikmalarini shakllantiradi, bu esa ularni kelajakdagi kasbiy faoliyatida muvaffaqiyatli bo‘lishiga asos yaratadi.

O‘quv jarayonining samaradorligi zamonaviy texnologiyalar bilan boyitiladi, bu esa darslarni yanada qiziqarli va maqsadga yo‘naltirilgan qiladi.[4,5]

Innovatsion tadqiqotlar orqali matematika va informatika fanlarini o‘qitish istiqbollari keng imkoniyatlarni ochadi. Yangi texnologiyalar va o‘qitish usullarining rivojlanishi ta’lim jarayonlarini yanada samaraliroq qilish imkonini beradi. Masalan, blokcheyn texnologiyasi yordamida ta’lim jarayonini xavfsiz va shaffof qilish, virtual va kengaytirilgan haqiqat texnologiyalari orqali esa matematik va informatik tushunchalarni yanada chuqurroq tushuntirish mumkin.Kelajakda oliy ta’limda:Personalizatsiya qilingan o‘qitish tizimlari yanada rivojlanadi, bu esa har bir talabaga individual yondashuvni takomillashtirishga yordam beradi.

Xalqaro tajribalardan foydalanish orqali ilg‘or metodlar va innovatsion texnologiyalarni mahalliy ta’lim tizimiga joriy qilish ko‘zda tutiladi.[6,7]

Ko‘p tarmoqli platformalar yordamida matematik modellar va algoritmlarni o‘rgatishning interaktiv usullari kengaytiriladi.

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REAKTORLARDA SARFLANGAN YADRO YOQILG'ISINI RADIATSION QAYTA ISHLASH

Annotatsiya: *Ushbu maqolada atom elektr stansiyalari va reaktorlarda sarflangan yadro yoqilg'isini radiatsion qayta ishlash va atom elektr stansiyasida kechadigan jarayonlar ko`rib chiqilgan va tahlil qilingan.*
Kalit so`zlar: *atom reaktori, elektr stansiyasi, elektr energiyasi, reaksiya*

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NUCLEAR POWER PLANTS AND THEIR OPERATING PRINCIPLES

Abstract: *This article reviews and analyzes the radiation reprocessing of spent nuclear fuel in nuclear power plants and reactors and the processes occurring in a nuclear power plant.*
Key words: *nuclear reactor, power plant, electricity, reaction*

Yadro yoqilg'isining haddan tashqari ko'p to'planishidan, radiotoksiklikning pasayishi va yo'q qilinadigan chiqindilar miqdoridan qutulish uchun radikal yo'l bu uni uran va plutoniyni qazib olish bilan qayta ishlash va uni yangi ishlab chiqarilgan yoqilg'ida ishlatish (yoqilg'ini qayta ishlash). Ushbu stsenariyni amalga oshirish jarayonida uran va plutoniyning asosiy qismi (99,9%) sarflangan yadro yoqilg'isidan olinadi va ularning ozgina qismi yuqori darajadagi faoliyat chiqindilarida qoladi, ular geologik omborda yakuniy saqlash uchun yuboriladi.

1985 yildan beri ishlatilgan yadro yoqilg'isini qayta ishlash jarayonida olingan plutoniyni qayta ishlash sanoat amaliyotiga aylandi. Aralashgan uran-plutonium oksidi yoqilg'isining yoqilg'i aylanish jarayonida ishlatiladigan yoqilg'i bilan ishlov berish bilan ishlatilishi G'arbiy Evropada sanoat ahamiyatiga ega. PuOning ortib borayotgan miqdori yoqilg'isiga aylantirildi va Frantsiya, Germaniya, Shveytsariya va Belgiyada litsenziyalangan reaktorlarda ishlatildi. Rossiyada yoqilg'isini ishlab chiqaradigan zavod qurilmoqda.

Laboratoriyada sarf qilingan yadro yoqilg'isidan olingan plutoniydan foydalanish uran zaxiralarini qayta ishlatish va yadroviy avlod davomida vujudga kelgan uzoq umr ko'rish qobiliyatini kamaytirish global stsenariysining birinchi bosqichidir. Ushbu potentsialdan to'liq foydalanish uran yoqilg'isining aylanish sxemasiga, shu jumladan yadro energiyasini ishlab chiqaradigan tuzilishga bog'liq. Plutoniyni yoqilg'isi sifatida qayta ishlash qiymati keyinchalik atom elektr

stantsiyalarida elektr energiyasining qo'shimcha ulushini yaratish hisobiga qoplanadi.

Pu-ni SNF-dan ajratish, qolgan chiqindilarning uzoq muddatli radiotoksikligini nazariy jihatdan 10 baravar kamaytiradi. Uranni o'z mahsulotidan ajratib olish SNF radiotoksikatsiyasiga nisbatan ozgina hissa qo'shadi. Agar biz SNF - RW deb hisoblasak, unda plutoniyni qayta ishlash chiqindilarning radio-toksikligini ~ 3 baravar kamaytiradi. Plutoniyni qayta ishlashning eng oddiy usuli aralash suv oksidi (U, Pu) O_2 yoqilg'isini engil suv reaktorlarida ishlatishdir.

1.1-jadval

Aralashgan uran-plutoniy yoqilg'isi bilan ishlangan LWR reaktor tizimidagi bir nechta inqiloblardan keyin plutoniyning izotop tarkibi

Izotopning massa soni Pu	Nurlangan uran yoqilg'isining boshlang'ich tarkibi %	Izotopik tarkibi, massa bo'yicha %				
		1-burilishdan keyin	2-burilishdan keyin	3-burilishdan keyin	4-burilishdan keyin	5-burilishdan keyin
238	1	1,5	2	2	2,5	3
239	56	46	42	40	39	38
240	26	30,5	32	32,5	33	33,5
241	12	14	14,5	15	14,5	14
242	5	8	9,5	10,5	11	11,5

Hali ham uni 241Am (241Pu → 241Am) dan tozalash zarurati bo'lmaganida, yoqilg'isini ishlab chiqarish uchun energiya plutoniyidan (sarflangan yadro yoqilg'isidan VVER tipidagi reaktorlardan foydalanish) foydalanish tavsiya etiladi, ya'ni. SNFni qayta ishlashdan keyingi dastlabki uch yil davomida. Yoqilg'i majmuasi shaklida yoqilg'isi VVER tipidagi reaktorlarning yadro yukining 1/3 qismidan oshmasligi kerak. Ushbu cheklov shundan iboratki, katta miqdordagi yoqilg'isini yuklashda neytron energiya spektri yanada qattiqlashadi, shuning uchun reaktivlikni qoplash uchun sovutish suviga kiritilgan nazorat panellari va boronlarning materialidan neytron yutilishi kamayadi.

MOX yoqilg'isi yig'ilishida nurlanishdan oldin 35 kg plutoniy va nurlanishdan keyin 25 kg. Har bir yig'ishda 10 kg bo'lgan plutoniy iste'moli UO2 oksidi yoqilg'isining standart yig'indisida taxminan 5 kg plutoniy ishlab chiqarish bilan taqqoslanishi kerak.

Hozirgi vaqtda Frantsiya, Germaniya, Shveytsariya va Belgiyadagi ko'plab reaktorlar MOX yoqilg'isining 30% yadro (A_3) bilan ishlaydi. Bunday holda, A3 reaktorida ishlab chiqarilgan plutoniy miqdori 2TVS × 5 kg - 1TVS × 10 kg = 0, ya'ni. nol balans ichida bo'lish.

A_3 reaktoridagi MOX-yonilg'i to'plamlari miqdorining 100% ga ko'payishi plutoniyni iste'mol qilishga olib keladi, ammo bu A3 reaktoridagi moderator / yoqilg'i nisbati o'zgarishini talab qiladi. Pu iste'molining yuqori darajasiga inert-matritsali yoqilg'i bilan erishish mumkin, chunki yonilg'ida 238U plutoniy bor. Biroq, inert matritsaning mavjudligi yonilg'ining Doppler koeffitsientiga ta'sir

qiladi, chunki 238Uda neytronning yutilish rezonansi yo'q. VVER tipidagi reaktorlarni yoqilg'isi bilan to'liq yadrolarni yuklashga o'tkazish uchun boshqarish marjasini oshirish uchun faqat kichik dizayn o'zgarishlari talab qilinadi, chunki boshqaruv ustunlarining samaradorligi dastlabki qiymatdan 80% gacha kamayadi. To'liq yukning afzalliklaridan biri yuqori yoqilg'ini yoqishdir.

Issiq suvli reaktorlarda (LWR) qayta ishlash bosqichlari soni termal neytron spektrida bo'linmaydigan va o'z-o'zidan ajraladigan neytronlar emitentlari bo'lgan plutoniy izotoplari kontsentratsiyasining oshishi sababli cheklangan (1.1-jadval).

ADABIYOTLAR:

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ALTERNATIV ENERGIYA MANBAI – QUYOSH ENERGIYASI

Annotatsiya*: Quyosh energiyasi - bu qayta tiklanadigan energiyani quyosh nuridan elektr energiyasiga aylantirish jarayoni. Ko'pincha quyosh paneli yorug'likni elektr tokiga aylantirish uchun fotovoltaik effektdan foydalanadi, bu to'g'ridan-to'g'ri ishlatilishi yoki keyinchalik foydalanish uchun batareyada saqlanishi mumkin.*

Kalit so'zlar*: Fotoelektr element, fotoeffekt, potentsial farq, batareya, quyosh energiyasi.*

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ALTERNATIVE ENERGY SOURCE-SOLAR ENERGY

Annotation: *solar energy is the process of converting renewable energy from sunlight to electricity. Often the solar panel uses a photovoltaic effect to convert light into electric current, which can be used directly or stored in the battery for later use.*

Keywords: *photoelectric element, photoeffect, potential difference, battery, solar energy.*

Jahon va O'zbekistonda quyosh energiyasi hajmi. 2024-yil oxiriga kelib, dunyoda o‘rnatilgan quyosh energiyasi quvvati 1448 Gvtdan oshadi. 2023-yilda O‘zbekistonda Surxondaryo viloyatining Sherobod tumanida quvvati 457 MVt bo‘lgan o‘rnatilgan quyosh fotoelektr stansiyasi foydalanishga topshirildi;

- Samarqand viloyati Kattaqo‘rg‘on tumanida 220 MVt quvvatga ega quyosh stansiyasi; [1].
- Jizzax viloyati G'allaorol tumanidagi 220 MVt quvvatga ega quyosh stansiyasi.

O‘zbekistonda 2024-2025 yillar oxirigacha umumiy quvvati 2,7 GVt bo‘lgan yana 6 ta quyosh elektr stansiyasi ishga tushiriladi.

Birinchi tajribalar. Quyosh energiyasi - bu qayta tiklanadigan energiyani quyosh nuridan elektr energiyasiga aylantirish jarayoni. Ko'pincha quyosh paneli yorug'likni elektr tokiga aylantirish uchun fotovoltaik effektdan foydalanadi, bu to'g'ridan-to'g'ri ishlatilishi yoki keyinchalik foydalanish uchun batareyada saqlanishi mumkin. [1,2]. Quyosh energiyasi quvvati. Har kvadrat metr uchun quyoshdan 1367 vatt energiya keladi (quyosh doimiysi). Taxminan 1020 Vt / m² atmosfera orqali (ekvatorda) erga etib boradi, ammo bu o'rtacha qiymatdir. Bulutli havoda quyosh radiatsiyasi ancha kam ekanligini unutmasligimiz kerak. Qishda mo"tadil kengliklarda qiymat ikki baravar past bo'ladi.

Yiliga o'rtacha qancha elektr energiyasi ishlab chiqarilishi mumkinligini aniqlash uchun quyosh batareyasining turi hisobga olinadi:

• Yerga parallel
• Optimal burchak ostida
• Quyosh kuzatuvi bilan [3].

Quyoshdan energiya olish usullari. Elektr stantsiyasining asosiy ishlash printsiplari quyidagilardan iborat:

1. O'rnatilgan quyosh panellari (quyosh modullari) orqali quyosh energiyasini olish;

2. Iste'molchini uzluksiz elektr energiyasi bilan ta'minlaydigan batareyalarni qayta zaryadlash;

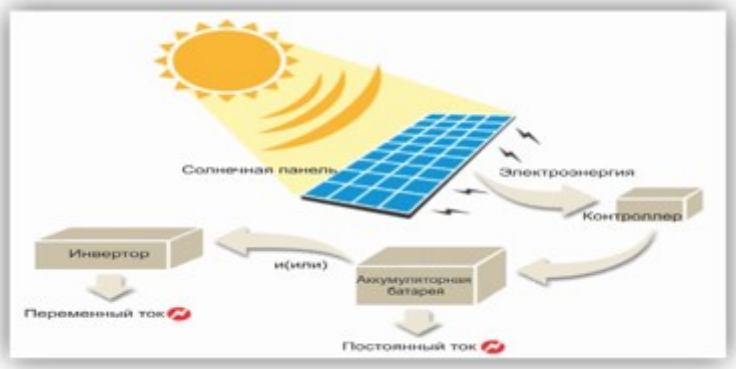
3. Iste'mol tarmog'ini energiya bilan ta'minlash;

4. Ortiqcha energiyani asosiy elektr ta'minoti tarmoqlariga tushirish (agar bunday tarmoq mavjud bo'lsa).

Quyosh energiyasining kamchiliklari va afzalliklari qanday? Afzalliklar. Qayta tiklanadigan An'anaviy energiya turlariga narxlarning doimiy o'sib borishi, atrof-muhit uchun to'liq xavfsizlik sharoitida energiya manbasining istiqbollari, mavjudligi va tugamasligi. Energiya ishlab chiqarish jim, chunki dvigatellar yoki generatorlar yo'q. [4].

Kamchiliklar. Noyob elementlardan foydalanish bilan bog'liq qurilishning yuqori narxi Ob-havo va kunning vaqtiga bog'liqligi.

Shamol yordamida elektr energiyasini olish, suvning mexanik energiyasidan foydalangan holda elektr energiyasini olish, hayvonlarning chiqindilari va quyosh nurlaridan moddalarning kimyoviy reaktsiyasi natijasida organik moddalardan elektr energiyasini olish mumkin. Ular orasida quyosh nuridan foydalangan holda elektr energiyasini ishlab chiqarishning qulay usullaridan biridir. Quyosh nuri chastotali elektromagnit energiya bo'lib, ko'rinadigan yorug'likning to'lqin uzunligi l=0,38÷0,78 mkm (1-rasm). [5,6]. Quyosh nurini elektr energiyasiga aylantiradigan hujayralar fotovoltaik hujayralar deb ataladi. Fotovoltaik hujayralar uchun ishlatiladigan materiallar selen, kremniy va galliy arseniddir. gacha chiqish voltaji Selen va kremniydan tayyorlangan fotoelektr elementidan 0,45÷0,6 V, galliy arsenididan tayyorlangan fotoelektr elementdan 0,87 V gacha olish mumkin.



Quyosh nuri
1-rasm

Fotovoltaik element quyidagicha amalga oshiriladi: ikkita yupqa kremniy plastinadan birida ko'pchilik zaryad tashuvchilar elektronlar (n) va ozchilik zaryad tashuvchilari teshiklardir (p). Ikkinchi plastinkada ozchilik zaryad tashuvchilar elektronlardir (n). Agar ular bir-biriga yopishtirilgan bo'lsa, u holda o'rta qismda diffuziya natijasida kristalning asosiy zaryad tashuvchilari n bo'lgan chegara qismida musbat qatlam hosil bo'ladi va kristallning chegara qismida salbiy qatlam hosil bo'ladi. asosiy zaryad tashuvchilar p, ya'ni kristallarning chegara qismida p-n qatlam hosil bo'ladi. Yorug'lik dastasi plastinkaga 900 burchak ostida tegsa, n mintaqadagi teshiklar p mintaqaga, p mintaqadagi elektronlar esa n mintaqaga o'tadi. Natijada, kristallarda bir xil belgidagi zaryadlarning konsentratsiyasi oshadi, potentsial farq paydo bo'ladi, bu esa elektr o'tkazuvchi kuchning oshishiga olib keladi.

So'nggi paytlarda quyosh batareyalari narxining nisbiy pasayishi kremniyni olish jarayonini takomillashtirish bilan bevosita bog'liq. Masalan, sof yarimo'tkazgich xossalariga ega bo'lgan kremniy olish uchun kremniy dioksididan qaytarilish usuli ishlab chiqilgan. Doimiy ravishda o'sib borayotgan kremniy chiziqlar uchun usul yaratildi. Muqobil energiya odatda qayta tiklanadigan energiya manbalari hisoblanadi. Bu, asosan, quyosh va shamol energiyasidan, dengiz to'lqinlari va oqimlarining energiyasidan, shuningdek, boshqa usullardan foydalangan holda elektr energiyasini ishlab chiqarishdir.

Bugungi kunda tez sur'atlar bilan foydalanilayotgan muqobil energiya manbalari quyosh va shamol energiyasidir. Bu ikki turdagi energiya manbalari Yerning deyarli barcha hududlarida rivojlanmoqda. Shuningdek, qirg'oq mamlakatlarida dengiz to'lqinlari va dengiz oqimlari energiyasidan foydalanish amaliyoti mavjud va ba'zi mamlakatlarda (Xitoy, Indoneziya, Islandiya, Frantsiya va boshqalar) ularning kamchiliklari zamonaviy texnologiyalar sharoitida nisbatan yuqori narxni o'z ichiga oladi.

Xulosa qilib aytganda, quyosh panellarining afzalligi shundaki, ularning samaradorligi saqlanib qolishi mumkin o'nlab yillar davomida o'zgarmagan holda, ular ish paytida shovqin va emissiya yaratmaydi. Ba'zi yuqori samarali panellarda zararli kimyoviy moddalardan foydalanishdan tashqari, umumiy foydalanish

panellari ekologik jihatdan qulay hisoblanadi. Ular osongina va arzon narxlarda har qanday joyda, uyingizda, hovlida, ko'chada va hatto vaqtinchalik boshpanalarda o'rnatilishi mumkin, agar kerak bo'lsa, yig'iladi va boshqa joyga ko'chiriladi.

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BIR FAZALI IKKITA CHIQISH KUCHLANISHLI TO‘G‘IRLAGICHLAR

Annotatsiya*: ushbu maqolada bir fazali ikkita chiqish kuchlanishli to‘g‘irlagichlar haqida ma’lumotlar keltirilgan bo’lib, sxemalar va jadvallar orqali mavzu to’liq yoritilgan.*

Kalit so‘zlar: *Ikki chiqishli to‘g’irlagich, yarimo’tkazgichli diod, sig’im, vaqt diagrammasi, zaryadlanish, razryadlanish, pulsatsiya koeffitsiyenti.*

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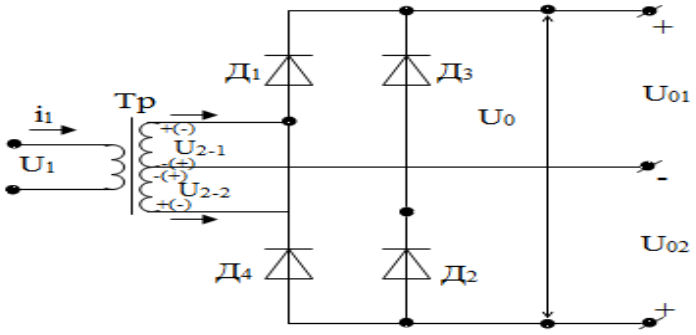
SINGLE PHASE TWO OUTPUT VOLTAGE RECTIFIERS

Annotation: *this article provides information about two single-phase output voltage rectifiers, and the topic is fully covered through schemes and tables.*

Keywords: *two-output rectifier, semiconductor diode, capacitance, time diagram, charge, discharge, pulsation coefficient.*

Ikkita chiqishli to‘g‘rilagich bitta kirish kuchlanishi orqali chiqishda ikkita o‘zgarmas kuchlanish olish mumkin bo‘lgan to‘g‘rilagich orqali amalga oshiriladi. Ishni bajarish davomida quyidagi elektron komponentlar ishlatiladi. Ikkita chiqishli to‘g‘rilagich to’g’rilagichlar bir vaqtning o‘zida ikkita istemolchini kuchlanish va tok bilan ta‘minlashda yuklamalarga manba sifatida xizmat qiladi.

Quyidagi sxemada (1-rasm) transformatorning ikkilamchi chulg‘amidagi nol chiqishga nisbatan ikkita xar xil ishorali kuchlanish olinadi, ya’ni U_{01}, U_{02} Bu sxema ikkita nol chiqishli ikki yarim davrli to‘g‘rilagichlarni birlashtirishdan hosil bo‘lgan deb qarash mumkin (biri D_1, D_3 diodlar orqali, ikkinchisi D_2, D_4)



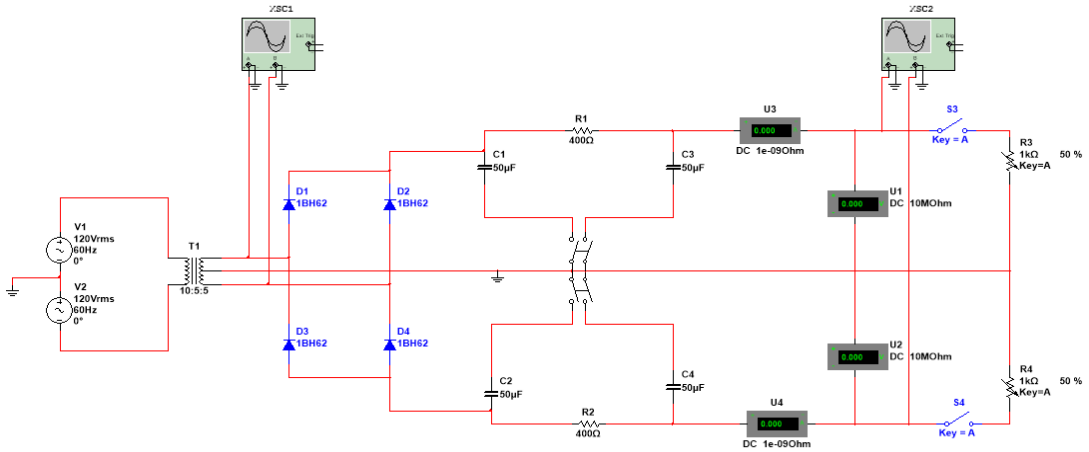
1- rasm. Bir fazali ikkita chiqish kuchlanishli to‘g‘rilagich.

Chiqishdagi kuchlanishlar U_{01}, U_{02} bir biriga ya'ni $\frac{U_0}{2}$ teng bo'ladi. Bu sxemaning ishlash jarayoni esa ikki yarim davrli nol chiqishli to'g'rilagichning ishlash prinsipiga o'xshab ishlaydi.

Transformatorning ikkinchi chulg'amining birinchi bo'limi orqali D_1 diodning anodiga musbat potensial kelganda undan tok o'tadi va birinchi chiqishda U_{01} kuchlanish hosil bo'ladi. bu vaqtda transformatorning ikkinchi chulg'amidan musbat potensial yuklama orqali D_2 dioddan tok o'tadi va chiqishda U_{02} kuchlanish hosil bo'ladi. transformatorning ikkinchi chulg'amidagi kuchlanishlar ishorasi tarmoqdagi kuchlanish chastotasiga mos ravishda o'zgarganda transformatorning ikkinchi chulg'amidagi ikkinchi bo'limidan oqqan tok D_3 orqali o'tadi va chiqishda U_{01} kuchlanish hosil bo'ladi. transformatorning ikkinchi chulg'amining birinchi bo'limidan D_4 orqali tok oqadi va ikkinchi chiqishda U_{02} kuchlanish hosil bo'ladi.

Ikkita chiqishli to'g'rilagich bitta kirish kuchlanishi orqali chiqishda ikkita o'zgarmas kuchlanish olish mumkin bo'lgan to'g'rilagich orqali amalga oshiriladi. Ishni bajarish davomida quyidagi elektron komponentlar ishlatiladi. ABM1, ABM2, ABM3, ABM4, D_1, D_2, D_3, D_4, = KD103A (D223), R_{f1}=R_{f2}= 400 Om, C_{f1}=C_{f2}=C_{f3}=C_{f4}=50 mkF, R_1=R_{yuk}=1kOm (o'zgaruvchan elektr tok kuchlanishi. Ishning bajarish tartibi quyidagi usulda olib boriladi:

2- rasmdagi prinsipial sxemaga kerakli elementlar kirgiziladi va manba (12V) o'lchov asboblari ulanadi;



2-rasm. Ikkita chiqish kuchlanishli to'g'rilagichning prinsipial sxemasi

To'g'rilagichni birinchi chiqishidan U_{chiq} R_{yuk1} orqali o'zgartirilib I_{chiq1} ni o'zgarishi filtrsiz va filtr orqali o'zgarishi 1-jadvalga yoziladi.

1- jadval

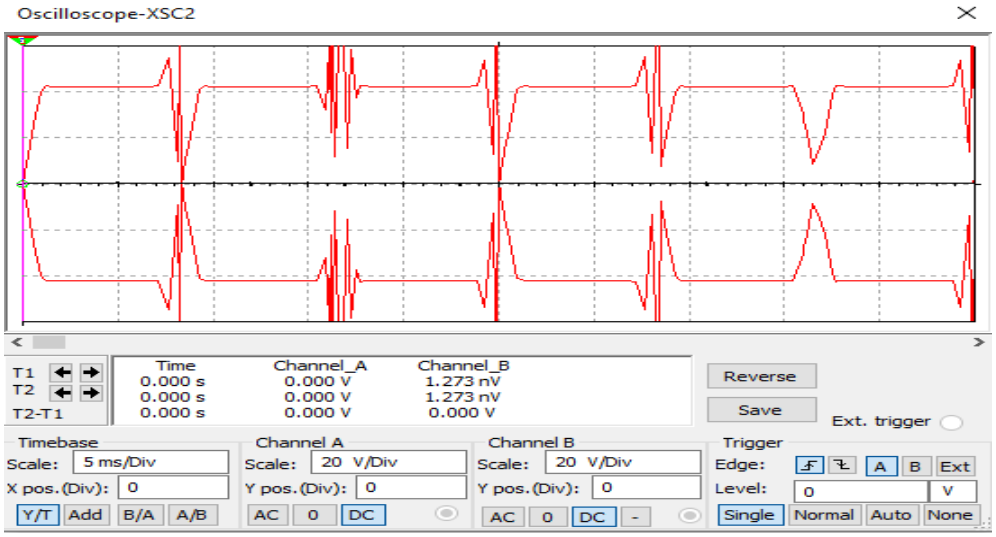
Parametrlar	Filtrsiz					Filtr bilan				
U_{yuk1}, V	18.5	27.7	33.5	37	39.9	25.35	29.5	35.5	39.4	42.3
I_{yuk1}, mA	92	69	56	46	40	84	74	59	49	42

To‘g‘rilagichni ikkinchi chiqishidagi U_{chiq2} ni R_{yuk2} orqali o‘zgartirilib I_{chiq2} tokni o‘zgarishi filtrsiz va filtr orqali bo‘lgandagi natija 2- jadvalga yoziladi.

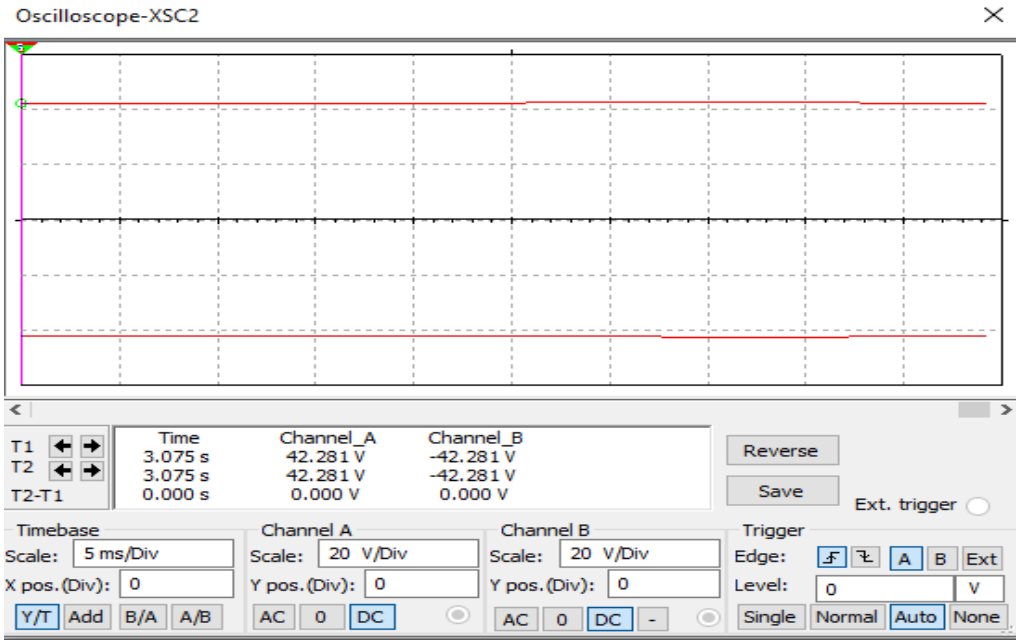
2-jadval

Parametrlar	Filtrsiz					Filtr bilan				
U_{yuk2}, V	18.5	27.7	33.5	37	39.9	25.35	29.5	35.5	39.4	42.3
I_{yuk2}, mA	92	69	56	46	40	84	74	59	49	42

Ossillograf orqali yuklamadan maksimal tok oqqanda chiqish kuchlanishi shakli kalkaga ko‘chirib olinadi. Buning uchun ossillograf ekranida to‘g‘rilagichni filtrsiz va filtr orqali ulangan sxemasidagi chiqish kuchlanishi shakli to‘xtatib ko‘chiriladi.



3-rasm. Filtrsiz va filtr orqali ulangan sxemasidagi chiqish kuchlanishichizmasi



3-rasm. To‘g‘rilagichni filtrsiz va filtr orqali ulangan variantini tashqi xarakteristikasi chizig’i natijasi

1, 2- jadvaldan foydalanib to‘g‘rilagichni filtrsiz va filtr orqali ulangan variantini tashqi xarakteristikasi chiziladi.

Quyidagicha xulosa chiqariladi. Ikkita chiqishli to‘g‘rilagichda bitta kirish kuchlanishi mavjud. Yuqoridagi ishlarga amal qilinib chiqishda ikkita o‘zgarmas kuchlanish olish mumkin, to‘g‘rilagich orqali ikkita iste’molchiga manba sifatida xizmat qilish amalga oshiriladi.

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KUCHLANISHNI IKKI BAROBAR OSHIRUVCHI SIMMETRIK TO'G'IRLAGICH

Annotatsiya*: ushbu maqolada kuchlanishni 2 barobar oshiruvchi simmetrik to'g'irlagichlar haqida ma'lumotlar yoritilgan.*
Kalit so'zlar: *Kuchlanishni oshirish, sig'im, simmetrik, nosimmetrik, vaqt diagrammasi, zaryadlanish, razryadlanish.*

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SYMMETRIC CORRECTOR THAT DOUBLES THE VOLTAGE

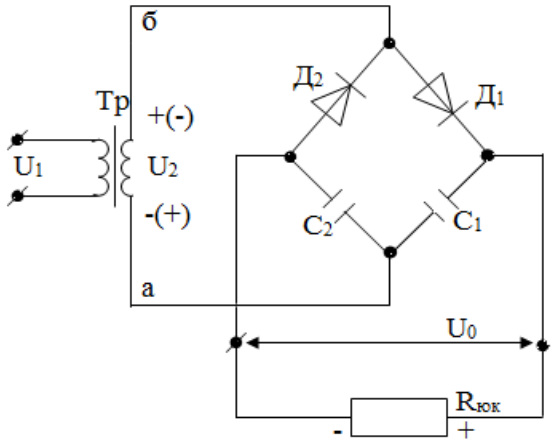
Annotation: *this article covers information about symmetric correctors that increase voltage by 2 times.*
Keywords: *voltage increase, capacitance, symmetric, symmetric, time diagram, charging, discharge.*

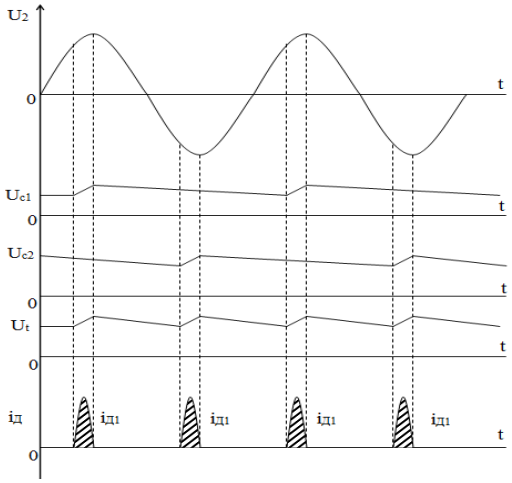
Kuchlanishni 2 barobar oshiruvchi to'g'irlagichlar yuqori kuchlanish va kichik tokda ishlaydigan yuklamalarga manba sifatida xizmat qiladi hamda yuklamaga 1 kV gacha kuchlanish kerak bo'lganda ishlatiladi.

Bu xildagi to'g'irlagichlarning ishlash prinsipi quyidagicha: to'g'irlagichga ulangan chiqish sig'imi bir yoki bir nechta bo'lib, ishlash jarayonida sig'imga yig'ilgan kuchlanish yuklamaga beriladi, ya'ni elektr energiya yuklamaga razryadlanadi.

Kuchlanishni oshiruvchi to'g'irlagichlar simmetrik va nosimmetrik guruhlarga bo'linadi. Kuchaytirishni karrali ko'paytirish cheklangan emas, ammo amaliy jihatdan 2 barobar bo'lishi mumkin. Xususiy hollarda yuklama kam tok iste'mol qilganda (n) karrali oshirish 100 gacha borishi mumkin.

Kuchlanishni ikki barobar oshiruvchi simmetrik to'g'irlagich sxemasi 1- a rasmda, tok va kuchlanish diagrammasi 1- b rasmda keltirilgan.





1-a rasm 1- b rasm

Birinchi yarim davrda D_1 diod ochiq va S_1 sig'im zaryadlanadi. Ikkinchi yarim davrda S2 sig'im D2 diod orqali zaryadlanadi. Yuklamadagi kuchlanish U0 birinchi va ikkinchi sig'imdagi kuchlanishlar yig'indisiga teng: Uo=2

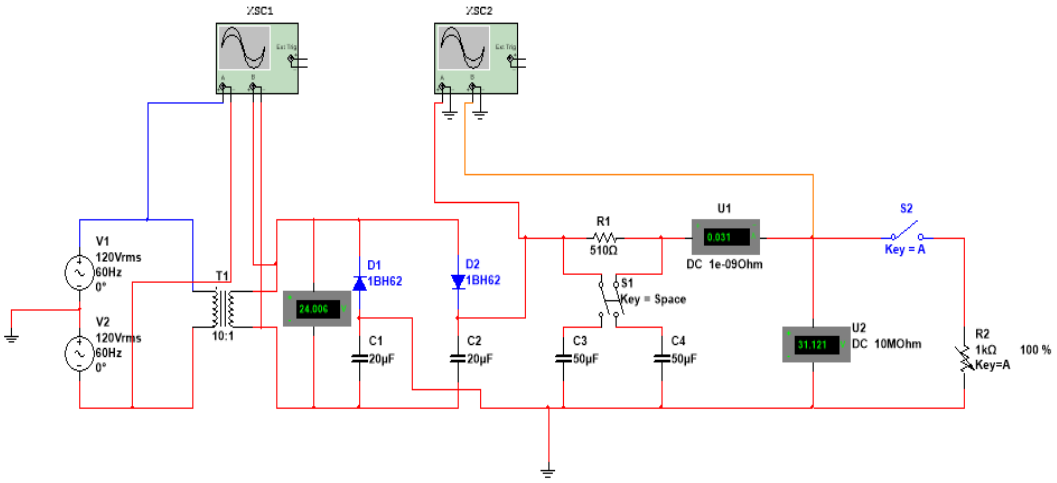
U C_1+U C_2 Yuklamadagi to‘g’rilangan kuchlanish pulslanish chastotasi tarmoqdagiga nisbatan ikki barobar ko‘p bo’ladi: n

Kirishdagi kuchlanish o‘zgarmagan holda chiqishdagi kuchlanishni oshirib o‘zgarmas kuchlanish oluvchi simmetrik to‘g’irlagichni o’rganish va 2-rasmdagi sxemani yig’ish o‘lchov natijalari asosida 1-jadvalni tuzish bajariladi.

ABM1, ABM2, IP, C_1=C_2=20 mkF, 30 mkF, 50 mkF, C_{f1}=C_{f2}=50 mkF, D_1,D_2,=K $D_1$03A(D223), R_{f1}=510 Om, R_{yuk}=1kOm (o’zgaruvchan qarshilik).

2-rasmdagi prinsipial sxemaga kerakli elementlar kirgiziladi va 12 V li o‘zgaruvchan manba kirishiga ulanadi.

2-rasm Kuchlanishni ikki barobar oshiruvchi simetrik to‘g’irlagichni prinsipial sxemasi.



C_1 C_2 sig’imlarini o‘zgartirib chiqishdagi kuchlanishni o‘zgarishi 1- jadvalga yoziladi.

1-jadval.

$C_1=C_2$, mkF	20	30	50
U_{kir}, V	24	24.016	24.019
$U_{chiq}=U_n$, V	31	32.267	38.59

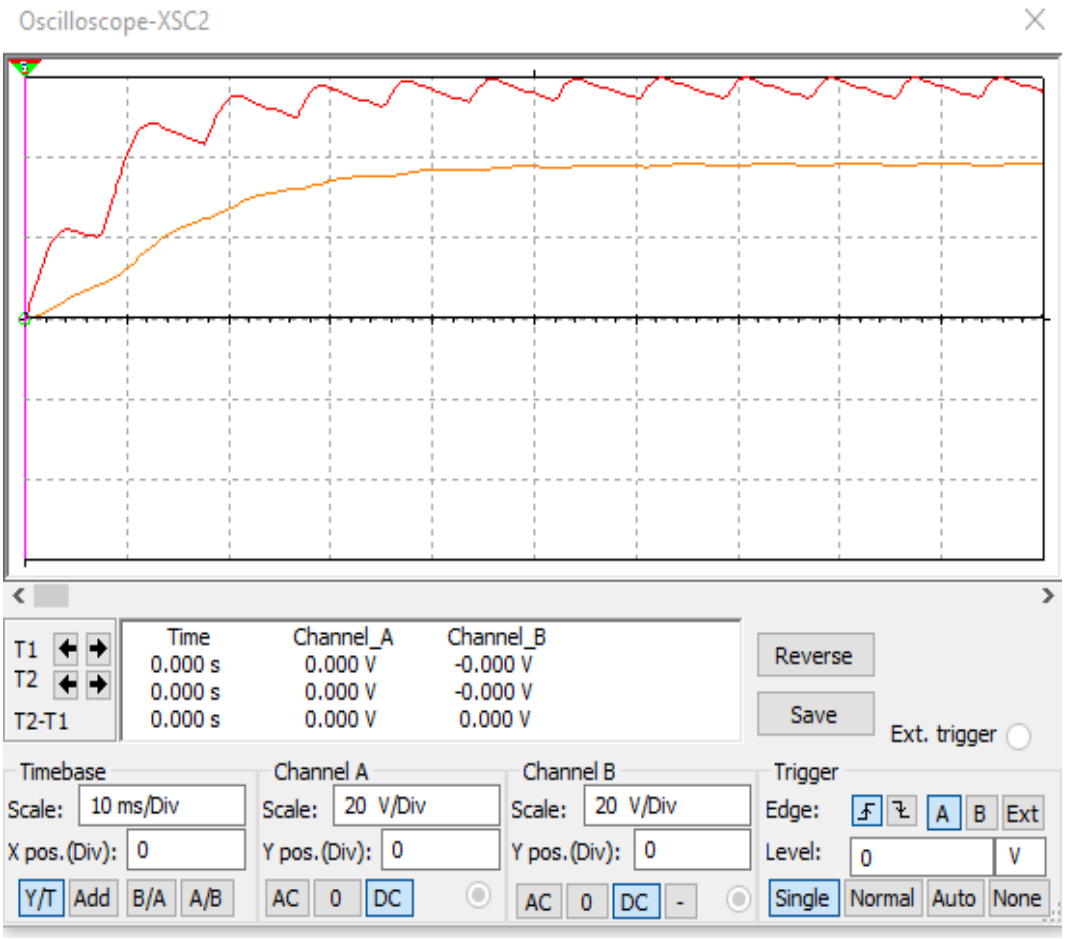
Ikki yarim davrli to‘g’irlagichni filtrsiz va filtr orqali tashqi xarakteristikasi olinadi. Buning uchun yuklamadan o‘tadigan tokni o‘zgartirib chiqishdagi kuchlanishni o‘zgarishi 2-jadvalga yoziladi. Yuklamadagi tokni o‘zgarishi R_{yuk} orqali amalga oshiriladi. Filtr sifatida $C_{f1}=C_{f2}=20$mkF, $R_{f1}=500$ Om ishlatiladi.

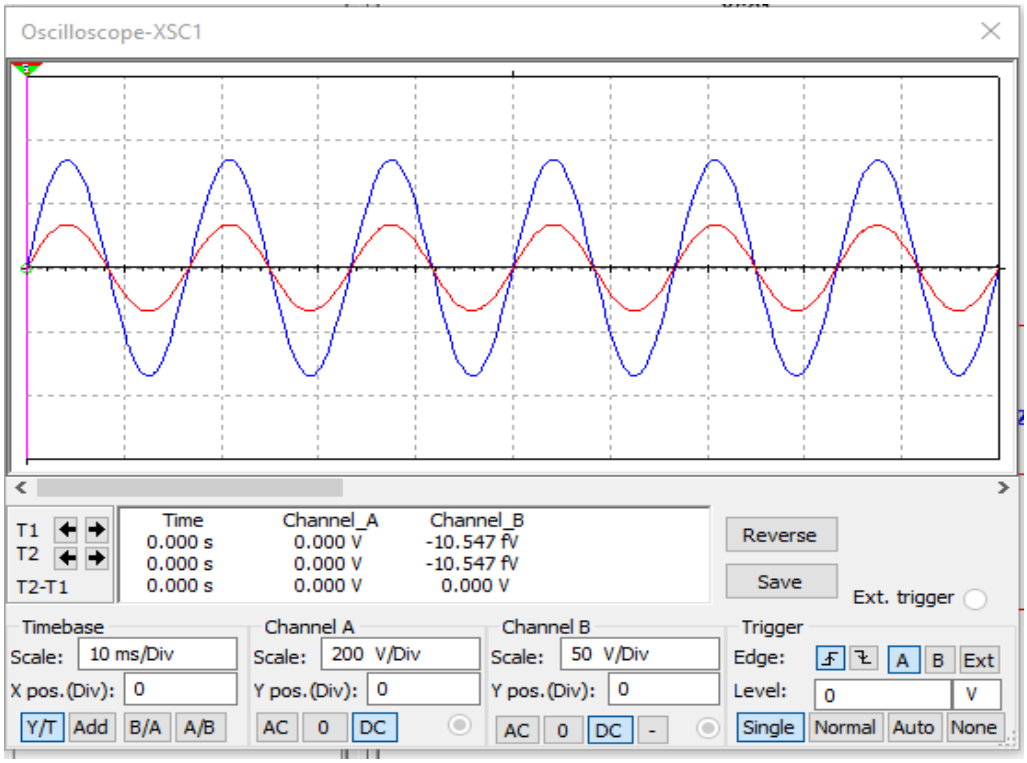
2- jadval.

Parametrlari	Filtrsiz					Filtr bilan				
U_{yuk}, V	13.879	22.796	29.06	33.71	37.3	14.41	23.6	30	34.7	38.2
I_{yuk}, mA	69	57	48	42	37	72	59	50	43	38

Ossillograf orqali yuklamadan maksimal tok oqqanda chiqish kuchlanishi shakli kalkaga ko’chirib olinadi. Buning uchun ossillograf ekranidan to‘g’irlagichni filtrsiz va filtr orqali ulangan sxemasidagi chiqish kuchlanishi shakli to’xtatib ko’chiriladi.

2-jadvaldan foydalanib to‘g’irlagichni filtrsiz va filtr orqali ulangan variantini tashqi xarakteristikasi chiziladi.


Oscilloscope-XSC2
T1
T2
T2-T1
Time
Channel_A
Channel_B
0.000 s
0.000 V
-0.000 V
0.000 s
0.000 V
-0.000 V
0.000 s
0.000 V
0.000 V
Reverse
Save
Ext. trigger
Timebase
Scale: 10 ms/Div
X pos.(Div): 0
Y/T
Add
B/A
A/B
Channel A
Scale: 20 V/Div
Y pos.(Div): 0
AC
0
DC
Channel B
Scale: 20 V/Div
Y pos.(Div): 0
AC
0
DC
-
Trigger
Edge:
A
B
Ext
Level: 0 V
Single
Normal
Auto
None


Oscilloscope-XSC1
T1
T2
T2-T1
Time
Channel_A
Channel_B
0.000 s
0.000 V
-10.547 fV
0.000 s
0.000 V
-10.547 fV
0.000 s
0.000 V
0.000 V
Reverse
Save
Ext. trigger
Timebase
Scale: 10 ms/Div
X pos.(Div): 0
Y/T
Add
B/A
A/B
Channel A
Scale: 200 V/Div
Y pos.(Div): 0
AC
0
DC
Channel B
Scale: 50 V/Div
Y pos.(Div): 0
AC
0
DC
-
Trigger
Edge:
A
B
Ext
Level: 0 V
Single
Normal
Auto
None

Xulosa qilib aytganda, kuchlanishni ikki barobar oshiruvchi simmetrik to‘g‘irlagichlar yuqori kuchlanish, ammo kichik tok talab qiladigan yuklamalarni ta’minlash uchun qo‘llaniladi. Ular o‘zgarmas chiqish kuchlanishini ta’minlashda, ayniqsa kuchlanish 1 kV gacha kerak bo‘lganda foydalidir.

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NEW SOLUTIONS FOR IMPROVING GEODETIC WORK BASED ON AUTOCAD IN CREATING LONGITUDINAL AND TRANSVERSE PROFILES OF HYDROTECHNICAL STRUCTURES IN THE KASHKADARYA REGION USING DRONES AND GIS

Abstract.*This paper presents a scientific and technological approach to improving geodetic work in the design of longitudinal and transverse profiles of hydrotechnical structures. Utilizing AutoCAD software, drone-based data collection, and Geoinformation Systems (GIS), this study provides a structured methodology for precise and efficient terrain modeling in the Kashkadarya region of Uzbekistan. The implementation of this integrated system demonstrates significant improvements in accuracy, efficiency, and decision-making capabilities. Results of the innovative method are discussed and validated through field experiments.*

Key words: *Geoinformation Systems (GIS), AutoCAD, UAV, visualization*

Introduction. Geodetic work is foundational in the design and maintenance of hydrotechnical structures such as canals, dams, and water pipelines. Traditional surveying techniques often face limitations in speed, accuracy, and accessibility. In recent years, integrating advanced technologies like drones, AutoCAD, and GIS has opened new avenues for improving these processes.
This study investigates the implementation of a novel geodetic workflow in the Kashkadarya region, where terrain complexity and project requirements demand high precision. The aim is to develop and apply new solutions based on AutoCAD for longitudinal and transverse profile drawing of hydrotechnical structures, supported by UAV data and geospatial analysis tools.

Methodology.

Use of Drone Technology .A DJI Phantom 4 RTK drone was employed to collect high-resolution topographic imagery over the target area. The drone was programmed to follow a grid flight path with overlapping images (80% frontal, 70% side) to ensure complete terrain coverage. RTK technology ensured centimeter-level accuracy.

Image Processing and Model Generation. Captured images were processed using photogrammetry software (Pix4D Mapper), which generated:
- A high-resolution orthomosaic
- A Digital Elevation Model (DEM)
- A 3D point cloud
- Contour maps

The processed data was exported in formats compatible with AutoCAD Civil 3D for profile design.

Profile Drawing in AutoCAD. AutoCAD Civil 3D was used for generating the geodetic profiles [1,5]. The following stages were conducted:
- Stage 1: Base Alignment Setup
- Stage 2: Surface and Sample Line Creation
- Stage 3: Profile Generation
- Stage 4: Annotation and Detailing

GIS Integration. The generated profiles and geospatial data were transferred to ArcGIS. Here, further spatial analysis was performed, including:
- Hydrological modeling
- Environmental impact overlays
- Infrastructure network planning

GIS allowed multi-layered visualization and decision support.

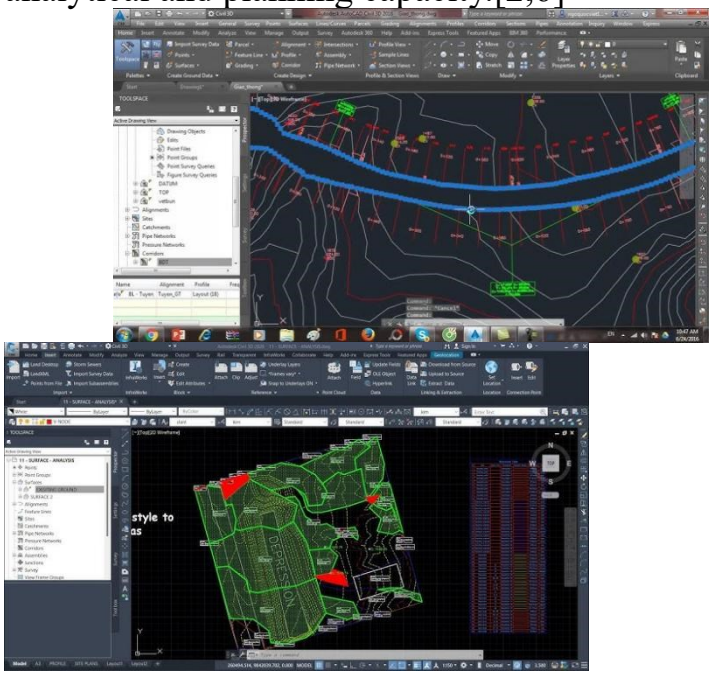
Case Study: Kashkadarya Region. A pilot project was conducted on a proposed irrigation canal in the Kashkadarya region. Data collection and processing followed the methodology described above. The terrain consisted of rolling hills and flat valleys, which required a precise understanding of elevation changes for proper water flow and channel design.

Outcomes:

Table 1

Indicator	Traditional Surveying	Drone-Based + AutoCAD + GIS
Profile Drawing Time	10–12 days	4–5 days
Elevation Accuracy	±15 cm	±3–5 cm
Field Crew Requirement	5–6 people	2–3 people
Data Integration with GIS	Manual	Seamless
Cost Reduction	–	~35%

The combination of UAV photogrammetry, AutoCAD profile generation, and GIS analysis provided a highly efficient and accurate system for geodetic work in hydrotechnical engineering. The drone significantly reduced field time and risks. AutoCAD facilitated rapid and automated profile generation. GIS added a broader analytical and planning capacity.[2,6]



This innovation is particularly important for regions like Kashkadarya, where terrain variability and water infrastructure modernization require fast and reliable survey solutions.[3,7]

Scientific and Technical Contributions

- Innovation in Profile Drawing: Fully automated generation of profiles using drone data.
- Geospatial Integration: Enhanced decision-making via GIS-based visualization and modeling.
- Precision: Improved accuracy compared to traditional tools.
- Efficiency: Reduction in time and resources, leading to more cost-effective project planning.[4,8,9]

Conclusion. The proposed method marks a significant advancement in geodetic work for hydrotechnical structures. By integrating drones, AutoCAD, and

GIS, this approach increases accuracy, reduces costs, and speeds up the design process. It is especially suitable for large-scale or remote infrastructure projects in Uzbekistan and beyond.

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REANIMATSIYA AMALIYOTIDA QO'LLANILADIGON PSIXOTROP DORILARINING INSON ORGANIZIMIGA FOYDALI VA SALBIY TA'SIRLARI

Annotatsiya. *Psixotrop dorilar zamonaviy reanimatsiya amaliyotida asosiy farmakologik vositalardan biri hisoblanadi. Og'ir klinik holatlarda, xususan, hushsiz holatlar, agitatsiya, status epileptikus, sun'iy ventilyatsiya, travmatik shok va sepsis singari sindromlarda psixotrop preparatlarning o'rni beqiyosdir. Ular markaziy asab tizimining faoliyatini modulyatsiya qilish orqali bemorning hayotiy muhim funksiyalarini barqarorlashtirish, og'riqni yengillashtirish, kayfiyat va ongni me'yorlashtirishga xizmat qiladi. Reanimatsion muhitda eng ko'p qo'llaniladigan psixotrop vositalar – sedativlar, neyroleptiklar, anksiolitiklar, antiepileptiklar va yangi avlod selektiv preparatlardir. Ular qisqa muddatli yoki uzoq davom etuvchi intensiv terapiyada bemor bilan ishlashni yengillashtiradi, ayrim hollarda esa jon saqlab qolishga xizmat qiladi. Shunga qaramasdan, ushbu dorilarning inson organizmiga salbiy ta'siri ham mavjud bo'lib, noto'g'ri dozalanishi yoki davomiy qo'llanilishi nafas olish markazi susayishi, yurak ritmining buzilishi, aqliy faoliyatning pasayishi, koma holatlari, metabolik muvozanatsizlik va hatto o'limga olib kelishi mumkin. Bundan tashqari, reanimatsiyada uzoq vaqt yotgan bemorlarda. Postintensiv psixologik sindromlar rivojlanish xavfi yuqori bo'ladi. Ushbu maqolada reanimatsion amaliyotda psixotrop vositalarning qo'llanish yo'nalishlari, klinik afzalliklari, salbiy oqibatlari, xavfsiz dozalar va zamonaviy yondashuvlar chuqur tahlil etilgan. Shuningdek, individual yondashuv, farmakodinamik va farmakokinetik xususiyatlarni inobatga olish, klinik monitoring va xalqaro tavsiyalarga asoslangan holda ishlash muhimligi asoslab beriladi. Mazkur tahlil intensiv terapiyada faoliyat yuritayotgan shifokorlar, anesteziolog-reanimatologlar, hamshiralik mutaxassislari va farmakologlar uchun amaliy va nazariy qo'llanma sifatida xizmat qiladi.*

Kalit so'zi. *Psixotrop vositalar, reanimatsiya amaliyoti, sedatsiya jarayoni, ongni bostirish mexanizmi, nojo'ya ta'sirlar, hayotiy funksiyalar monitoring, multidisiplinar yondashuv.*

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BENEFICIAL AND ADVERSE EFFECTS OF PSYCHOTROPIC DRUGS ON THE HUMAN BODY IN RESUSCITATION PRACTICE.

Annotation. *Psychotropic drugs are among the key pharmacological agents in modern resuscitation practice. In severe clinical conditions — particularly in cases such as unconscious states, agitation, status epilepticus, artificial ventilation, traumatic shock, and sepsis — the role of psychotropic medications is invaluable. By modulating central nervous system activity, these drugs help stabilize vital functions, relieve pain, and regulate mood and consciousness. The most commonly used psychotropic agents in the intensive care setting include sedatives, neuroleptics, anxiolytics, antiepileptics, and newer-generation selective drugs. They facilitate short- or long-term intensive therapy, improve patient management, and, in some cases, are crucial for survival. However, these medications can also have adverse effects on the human body. Incorrect dosing or prolonged use may lead to respiratory depression, cardiac arrhythmias, cognitive impairment, coma, metabolic imbalances, or even death. Additionally, patients undergoing extended stays in intensive care are at increased risk of developing post-intensive care psychological syndromes. Theis article provides an in-depth analysis of the application of psychotropic agents in critical care, highlighting their clinical benefits, side effects, safe dosages, and modern approaches. The importance of individualized treatment, consideration of pharmacodynamic and pharmacokinetic properties, clinical monitoring, and adherence to international guidelines is emphasized. This analysis serves as both a practical and theoretical guide for intensive care physicians, anesthesiologists-resuscitators, nursing specialists, and pharmacologists.*

Keywords. *Psychotropic agents, kesuscitation practice, sedation process, mechanism of consciousness suppression, adverse effects, vital signs monitoring, multidisciplinary approach.*

Kirish. Zamonaviy reanimatsiya va intensiv terapiya amaliyotida psixotrop vositalar og'ir holatdagi bemorlarning asab-ruhiy va fiziologik funksiyalarini barqarorlashtirishda muhim o'rin egallaydi. *Psixotrop dorilar markaziy asab tizimiga ta’sir etuvchi moddalar bo'lib, ularning ta’siri asosan neyromediatorlar almashinuvi orqali amalga oshadi [1].* Ular, asosan, markaziy asab tizimi faoliyatiga ta’sir qilib, ong buzilishi, deliryum, bezovtalik, xavotir, agitatsiya kabi

holatlarni yengillashtirish yoki bartaraf etishda qo‘llaniladi. Bunday holatlar reanimatsiya sharoitida tez-tez uchraydi va bemorning hayotiy ko'rsatkichlarini nazorat qilishda muammolar tug'diradi. Psixotrop vositalar keng doiradagi dorilar guruhini o'z ichiga oladi. Ular ruhiy holat, idrok, xulq-atvor va kayfiyatga ta’sir ko'rsatadi. Reanimatsiya amaliyotida esa, ularning sedativ, anksiolitik, antipsixotik ta’sirga ega turlari keng qo'llaniladi. Ushbu dorilar bemorni tinchlantiradi, zo'riqish va ruhiy iztirobni kamaytiradi, invaziv muolajalarni o'tkazish imkonini yaratadi, sun’iy nafas oldirish va boshqa hayotiy yordam choralarini olib borishni yengillashtiradi. Biroq psixotrop vositalardan foydalanish ehtiyotkorlikni talab qiladi. Ularning noto'g'ri dozalanishi yoki nazoratsiz qo'llanilishi nafas olish markazi faoliyatining susayishi, arterial bosimning tushib ketishi, ongning chuqur bostirilishi, kognitiv buzilishlar kabi nojo'ya ta’sirlarga olib kelishi mumkin. Shuningdek, uzoq muddatli sedatsiya va hushsiz holat bemorda reanimatsiyadan keyingi nevropsixologik muammolarni keltirib chiqarishi mumkin. Reanimatsiya amaliyoti – bu hayotiy xavf ostida bo'lgan bemorlarning hayotiy ko'rsatkichlarini barqarorlashtirish va tiklashga qaratilgan murakkab tibbiy jarayonlar majmuasidir. *Reanimatsiyada har bir dori vositasining dozasi, ta’sir vaqti va nojo'ya oqibatlari oldindan hisobga olinishi kerak [2].* Ushbu jarayon nafas olish, yurak faoliyati, qon aylanishi kabi asosiy hayotiy funksiyalarni qo'llab-quvvatlashni o'z ichiga oladi va tezkor va professional tibbiy yordamni talab qiladi. Reanimatsiya bo'limida ishlashda inson omili, ya’ni tibbiyot xodimlarining tajribasi, bilimlari, diqqat-e’tibori va tezkor qaror qabul qilish qobiliyati eng muhim omillardan biri hisoblanadi. Chunki reanimatsiya sharoitida har bir soniya hisoblanadi, va bemorning hayotiy ko'rsatkichlaridagi eng kichik o'zgarishlar ham shoshilinch choralar ko'rishni talab qiladi. Shifokorlar va hamshiralar nafaqat bemorning fiziologik holatini monitoring qiladilar, balki uning psixologik holatini ham nazorat qilishlari kerak. Ayniqsa, og'ir og'riq, bezovtalik yoki ruhiy stress ko'rsatkichlarini kamaytirish uchun psixotrop vositalardan foydalaniladi. Bu jarayonda inson omili psixotrop dorilarning to'g'ri va ehtiyotkorlik bilan tanlanishi, ularning nojo'ya ta’sirlarini vaqtida aniqlash va bartaraf etishda o'z ifodasini topadi. Reanimatsiya amaliyotida ishlovchi mutaxassislar jamoasi o'zaro mukammal hamkorlikda ishlashi, bemorning holatini to'liq tushunishi va har bir qarorni tez va aniq qabul qilishi bemorning muvaffaqiyatli tiklanishida hal qiluvchi ahamiyatga ega. Reanimatsiya amaliyoti nafaqat zamonaviy tibbiyot uskunalari va dori vositalarining yuqori darajada bo'lishini, balki inson omilining malakali va puxta bo'lishini talab qiladi. Bemorning ruhiy va jismoniy holatini tinchlantirish, bezovtalikni kamaytirish, ongni pasaytirish orqali invaziv muolajalarni xavfsiz va og'riqsiz bajarishga imkon beruvchi muhim tibbiy bosqichdir sedatsiya jarayoni. *Sedatsiya jarayoni — bemorning ruhiy va jismoniy holatini tinchlantirish maqsadida amalga oshiriladigan muhim bosqichdir [3].* Reanimatsiya amaliyotida ushbu jarayon alohida e’tibor talab qiladi, chunki sedatsiya nafaqat bemorning qulayligini ta’minlaydi, balki hayotiy funksiyalarni barqaror saqlab turish va apparat yordamida nafas oldirish imkonini yaratadi. Reanimatsion sedatsiya faqat dori vositalarini berish emas, balki chuqur bilim, tajriba va hushyorlikni talab

qiluvchi murakkab klinik jarayondir. Bu yerda inson omili juda muhim – ya’ni, bemorga qanday dorini, qanday dozada, qanday holat va qanday muddatga qo'llash kerakligini aniqlashda shifokorning tajribasi, kasbiy bilimlari va muolajalarga bo'lgan ehtiyotkorligi hal qiluvchi ahamiyatga ega bo'ladi. Sedatsiya odatda mexanik ventilyatsiya (sun'iy nafas oldirish) ostidagi bemorlarda, traxeostomiya, kateterizatsiya, og'ir og'riqli yoki travmatik muolajalar vaqtida, shuningdek, og'ir psixomotor bezovtalik holatlarida qo'llaniladi. Ushbu jarayonda sedatsiya chuqurligi individual ravishda tanlanadi: yengil tinchlantirishdan to to'liq hushsizlik holatigacha bo'lgan spektrda. Har bir holatda bemorning holati, qon aylanishi, nafas olish, yurak urishi, reflekslar va ong darajasi qat’iy nazorat ostida bo'lishi kerak. Sedatsiyaning muvaffaqiyati ko'p jihatdan multidisiplinar yondashuv va sog'liqni saqlash jamoasining uzluksiz hamkorligiga bog'liq. Bu jarayonda nafaqat reanimatolog, balki hamshira, anesteziolog, klinik farmatsevt, hamda texnik mutaxassislar ham o‘z vaqtida va mos tarzda harakat qilishlari zarur. Bundan tashqari, sedatsiya jarayonida psixotrop vositalarning noto'g'ri dozalari, dori-darmonlarga individual sezuvchanlik, bemorning jigar va buyrak faoliyatidagi o'zgarishlar yoki avvalgi ruhiy holati nojo'ya ta’sirlarning kuchayishiga olib kelishi mumkin. Shuning uchun bemorning doimiy monitoringi, klinik va laborator kuzatuvlar orqali muvozanatli boshqaruvga erishish zarur. Xulosa qilib aytganda, sedatsiya jarayoni nafaqat tibbiy texnologiya va farmakologiyaning yutug'i, balki yuqori darajadagi insoniy mas’uliyat, tajriba va kuzatuvchanlikni talab etadigan murakkab va javobgar bosqichdir. Ongni bostirish mexanizmi — bu markaziy nerv tizimining (MNT) faoliyatini vaqtincha susaytirish orqali hushyorlik, sezgi, xotira va harakat funksiyalarining pasayishiga olib keluvchi murakkab nevrofiziologik jarayondir. *Ongni bostirishda dorilar gipotalamus va talamusdagi neyronlar faolligini pasaytirish orqali o'z ta’sirini ko'rsatadi [4].* Ushbu mexanizm reanimatsion amaliyotda, ayniqsa og'ir holatdagi bemorlar bilan ishlashda, psixotrop vositalar yordamida amalga oshiriladi. Reanimatsiya sharoitida bemor ko'pincha sun’iy nafas olish apparatiga ulangan bo'ladi yoki og'ir og'riqli protsedurali muolajalarga duchor bo'ladi. Bunday vaziyatlarda ongni saqlab qolgan bemor ruhiy va jismoniy jihatdan og'ir stress holatiga tushib qoladi. Shu sababli ongni vaqtincha bostirish orqali bemorga tinchlik, og'riqsizlik va fiziologik barqarorlikni ta’minlash mumkin bo'ladi. Psixotrop dorilar ushbu holatda MNTdagi asosiy neyromediatorlar — GABA (gamma-amino butirik kislota), glutamat, dopamin, serotonin kabi moddalar almashinuviga ta’sir qilib, neyronlararo impuls uzatishni susaytiradi. Natijada miyaning hushyorlikni boshqaruvchi qismlari — ayniqsa, talamus, gipotalamus va serebral korteksda faollik kamayadi. Bu holat sedatsiyadan chuqurroq darajaga, ya’ni tibbiy koma holatigacha borishi mumkin. Ongni bostirish faqatgina farmakologik jarayon emas, bu yondashuvda inson omili — ya’ni shifokorning har bir bemor holatiga mos va ehtiyotkor yondashuvi katta ahamiyatga ega. Har bir bemorning ong darajasi maxsus klinik shkalalar orqali (masalan, Glazgo koma shkalasi, RASS — Richmond Agitation-Sedation Scale) baholanadi. Bunda sog'liqni saqlash xodimlari — reanimatolog, anesteziolog va hamshiralar bemorning ongini doimiy kuzatib borishadi va sedatsiyaning kerakli

darajasini saqlash uchun dorilarning dozasini moslab boradilar. Shuni unutmaslik kerakki, ongni bostirish doim ham xavfsiz emas: bu jarayon nafas markazi faoliyatini susaytirishi, arterial bosimning tushishi, gipoksiya, gemodinamik buzilishlar va boshqa asoratlarga olib kelishi mumkin. Shuning uchun ushbu mexanizm faqat zarurat tug'ilgandagina, qat'iy monitoring ostida, tajribali mutaxassislar tomonidan amalga oshirilishi lozim. Xulosa qilib aytganda, ongni bostirish mexanizmi — reanimatsiyada qo'llaniladigan zarur, ammo yuqori mas'uliyatli bosqich bo'lib, u faqat dori vositalariga emas, balki insoniy hushyorlik, ehtiyotkorlik va doimiy klinik kuzatuvga tayangan holda amalga oshirilishi kerak. Nojo'ya ta'sirlar — bu dori vositasining asosiy maqsadga qaratilmagan, organizmda yuzaga keladigan salbiy yoki noxush reaksiyalaridir. Reanimatsiya amaliyotida psixotrop vositalar qo'llanilganda nojo'ya ta'sirlar xavfi ayniqsa yuqori bo'ladi, chunki bemorlarning holati og'ir, funksional zaxiralari cheklangan, hamda bir vaqtning o'zida bir nechta dori vositalari qo'llaniladi. *Psixotrop dori vositalarining ko'plab nojo'ya ta'sirlari yurak, jigar, buyrak va nafas tizimida kuzatiladi [5].* Psixotrop dorilar markaziy nerv tizimi (MNT), yurak-qon tomir, nafas olish va endokrin tizimlarga ta'sir etuvchi kuchli ta'sirga ega bo'lgan moddalar hisoblanadi. Ularning nojo'ya ta'sirlari keng doirada namoyon bo'lishi mumkin: Nafas olish markazining susayishi**.** Sedativ va narkotik vositalar (masalan, benzodiazepinlar, barbituratlar) nafas olish markazi faoliyatini pasaytiradi, bu ayniqsa mexanik ventilyatsiyaga ulanmagan bemorlar uchun hayotiy xavf tugdiradi. Reanimatsiya sharoitida bu holat doimiy monitoring va nafas olishni qo'llab-quvvatlash vositalarini talab qiladi. Gemodinamik buzilishlar**.** Psixotrop dorilar arterial bosimni tushirib yuborishi, bradikardiya, yurak ritmining buzilishi (aritmiyalar) kabi yurak-qon tomir tizimiga salbiy ta'sir ko'rsatishi mumkin. Bunday holatlarda doimiy EKG-monitoring va qon bosimini kuzatib turish muhim. Deliriy va ongni chalkashligi. Uzoq muddatli sedatsiya yoki noto'g'ri tanlangan dori vositalari bemorlarda ongning buzilishi, gallyutsinatsiyalar, tashvish va ruhiy tushkunlik kabi psixiatrik nojo'ya ta'sirlarni chaqirishi mumkin. Bu ayniqsa keksa bemorlarda yoki ilgari psixiatrik kasalliklar bilan og'riganlarda ko'p kuzatiladi. Gipotermiya va termoregulyatsiya buzilishi. Ba'zi psixotrop dorilar termoregulyatsiyani izdan chiqarib, tana haroratining haddan tashqari pasayishiga (gipotermiya) yoki oshishiga (gipertermiya) olib kelishi mumkin. Bu holatlar ham intensiv kuzatuvni talab etadi. Allergik reaksiyalar va doriye sezuvchanlik. Noyob hollarda bo'lsa-da, psixotrop dorilar teri toshmalari, bronxospazm, anafilaktik shok kabi og'ir allergik reaksiyalarni keltirib chiqarishi mumkin. Shuning uchun har bir yangi dori ehtiyotkorlik bilan, dozalashda esa ehtimoliy xavf omillarini inobatga olgan holda qo'llanadi. Doimiy qo'llanilganda psixologik yoki jismoniy qaramlik. Ayrim dorilar — ayniqsa opioidlar va ba'zi trankvilizatorlar uzoq muddat foydalanilganda qaramlikni yuzaga keltirishi mumkin. Bu holat bemorning reabilitatsiya davrida qo'shimcha psixologik yordam va kuzatuvni talab etadi. Inson omili bilan bog'liqlik**.** Nojo'ya ta'sirlarning oldini olish va ularni erta aniqlashda inson omili – ayniqsa reanimatsiyada ishlovchi shifokor va hamshiralar tajribasi, kuzatuvchanligi, bemorga individual yondashuvi hal qiluvchi ahamiyat kasb etadi. Dori

vositalarining dozasini to'g'ri hisoblash, qo'llash oralig'ini belgilash, organizmning javob reaksiyalarini doimiy tahlil qilish orqali bu xavflar minimumga tushiriladi. Xulosa qilib aytganda, nojo'ya ta’sirlar — bu har bir psixotrop vosita bilan bog'liq bo'lgan muhim xavflardan biridir. Reanimatsion muhitda bu ta’sirlar nafaqat bemor hayotiga xavf tug'diradi, balki sog'liqni saqlash jamoasining mas’uliyat darajasini ham belgilaydi. Hayotiy funksiyalar monitoringi — bu inson organizmining muhim fiziologik ko‘rsatkichlarini uzluksiz yoki davriy tarzda kuzatish va baholash jarayonidir. *Reanimatsiyada bemorning yurak urishi, nafas soni va qon bosimini uzluksiz monitoring qilish hayotiy ahamiyatga ega* [6]. Reanimatsiya sharoitida bu monitoring psixotrop vositalar bilan ishlaganda ayniqsa muhim ahamiyat kasb etadi. Chunki bu vositalar markaziy nerv tizimi, nafas olish, yurak-qon tomir, jigar, buyrak kabi tizimlarga kuchli ta’sir o'tkazishi mumkin. Psixotrop dorilarni qo'llagan holatlarda bemorning hayotiy ko'rsatkichlaridagi har qanday keskin o'zgarish xavfli bo'lishi mumkin, shuning uchun monitoring yordamida dorilarning ta’siri va nojo'ya oqibatlarini erta aniqlash, ularni bartaraf etish imkoniyati yaratiladi. Monitoring qilinadigan asosiy funksiyalar. Nafas olish tezligi va sifati**.** Psixotrop dorilar, ayniqsa sedativlar, nafas markazini susaytirib qo'yishi mumkin. Shuning uchun reanimatsiyada nafas olish soni, chuqurligi, kislorod bilan to'yinganlik (SpO_2) doimiy nazorat qilinadi. Zarurat tug'ilganda sun’iy ventilyatsiyaga o'tkaziladi. Yurak urish tezligi va EKG monitoring**.** Psixotrop vositalar yurak ritmiga ta’sir etib, taxikardiya yoki bradikardiya, aritmiyalar chaqirishi mumkin. Bu holatlarning oldini olish uchun yurak faoliyati doimiy ravishda yurak monitori yordamida kuzatib boriladi. Arterial qon bosimi (AQB) Sedatsiya va ongni bostirish vositalari arterial bosimni tushirishi mumkin. Bu esa perfuziya buzilishlariga olib keladi. Shuning uchun bemorning AQBsi avtomatik yoki invaziv usullar bilan muntazam o'lchanadi. Tana harorati**,** ayrim psixotrop vositalar tana haroratini oshirishi (gipertermiya) yoki pasaytirishi (gipotermiya) mumkin. Shuning uchun doimiy termometriya amalga oshiriladi. Diurez va buyrak funksiyasi**,** buyraklar faoliyati sedatsiya fonida sekinlashishi mumkin. Diurez (siydik miqdori) monitoringi buyraklar salomatligini baholashda yordam beradi. Neyrologik status**,** bemorning ong holati, reflekslari va harakat reaksiyalari baholanadi. Sedatsiya darajasi maxsus shkalalar yordamida (masalan, RASS yoki GCS) aniqlanadi. Bu monitoring dorining kerakli darajada ishlayotganini yoki ongni ortiqcha bostirganini ko'rsatadi. Monitoringning ahamiyati. Hayotiy funksiyalar monitoringi psixotrop dorilar bilan ishlaganda quyidagi jihatlarda hal qiluvchi rol o'ynaydi. Dorining samaradorligini baholash. Nojo'ya ta’sirlarni erta aniqlash. Dori dozasi va davolash rejasini individual tarzda moslashtirish. Favqulodda holatlarning oldini olish va tezkor javob berish. Monitoring uskunalari zamonaviy texnologiyalarga asoslangan bo'lsa ham, ularni ishlatish, to'g'ri tahlil qilish va natijalarga asosan qaror qabul qilish inson — ya’ni reanimatolog, hamshira va boshqa tibbiyot xodimlari bilim va tajribasiga bog'liq. Monitoring samaradorligi doimiy e’tibor, hushyorlik va shoshilinch holatlarga tayyor turishni talab etadi. Multidisiplinar yondashuv — bu bir necha mutaxassislik vakillarining bemor holatiga birgalikda, uzviy hamkorlikda yondashishi, davolash va parvarish strategiyasini jamoaviy tarzda belgilashi

demakdir. *Reanimatsiya bo'limida samarali davolash uchun reanimatolog, psixiatr, kardiolog va farmakolog hamkorligi zarur* [7]. Reanimatsiya amaliyotida, ayniqsa psixotrop dorilarni qo'llashda bu yondashuv juda muhim, chunki bunday holatlar ko'p qirrali tibbiy, psixologik va farmakologik bilimlarni talab etadi. Psixotrop vositalar organizmga ko'p tomonlama ta’sir qiladi: ular asab tizimini tinchlantiradi, og'riqni bostiradi, lekin shu bilan birga yurak-qon tomir, nafas, jigar va buyrak funksiyalariga ham salbiy ta’sir ko'rsatishi mumkin. Shu bois, faqat reanimatolog emas, balki quyidagi soha vakillari ham davolash jarayoniga jalb qilinadi.

Multidisiplinar jamoa tarkibi va ularning roli. Reanimatolog Dastlabki tashxis, umumiy dori tanlovi va hayotiy funksiyalarni barqarorlashtirish bo‘yicha yetakchi qarorlarni qabul qiladi. Sedatsiya darajasini baholaydi, dozani belgilaydi. Psixiatr / Nevrolog psixotrop vosita tanlashda bemorning ruhiy holatini, avvalgi psixiatrik anamnezini baholab beradi. Dori moddalarning asab tizimiga ta’sirini prognoz qiladi. Kardiolog agar bemorda yurak-qon tomir kasalliklari bo'lsa, dori tanlovi yurakka salbiy ta’sir qilmaydigan usulda muvofiqlashtiriladi. Farmakologik dori-darmonlar o'zaro ta’siri, dori metabolizmi va chiqarilishi bo'yicha maslahat beradi. Ayniqsa ko'p dori bir vaqtda qo'llanganda xavfli o'zaro ta’sirlarni oldini olishga yordam beradi.

Hamshira/intensiv parvarish bo'yicha mutaxassis. Har daqiqalik kuzatuv, dori yuborish va bemorning fiziologik reaksiyalarini qayd etishda hal qiluvchi ahamiyatga ega. Monitoring moslamalari natijalarini kuzatib boradi. Fizioterapevt va psixolog (uzoq muddatli reabilitatsiyada). Psixotrop vositalardan chiqqach, bemorning ong holatini tiklash, harakat funksiyalarini qayta tiklash va ruhiy barqarorlikni ta’minlashda ishtirok etadi. Afzalliklari.Xavfsiz va individual yondashuv: Har bir mutaxassis o'z sohasi bo'yicha xavflarni baholab, qarorlar qabul qilinadi. Nojo'ya ta’sirlarni kamaytirish: Dorilarning sistemali ta’siri va xavfli kombinatsiyalarini oldini olish mumkin. Tez va samarali qaror qabul qilish**:** Jamoaviy baholash tezda to'g'ri yo'l tanlash imkonini beradi. Bemorga kompleks yordam: Faqat fiziologik emas, balki psixologik va ijtimoiy omillar ham hisobga olinadi. Reanimatsiya sharoitida psixotrop dorilarni qo'llash – bu faqat dori yuborish emas, balki butun organizm faoliyatini muvozanatda ushlab turish demakdir. Bunday hollarda multidisiplinar yondashuv har bir bemorning hayotini saqlab qolish, sifatli reabilitatsiyaga erishish va ijobiy natija olishning eng ishonchli yo'lidir.

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PO‘LATDAN TAYYORLANGAN QUYMA MAHSULOTLARDA KUYISHLARNING HOSIL BO‘LISHI

Annotatsiya: *Ushbu maqolada hozirgi kundagi sanoat korxonalarida quyma mahsulotlar olishda kelib chiqadigan nuqsonlar juda ko‘p bo‘lib, shulardan biri po‘latdan tayyorlangan quyma mahsulotlarning yuzalarida hosil bo‘ladigan kuyindilardir. Maqolada quyma mahsulot yuzasidagi kuyindilarning kelib chiqish sabablari, termik, mexanik, kimyoviy turlari va ularni kamaytirish choralari haqida yoritilgan*

Tayanch so‘zlar: *quyma, kuyish, termik kuyish, mexanik kuyish, kimyoviy kuyish.*

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FORMATION OF BURNT DEPOSITS IN CAST STEEL PRODUCTS

Abstract: *This article examines numerous defects that arise during the production of cast products in modern industrial enterprises, one of which is the formation of carbon deposits on the surface of cast steel products. The article discusses the causes of carbon deposits on the surface of cast products, thermal, mechanical, chemical types, as well as measures to reduce them.*

Key words: *casting, burning, thermal burning, mechanical burning, chemical burning.*

Kuyish - qoliplash materialining metal va uning oksidlari bilan fizik-kimyoviy o‘zaro ta’siri natijasida hosil bo‘lgan, quyma yuzasida olib tashlash qiyin bo‘lgan maxsus qatlam ko‘rinishidagi quyma nuqsonlarini nazarda tutadi.

Kuyish-bu quyishga mahkam yopishgan metall bo‘lmagan qatlam bo‘lib, ko‘pincha silikat eritmasi yoki metall bilan sementlangan qum donalaridan iborat.

Kuygan material quymalarning xossalari va tashqi ko‘rinishini buzadi, shuning uchun kuygan materialning shakllanishi natijasida yuzaga keladigan g‘adir budurlikning kuchaygan maydonlarining mavjudligi va o‘lchamlari quyma uchun texnik shartlar bilan cheklangan. Kuyish miqdori sifat va miqdoriy jihatdan baholanadi.

Quyma yuzasini shakllanishi bu murakkab jarayon bo‘lib, asosida metal oksidlari o‘zaro fizik-kimyoviy ta’siri, temperature rejimi, quymani o‘lchovlari, gazli rejimi, termik kuchlanishlar. Ushbu omillar ta’sirida turli notekisliklar bilan quyma yuzasi shakllanadi.[4]

Kuyindi toifalari tozalash paytida kuyindini olib tashlashning qiyinchilik darajasi va uni bartaraf etish usullari bilan tavsiflanadi.

F. D. Obolensev kuyindini yo‘qotish uchun zarur bo‘lgan usullar va ajralib chiqadigan kuyundi zarralarining turlari bo‘yicha kuyindining tasnifini keltiradi.

Kuyish darajasini miqdoriy baholash uchun kuygan qatlamni ikki xil mexanik ta’sir: ishqalanish va zarba bilan olib tashlash uchun ketadigan mehnat sarfining nisbiy qiymatlari asos qilib olingan. Tozalash uchun sarflanadigan mehnatni miqdoriy baholash uchun kuygan namunalar ikkita qurilmada sinovdan o‘tkaziladi. Ularning birinchisi VPTIlit-prom (Leningrad sh.) tomonidan ishlab chiqilgan bo‘lib, kuygan qatlamni abraziv doira bilan yedirib tashlash vaqtini (Ts) aniqlaydi. Chelyabinsk politexnika institutining quyish jarayonlari texnologiyasi laboratoriyasida yaratilgan ikkinchi qurilma esa iskana shaklidagi urgichning zarbiy ta’siri bilan kuyindi qobig‘ini buzishning solishtirma ishini (Lud) o‘lchaydi.

Quymalarni ishlab chiqarish usullari bilan tozalash vaqtini Ts va Lud qiymatlari bilan taqqoslash bo‘yicha o‘tkazilgan tajribalar natijasida korrelyatsion nisbatlar olindi. Bu nisbatlar ishlab chiqarish sharoitida o‘rganilayotgan kuyindini olib tashlash uchun zarur bo‘lgan mehnat sarfining nisbiy qiymatini hisoblash imkonini beradi.

Kuyishning uch turi farqlanadi: termik, mexanik va kimyoviy. Qabul qilingan bo‘linish shartli hisoblanadi; u hodisani tavsiflashni osonlashtiradi va kuyishning aniq holatlarini o‘rganishda nuqsonni bartaraf etish choralarini ko‘rish uchun qaysi turi ustunlik qilishini baholash imkonini beradi. Aslida esa kuyishning shartli ravishda ajratilgan turlari ko‘pincha birgalikda yuzaga keladi, chunki ularni keltirib chiqaradigan jarayonlar o‘zaro bog‘liqdir.

Termik kuyish qolip materialining quyilgan metall harorati ta’sirida erishi natijasida yuzaga keladi. U har safar yetarli darajada o‘tga chidamli bo‘lmagan qum va loylardan qolipbop va o‘zakli aralashmalar tayyorlashda foydalanilganda paydo bo‘ladi. Bunday kuyish ko‘pincha qalin "po‘stin" shaklida quymalar yuzasidan oson ko‘chadi, biroq quyma notekis kulrang yuzaga ega bo‘lib, unda erimagan kvarsning nuqtasimon qo‘shimchalari mavjud bo‘ladi.

1-rasm. *Po‘lat quyma mahsulotlarda termik kuyishning hosil bo‘lishi.*

Qolip materialining erishi gaz ajralishi va yuza gaz bo‘shliqlarining hosil bo‘lishi bilan birga kechadi. Termik kuyishning oldini olish uchun turli donadorlikdagi yuqori sifatli kvars qumlari yoki yuqori olovbardoshlikka ega materiallar: sirkon, disten-sillimanit, korund, xromomagnezit va boshqalarni o‘z ichiga olgan aralashmalar, sepma kukunlar, bo‘yoqlar va pastalar qo‘llaniladi.

Qolip g‘ovaklariga erigan metall kirib qolishi. Mexanik kuyindi hosil bo‘lishi uchun metall qolip g‘ovaklariga qolip aralashmasi donasining diametridan kam bo‘lmagan chuqurlikka kirishi lozim. Buning natijasida quyma yuzasida metall va qolip aralashmasi donalaridan iborat to‘r paydo bo‘ladi. Uni faqat quymaning yuza qatlami bilan birgalikda kesib olib tashlash mumkin. Mexanik kuyindining hosil bo‘lish jarayonini quyidagicha tasavvur qilish mumkin. Qolipga quyilgan suyuq metall uning hali sovuq devorlariga tegib, sirtdan soviy boshlaydi. Natijada quyma sirtida qotgan qobiq hosil bo‘ladi. Bu qobiqning qalinligi quyilayotgan metallning haroratiga, qolipning harorati va issiqlik to‘plash qobiliyatiga hamda boshqa omillarga bog‘liq. Agar quyma nisbatan yupqa devorli bo‘lsa, quymaning butun massasi keyinchalik kristallanishida ajralib chiqadigan issiqlik dastlab hosil bo‘lgan qobiqni qayta eritish va suyuq metallning qolip devorlari bilan uzoqroq vaqt aloqada bo‘lishini ta’minlash uchun yetarli bo‘lmaydi. Bunday sharoitda mexanik kuyindi hosil bo‘lmaydi.

Agar xuddi shu sharoitda yirik qalin devorli quyma quyilsa, dastlab hosil bo‘lgan qobiq qotayotgan quymaning issiqligi ta’sirida qayta eriydi va suyuq metall qolip devorlariga tegadi. Biroq, metallning qolip g‘ovaklariga (kapillyarlariga) kirishi darhol boshlanmaydi, chunki qolip materiallari suyuq metall bilan ho‘llanmaydigan qilib tanlanadi.

Ma’lumki, bunday sharoitda suyuqlikning kapillyarlarga kirishiga qarshilik ko‘rsatadigan rk kapillyar qarshi bosim paydo bo‘ladi. Bundan tashqari, qolipning nisbatan past harorati metallning kirib borishiga to‘sqinlik qiladi. Qolip devorlari qizigani sayin qolip aralashmasidan suv bug‘lari va gazlar ajralib chiqib, g‘ovaklarda rg gaz qarshi bosimini hosil qiladi, bu ham metallning kirishiga to‘sqinlik qiladi.

Keltirilgan ma’lumotlarga ko‘ra, minimal kritik bosim suyuq po‘lat ustunining 0,8 metr balandligiga, maksimal bosim esa 3,6 metr balandligiga to‘g‘ri keladi.

Sovuq qolipda, agar metallning qolip devoriga bosimi kritik bosimga teng bo‘lsa, metall qolip g‘ovaklariga dona diametrining yarmidan ko‘p bo‘lmagan chuqurlikka, ya’ni millimetrning ulushlarigacha kirib boradi. Qolip sirti qizdirilganda, kritik bosim ostidagi metall, metallning erish haroratiga mos keluvchi izoterma tarqalishi bilan qolipning ichkarisiga kirib boradi.

Agar qolip aralashmasi suyuq metall bilan ho‘llansa, suyuq metallga tashqi bosim ta’sir qilmasdan ham u qolip g‘ovaklariga kirib boradi (so‘riladi). Eritish va quyish paytida metallning muqarrar oksidlanishi bu jarayonga yordam beradi, chunki oksidlar qolip materialini namlaydi.

Qolipning yoki sterjenlarning chiqib turgan qismlariga metallning butunlay yoki qisman singib ketishi metallashish deb, metallning ayrim nisbatan katta yoriqlar va g‘ovaklarga singib ketishi esa teshik ochish deb ataladi.

Mexanik kuyishning oldini olish uchun, avvalo, qolipning yuza qatlamidagi g‘ovaklar o‘lchamini kamaytirish lozim. Buning uchun maydaroq qumlar qo‘llaniladi yoki yirik va o‘rta donali qumlarga mayda fraksiyalar, jumladan changsimon kvars qo‘shiladi. Qolip aralashmasini taxminan 10-15 kgk/sm² bosim ostida presslab zichlash quymalardagi mexanik kuyishni sezilarli darajada kamaytiradi. Presslash jarayonida kuzatiladigan zichlashtirilgan qolip aralashmasi zichligining 1400 kg/m³ dan (qattiqlik o‘lchagich bo‘yicha 65 birlik) 1600 kg/m³ gacha (qattiqlik 85 birlik) oshishi kritik kirish bosimini ikki barobar ko‘paytiradi.

Mexanik kuyishning oldini olish uchun turli qoplamalar - bo‘yoqlar, pastalar va surtiladigan moddalar keng qo‘llaniladi, chunki ular qoliplar va o‘zaklarning yuza qatlamidagi g‘ovaklikni ham kamaytiradi. Po‘lat quymalar uchun kuyishga qarshi bo‘yoqlarga kuchli oksidlovchilar qo‘shish tavsiya etiladi. Ular qolip aralashmasi donalari orasidan sizib o‘tgan metallni oson ajraladigan g‘ovak oksidlarga aylantiradi va shu bilan kuyishning oldini oladi. Yirik, asosan po‘lat quymalar olishda mexanik kuyishning oldini olish uchun xromli temirtoshdan tayyorlangan pishib birikuvchi aralashmalar va qoplamalar ishlatiladi.

Alohida mas’uliyatli quymalar yuqori issiqlik to‘plash qobiliyatiga ega bo‘lgan olovbardosh materiallar, masalan, xrommagnezit yoki sirkon aralashmasi bilan qoplangan qoliplarda tayyorlanadi. Kvars qumiga nisbatan yuqori sovitish qobiliyatiga ega bu aralashmalar mexanik kuyishni kamaytiradi, suyuqlanmaning kirish chuqurligini taxminan ikki baravar pasaytiradi. Issiqlik to‘plash qobiliyati yuqori bo‘lgan materiallardan tayyorlangan kuyishga qarshi bo‘yoqlar qatlam qalinligi juda kichik bo‘lganligi sababli quymalarga sovituvchi ta’sir ko‘rsatmaydi.

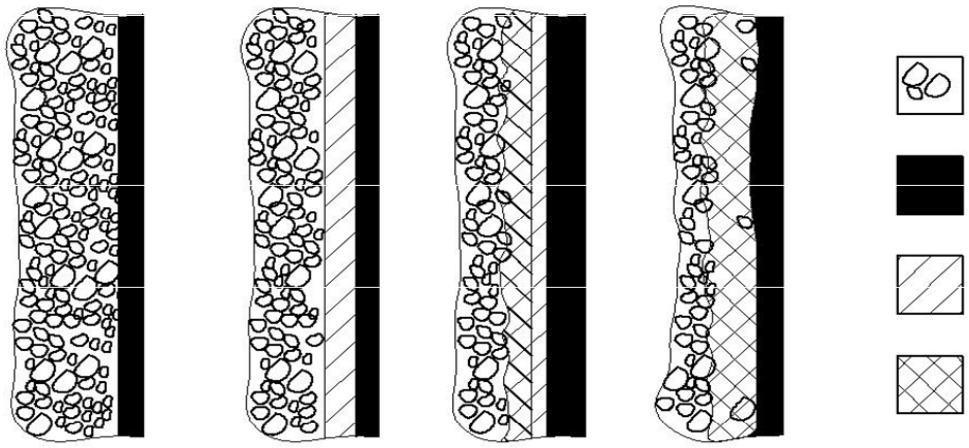
Cho‘yan va mis qotishmalaridan quymalarga mo‘ljallangan bo‘yoqlarga gaz hosil qiluvchi moddalar (yog‘och ko‘mir, toshko‘mir, koks, pek va boshqalar) qo‘shiladi. Bu moddalar yonganda ajralib chiqadigan gazlar aralashma g‘ovaklaridagi gaz bosimini oshiradi va metallning kirib borishiga to‘sqinlik qiladi.

Kimyoviy kuyish yuqori erish haroratiga ega qotishmalardan olingan quymalarda quyma metali, uning oksidlari va qolip materiali o‘rtasidagi murakkab

reaksiyalar natijasida yuzaga keladi. Mexanik kuyishdan farqli o‘laroq, kuygan qatlamdagi qum donalari asosan yuqori haroratda sodir bo‘ladigan kimyoviy reaksiyalar mahsulotlari, xususan silikatlar bilan bog‘lanadi.

P. P. Berg nazariyasiga ko‘ra, kimyoviy kuyindi hosil bo‘lish jarayoni shartli ravishda uch bosqichga bo‘linadi: metall sirtining oksidlanishi; qolip sirtining metall oksidlari bilan ho‘llanishi; metall oksidlari bilan qolip oksidlari orasida birikmalar hosil bo‘lishi (oraliq birikma, ya’ni kuyindi qatlam hosil bo‘lishi).

Q.



1-rasm. *Kimyoviy kuyish*

Metall-qolip ajralish yuzasiga qotishma tarkibiy qismlarining oksidlari ikki yo‘l bilan keladi: oz miqdorda - suyuqlanmada erigan va eritish hamda qolipni to‘ldirish paytida hosil bo‘lgan oksidlar ko‘rinishida, asosan esa quymaning qizigan qotayotgan yuzasining oksidlanishi natijasida. Cho‘yan yoki po‘latdan yasalgan yirik quyma qizigan holatda uzoqroq turadi va shu sababli uning yuzasida ko‘proq oksidlar hosil bo‘ladi.

Kuyindi ikki holda: quyma sirti oksidlanmaganda yoki juda kuchli oksidlanganda hosil bo‘lmaydi deb hisoblanadi. Oksidlanmagan metall sirtida kuyindi hosil bo‘lishi mumkin emas, chunki qolipning kremnezemi bilan faqat metall oksidlari o‘zaro ta’sirlashadi; oksidlanmagan metallning kremnezem bilan o‘zaro ta’siri ehtimoldan yiroq.

K. I. Vashchenko va S. P. Doroshenko kuygan po‘stloqda temir oksidlari miqdori qalinligi bo‘yicha metall bilan tutash joyidagi maksimal darajadan dastlabki tarkibdagi zichlangan qolip aralashmasiga tutashgan qatlamlarda minimal darajagacha kamayishini aniqladilar. Agar quyma metali bilan kuygan qobiq orasida optimal qalinlikdagi temir oksidlari qatlami hosil bo‘lsa (suyuq shisha aralashmalari uchun u taxminan 100 mkm), u holda kuygan po‘stloq shu qatlam bo‘ylab metalldan oson ajraladi. Oksidlar qatlami qalinligi kichik bo‘lganda kuygan qobiq quyma bilan mustahkam birikadi.

Po‘lat va cho‘yan quymalarda turli darajadagi qiyinchiliklar bilan kuyindi paydo bo‘lishining sababini bunday tushuntirish amaliy kuzatuvlar bilan yaxshi mos keladi. Masalan, tez soviydigan kichik po‘lat quymalarda metall sirtida qalinligi uncha katta bo‘lmagan oksidlar qatlami hosil bo‘lganda, kuyib qolishning oldini

olish uchun metall oksidlarining qolip kremnezyomiga bevosita tegishini to‘xtatish maqsadida o‘tga chidamli purkagich yoki yupqa bo‘yoq qatlami qo‘llash kifoya. O‘rtacha og‘irlikdagi po‘lat quymalarda kuyishdan saqlanish ancha mushkul, chunki bu yerda quymalar sirtida oksidlar kichik quymalardagiga qaraganda ko‘proq miqdorda hosil bo‘ladi, biroq oson ajraladigan kuyishni ta’minlaydigan optimal qalinlikdagi oksid qatlamini hosil qilish uchun yetarli emas.

Qoplamalar qo‘llanilmagan suyuq shisha qoliplarda olingan qalin devorli po‘lat quymalarda oson ajraladigan kuyundi hosil bo‘ladi, chunki po‘lat oson oksidlanadi va kuyundi qobig‘ida ko‘p miqdorda oksidlar hosil qiladi. Shu bilan birga, kuyishga qarshi qoplamalarsiz xuddi shu suyuq shisha qoliplarda olingan cho‘yan quymalarda qiyin ajraladigan kuyindi paydo bo‘ladi. Bu cho‘yan quymalar sirtining qizdirilganda qiyinroq oksidlanishi bilan izohlanadi.

Ma’lumki, qolipdan tez chiqarilgan quymalardagi kuyundi, qoliplarda uzoq vaqt sovitilgan quymalarga qaraganda qiyinroq tozalanadi, chunki metall va qolip o‘rtasidagi aloqa qisqa bo‘lganligi sababli quyma yuzasidagi oksid qatlami optimal qalinlikka yetmaydi. Shuningdek, po‘lat quymalar toblanganidan so‘ng, po‘stloq ostidagi metall sirti zang bilan qoplanganda, kuyundi po‘lat quymalar yuzasidan osonroq ketishi ham ma’lum.

Quymalar yuzasida hosil bo‘ladigan temir oksidi FeO ning erish harorati 1380°C bo‘lib, shu sababli hatto kristallangan po‘lat quyma yuzasida ham u ancha vaqt suyuq holatda qolishi mumkin.

Tarkibida marganes miqdori yuqori bo‘lgan qotishmalarda kuyundi hosil bo‘lishiga marganes oksidi va kremnezem o‘rtasidagi o‘xshash reaksiya ham ko‘maklashadi.

Bu reaksiyalar natijasida hosil bo‘lgan oson eriydigan fayalit (2Fe0-Si02) va tefroit (2MnO-Si02) silikatlar qotgandan so‘ng qum zarrachalarini kuyundi qatlamiga birlashtiradi. Temir oksidi va marganes oksidining kremnezem bilan o‘zaro ta’sirini oldini olish uchun qolip yuzasiga hosil bo‘ladigan metall oksidlariga nisbatan befarq bo‘lgan yuqori olovbardosh qoplamalar qo‘llaniladi.

So‘nggi paytlarda kimyoviy kuyishning oldini olishning quyidagi asosiy yo‘nalishlari belgilandi: qolipdagi metallni oksidlanishdan himoya qilish; oson ajraladigan kuyish hosil qilish maqsadida quyma yuzasi bilan kuyish qobig‘i orasida optimal qalinlikdagi oksid pardani yaratish; yuqori o‘tga chidamli hamda metall va uning oksidlariga nisbatan kimyoviy jihatdan inert bo‘lgan qoplamalar va qoliplash materiallarini qo‘llash.

Metallni quyish vaqtida oksidlanishdan saqlash uchun qoplamalar va aralashmalar tarkibiga organik moddalar qo‘shiladi. Bu moddalar eritma bilan to‘qnashganda yonadi yoki pirogen parchalanib, qolipda qaytaruvchi muhit hosil bo‘lishiga ko‘maklashadi.

Eng kuchli oksidlanadigan legirlangan po‘lat quymalarni olishda qaytaruvchi muhit yaratish uchun quruq qoliplar odatdagi kuyishga qarshi qoplamalar ustidan qo‘shimcha ravishda asfalt laki bilan bo‘yaladi.

Xuddi shu maqsadda cho‘yan quyishda aralashma va qoplamalarga uglerod saqlovchi moddalar: toshko‘mir va yog‘och ko‘mir kukuni, peklar, mazut va

boshqalar qo‘shiladi. Bunda hosil bo‘ladigan qaytaruvchi muhit kimyoviy kuyishning paydo bo‘lishiga to‘sqinlik qiladi yoki temirning yuqori oksidlarini quyi oksidlargacha qaytaradi, bu esa oson ajraladigan kuyishning shakllanishiga yordam beradi.

Qaytaruvchi atmosfera qolip bo‘shlig‘ida suyuqlanmaning dastlabki qismlari kelib tushgan paytdan boshlab hosil bo‘lishi va metall hamda qolip oksidlari o‘rtasidagi kimyoviy o‘zaro ta’sir yakunlanguncha saqlanib qolishi lozim. Allaqachon hosil bo‘lgan oksidlarni qaytarish uchun qoplamalar tarkibiga faol qaytaruvchilar: alyuminiy, marganes, titan va boshqalar qo‘shiladi.

Qotayotgan quymaning oksidlanishini oldini olishning bir usuli - qolip yuzasida kislorod kirishiga to‘sqinlik qiluvchi qovushqoq erigan shlak pardasi sun’iy ravishda hosil qilishdir. Bu maqsadda bo‘yoqlar tarkibiga ishqorlar, suyuq shisha yoki eritilganda qovushqoq shlaklar hosil qiluvchi tuzlar kiritiladi.

Oson ajraladigan kuyindini olish maqsadida quyma yuzasi va kuyundi qobig‘i orasida optimal qalinlikdagi oksid pardasi hosil qilish yirik po‘lat quymalar olishda qo‘llaniladi. Bunday hollarda, yuqori harorat tufayli metall oksidlanishi jadal kechadi va hosil bo‘lgan oksid pardasining qalinligini kuyindi qobig‘ini oson ajratishni ta’minlaydigan optimal darajagacha oshirish osonroq bo‘ladi. Bu maqsadda kuyishga qarshi bo‘yoqlar, pastalar va yopishqoq o‘tga chidamli materiallar, jumladan xromit yoki magnezitdan tayyorlangan aralashmalar ishlatiladi. Qotib qolgan, temir oksidlarini o‘tkazmaydigan qobiq quyma yuzasida temir oksidlari qalinligini oshirishga ko‘maklashadi. Shu maqsadda qoplamalar tarkibiga temir va marganes oksidlari kukunlarini qo‘shish tavsiya etiladi. Po‘lat quymalar olishda yuqori o‘tga chidamli materiallar sifatida sirkon, disten-sillimanit, korund va temir hamda uning oksidlariga inert bo‘lgan boshqa materiallar qoplamalar tayyorlashda qo‘llaniladi. Yuqori marganesli po‘latlardan quymalar olish uchun asosiy o‘tga chidamli materiallar - magnezit va magnezit-xromit ishlatiladi. Cho‘yan va rangli qotishmalardan quymalar uchun bo‘yoqlarda grafit, koks va talk qo‘llaniladi.

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TOSHKENT VILOYATI HUDUDLARINING IQTISODIY - IJTIMOIY RIVOJLANISH KO'RSATKICHLARI

Annontatsiya. *Ushbu maqolada Toshkent viloyati resurslarning hududlar bo'ylab tasimlanishi, viloyat ijtimoiy – iqtisodiy ko'rsatkichlari tahlil etilgan. Viloyatni ijtimoiy – iqtisodiy rivojlantirish yo'nalishlariga doir yechimlar berilgan. Hamda, viloyatdagi mavjud resurslarda to'laqonli va samarali foydalanish bo'yicha yechimlar berilgan.*

Kalit so'zlar. *Toshkent viloyati, ijtimoiy-iqtisodiy rivojlanish, bandlik, ishsizlik, ta'lim, sog'liqni saqlash, sanoat, qishloq xo'jaligi.*

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ECONOMIC AND SOCIAL INDICATORS OF DEVELOPMENT OF REGIONS OF TASHKENT REGION

Abstract. *This article analyzes the distribution of resources of Tashkent region by regions, socio-economic indicators of the region. Solutions are given on the directions of socio-economic development of the region. Solutions on full and effective use of available resources of the region are also given.*

Keywords. *Tashkent region, socio-economic development, employment, unemployment, education, health care, industry, agriculture.*

Kirish. Toshkent viloyati O'zbekistonning shimoli – sharqiy qismida joylashgan. Viloyatning hududi tog'li va tekisliklardan iborat. Shimol va shimoli – sharq – Qozog'iston, janubi – sharq – Qirg'iziston, janub va g'arb – o'zbekistoning ichki hududlari (Namangan, Sirdaryo, Jizzax viloyatlar). Toshkent viloyati 1938 yil tashkil topgan bo'lib, viloyat tarkibida 15 ta tuman, (Bo'ka, Bekobod, Bo'stonliq, Zangiota, Oqqo'rg'on, Ohangaron, Parkent, Piskent, Chinoz, Yuqori Chirchiq, Yangiyo'l, O'rta Chirchiq, Qibray, Quyi Chirchiq); 17 ta shahar (Angren, Bekobod, Bo'ka, Do'stobod, Keles, Olmaliq, Oqq'org'on, Ohangaron, Parkent, Piskent, Toshkent, To'ytepa, Chinoz, Chirchiq, Yangiyo'l, Yangiobod, G'azalkent); 18 shaharcha (Alimkent, Bo'zsuv, Gulbahor, Zafar, Iskandar, Krasnagorsk, Nurobod, olmazor, Salor, Tuyabog'iz, Chig'iriq, Chorvoq, eshonguzar, Yangibozor, Yangi Chinoz, Yangihayot, O'rtaovul) mavjud. Ma'muriy markazi Nurafshon shahri. Maydoni 15300 km ga teng. Hudud O'zbekistonning shimoli – g'arbida, Tyanshan tog'i bilan Sirdaryo daryosi oralig'ida joylashgan.

Hududlarning ijtimoiy – iqtisodiy rivojlanish ko'rsatkichlarini o'rganishning ahamiyati juda katta. Xususan, rejalashtirish va strategik rivojlanish; Bunda hududning kuchli va zaif tomonlarini aniqlash orqali kelajakdagi rivojlanish rerjalari ishlab chiqiladi. Iqtisodiy o'sishning qaysi sohalarda ustuvor bo'lishi lozimligini ta'minlaydi. Investitsiyalarni jalb qilish; rivojlanish darajasi yuqori bo'lgan hududlarga investorlar ko'proq qiziqadi. Kam rivojlangan hududlarni aniqlash va ularga davlat yoki xususiy sektor tomonidan investitsiyalar yo'naltirishga yordam beradi. Aholini faravonligini aniqlash; Bandlik, daromad darajasi, infratuzilma va xizmatlar sifatini baholash orqali aholi hayot darajasini yaxshilash choralari ko'riladi. Hududlar o'rtasidagi tengsizlikni kamaytirish uchun ijtimoiy dasturlar ishlab chiladi. Resurslarni samarali taqsimlash; Davlat va xususiy sektor resurslarini eng muhim va dolzarb yo'naltirish imkonini beradi. Kam rivojlangan hudlarda infratuzilma, aholiga xizmat ko'rsatish sohalari uchun mablag'lar ajratiladi. Muammolarni hal qilish: ishsizlik qashoqlik, migratsiya kabi muammolarni aniqlash va ularga yechimlarni topishga yordam beradI. Ekologik muammolar yoki iqtisodiy tanazzul xavflarini oldindan bilish va ularga tayyorgarlik ko'rish imkonini beradi.

Ma'lumki, hudud maydoni qanchalik katta bo'lsa, uning bor xususiyatlarini o'rganish birmuncha qiyinroq kichadi. Chunki, hududlarning iqtisodiy – ijtimoiy, geografik xususiyatlari turlicha va ayrim hollarda bir – biridan keskin farq qilishi ham mumkin. Hududlarning ijtimoiy – iqtisodiy rivojlanish ko'rsatkichlarini o'rganish quyidagi asosiy yo'nalishlarda olib boriladi;

Asosiy qism. Toshkent viloyati hududining ijtimoiy rivojlanish ko'rsatkichlari;

Demografik holati; Toshkent viloyati aholisi 2024 – yil (1- oktabr)holatiga ko'ra, doimiy aholi soni 3094,9 ming kishini tashkil ilgan. Va yil boshidan 43,1 ming kishiga yoki 1,4 % ga ko'paydi. Shahar aholisining ulushi 50,3% va qishloq aholisi 49,97% ni tashkil etgan.

Aholining zichligi 201.2 kishi/km^2 Diniy tarkibida musulmonlar yetakchilik qiladi. Milliy tarkibida o'zbeklar (60.9%), qozoqlar (14,3%), ruslar (8.1%), tojik (5.0%), koreys, ukrain va boshqa 80 dan ortiq millat vakillari yashaydi.

1 - rasm. Toshkent viloyati doimiy aholisining yashash joyi bo’yicha taqsimlanishi

Ta’lim sifati. Aholining savodxonlik darajasi oliy ma’lumotlilarning ulushi birmuncha pastroq. 2023/2024 – o’quv yilining boshiga Toshkent viloyatida jami 7256 ta talaba oliy ta’lim muassalarida ta’lim olmoqda. Viloyat aholisining tarkibida oliy ma’lumotlilar ulushi birmuncha pastroq, buni abituriyentlarning har yili oliy o’quv yurtlariga kirish ko’rsatkichlaridan bilib olish mumkin. (10- o’rin). Endilikda viloyat aholisi uchun ta’lim sohasidagi xizmatlar hajmi (2024 – yil yanvar – avgust)1259,1 mlrd so’mni hamda o’sish 46,7 % ni tashkil etgan. Bu yuqoridagi muammoning yechimi sifatida qaratilmoda.

Migratsiya saldosi bir necha yillar davomida manfiy ko’rsatkichga ega bo’lgan. Ammo, hozirgi kunga kelib migratsiyaning manfiy saldosi qisarib bormoda. Bu iqtisodiyotning va aholi turmush tarzining o’sishi biloan bog’liq. Masalan; 2004 – yilda ko’chib kelganlar 25777 kishini, ko’chib ketganlar esa 36961 kishini, migratsiya saldosi manfiy ya’ni -11184 kishini tashkil qilgan. 2016 – yilda esa ko’chib kelganlar 19689 kishini, ko’chib ketganlar esa 25425 kishini, migratsiya saldosi manfiy ammo, 2004 – yilga nisbatan kamaygan – 5736 kishi.

Bandlik va ishsizlik darajasi. Viloyat agroiqlimiy resurslarga boyligi sababli qishloq xo’jaligi yaxshi rivojlangan. Va shunga mos ravishda aholining katta qismi qishloq xo’jaligi sohalarida band. Ishchi kuchining ko’pligi bu yerda ishchi ko’p talab qilinadigan sohalarda qo’l keladi. Masalan; sanoatning to’qimachilik yoki tikuvchilik tarmoqlarini rivojlantirish uchun inson omili yetarlicha. Faqatgina tog’li tumanlarda bu biroz samaradorligi kamroq bo’lishi mumkin, sababi bunday hududlarda aholi tarqoq joylashgan ya’ni aholi zichligi past ko‘rsatkichga ega bo’ladi.

Sog’liqni saqlash; 2024 -yil 1- yanvar holatiga Toshkent viloyatida kichik tadbirkorlik subyeki sifatida faoliyat yuritayotgan barcha mutahasislikdagi shifokorlar jami soni 18,5 ming kishini tashkil etgan. 2019 – yilga nisabatan shifokorlar soni 8 ming kishiga ko’paygan. 2024 – yilning yanvar – noyabr oylarida

Toshkent tumanida sog'liqni saqlash sohasidagi xizmatlar hajmi jami 185,8 mlrd so'mni tashkil etdi. O'tkan yilning mos davriga nisbatan +9,9% bo'ldi. Hududning jami sog'liqni saqlash sohasasidagi ximzatlar bo'yicha ulushi 12,7% hissasiga to'g'ri keldi. Tibbiyot sohasida O'zbekiston Markaziy Osiyo davlatlar orasida yetakchi o'rinni egallaydi. Shu sababli ham sog'liqni saqlash sohasidagi xizmatlar ulushi ortib bormoda.

Madaniyat va sport; Viloyatda "O'zbekiston Respublikasi Madaniyat va Sport ishlari vazirligini tashkil etish to'g'risida" gi qarordan so'ng ko'plab islohatlar amalga oshirildi. Masalan; yaqinda zamonaviy sport majmuasi foydalanishga topshirildi. Viloyatda sport infrtuzilmasi ham rivojlanib, 49 ta stadion, 16 ta suzish havzasi, 38 ta tennis korti, 624 ta sport zali va boshqa sport inshoatlari faoliyat ko'rsatmoqda. Bugungi kunda 1701 ta jismoniy tarbiya jamoalarida 600 mingga yaqin kishi sport bilan shug'ullanadi.

2- rasm. Toshkent viloyatidagi zamonaviy sport majmuasi

Shuningdek, viloyatda O'zbekiston davlat jismoniy tarbiya va sport universiteti, 26 ta sort maktabi, 4 ta ixtisoslashgan sport maktabi, Chirchiq olimpiya va paralimpiya sport turlariga tayyorlash markazi va futbol akademiyasi faoliyat yuritib, 1325 nafar murabbiy 34 mingdan ziyod yoshlarni sport bilan muntazam shug'ullantirmoda.

2.Toshkent viloyati hududining iqtisodiy ko'rsatkichlari;

Hudud yalpi ichki mahsuloti (YIM) va yalpi hududiy mahsulot (YHM);

2024 – yilning yanvar – sentabr oylarida viloyatda YAHM deflyatori indekisi 2023- yilning yanvar sentabr oylaridagi narxlarga nisbatan 113,0 foizni tashkil etdi. Ahamiyatli jihati shundaki, YAHM defloratsiyasining eng yuqori ko'rsatkichlari

sanoatda – 115,5%, va xizmatlar sohasida – 113% qayd etildi.

3- rasm. 2023 - 2024 yillarning yanvar – sentabr oylarida YAHMning iqtisodiy faoliyat turlari bo'yicha ko'rsatkichlari

2024 – yilda 2023 – yilga nisbatan YAHMda sanoatning ulushi ortib, qishloq xo'jaligining ulushi esa kamayib bormoqda. Bu o'z navbatida viloyat iqtisodiyotida qishloq xo'jaligi tendensiyasi kamayib, sanoatning o'sishi shaharlashuv va shahar turmush tarzining tarkib topishiga turtki bo'lmoda.

Sanoat rivoji. 2024 – yilning yanvar – noyabr oylarida Toshkent viloyatida sanoat ishlab chiarish tarkibida eng katta ulush ishlab chiqaradigan sanoat hissasiga to'g'ri kelib 100637,1 mlrd so'mni, jami sanoat ishlab chiqarishdagi ulushi 84,4% ni tashki etdi.

4 - rasm. Sanoat ishlab chiqarishning asosiy tarmoqlari

Toshkent viloyatida 2024 – yilning yanvar – noyabr oylarida aholi jon boshiga sanoat mahsulotlari ishlab chiqarilishi 38815,0 ming so'mni tashkil etdi.

Bu ko’rsatkich aholi ehtiyojlarini ishlab chiqarish mahsulotlariga nisbatan o’sib borayotganini bildiradi.

Toshkent viloyatining Zangiota tumanida – 962 ta, Qibray tumanida – 585 ta, Toshkent tumanida – 580 ta sanoat korxonalari mavjud bo’lib, bu viloyatdagi emg yuqori ko’rsatkichlar hisoblanadi. Odatda bu kabi tumanlarda sanoat tufayli yuzaga keladigan ekologik mummolar nafaqat tuman balki, chegaradosh bo’lgan tumanlar hududida ham ta’sirini sezish mumkin. Bu kabi muammolarini oldini olish maqsadida imkoni bo’lsa, sanoat korxonalari oz bo’lgan tumanlarga ko’chirish tavsiya etiladi. Aks holda, atrof – muhitning salbiy ta’sirning ortib borishini kuzatish mumkin.

Qayd etish kerakki, sanoat tarmog’i iqtisodiy faoliyat turlari ichida yuqori salohiyatiga ega bo’lgan tarmoqlardan biri hisoblanadi. Joriy yilning 1 – dekabr holatiga ko’ra viloyatimizda 6774 sanoat korxonasi faoliyat yuritmoda.

Qishloq xo’jaligi; 2024 – yilning yanvar – dekabr oylarida viloyatda yetishtirilgan qishloq xo’jaligi mahsulotlari hajmi 41371,6 mlrd so’mni yoki 2023 – yilning mos davriga nisbatan 101,6% ni, shu jumladan dehqonchilik mahsulotlari hajmi 19107,2 mlrd so’mni 99,85 hamda chorvachilik mahsulotlari hajmi 22264,4 mlrd so’mni (101,3%) tashkil qildi.

5- rasm. Xo’jaligi mahsulotlari yetishtirish hajmida dehqonchilik va qishloq chorvachilik ulushi (2024 – yil)

2024 – yilning yanvar – noyabr oylarida Toshkent viloyatining barcha hududlarida joylashgan dehqon bozorlarida qishloq xo’jaligi mahsulotlarining savdo aylanmasi hajmi 848,5 mlrd so’mni tashkil qildi. Bunda asosiy yirik hajmi yangi uzilgan qishloq ug’xo’jaligi mahsulotlari savdosiga (410,2 mlrd so’m) to’g’ri keladi. 2024 – yilning yanvar oyida sabzavot yetishtirilishi bo’yicha eng yuqori ko’rsatkich Bekobod tumanida 33517 tonna va Yangiyo’l 8420 tonna hissasiga to’g’ri kelmoda.

2024 – yilning yanvar – oktyabr oylarida Toshkent viloyatida 109,5 ming tonna meva va sabzavotlar eksporti amalga oshirilgan. Meva va sabzavotlarning eksport tarkibiga aralsa 48,3 mln. AQSH dollariga teng 94,9 ming tonnadan ortiq sabzavot shuningdek 41,1 mln. AQSH dollari iymatidagi 35,3 ming tonna meva va

rezavorlar eksport qilindi. Toshkent viloyatida dehqonchilik va bog'dorchilik uchun barcha tabiiy shart – sharoitlar yetarlicha ya'ni agroiqlimiy resurslarga boy sanaladi. Navlarni yaxshilash orqali yana ham bu ko'rsatkichlarni yaxshilash mumkin.

2024 -yilning 1 – oktabr holatiga ko'ra, Toshkent viloyatida barcha toifadagi xo'jaliklarda qoramollarning bosh soni 953,8 mingtaga yetgan. Ushbu ko'rsatkich o'tkan yilning mos davriga nisbatan 1,15 ga yoki 10 ming taga ko'paydi.

2024 – uilning 1 – oktabr holatiga ko'ra otlarning umumiy bosh soni 55830 taga yetdi. 2023 – yilning mos davri bilan solishtirganda, 630 taga yoki 1,2% ga ko'paydi. Bundan ko'rinib turibdiki, viloyat chorvachilik mahsulotlari ulushi ham katta.

6 – rasm; Toshkent viloyatida yetishtirilgan chorvachilik mahsulotlari ulushi (2024 y.)

2024 – yilning yanvar – sentabr oylarida Toshkent viloyatida chorvachilik mahsulotlarini yetishtirish hajmi 1660,3 mlrd so'mni yoki 2023 – yilning mos daveiga nisbatan 102,4% ni tashkil qildi. Yetishtirilgan qishloq xo'jaligi mahsulotlarining umumiy hajmida chorvachilik mahsulotlarining ulushi 56,8%ni tashkil ildi. Yetishtirilgan chorvachilik mahsulotlarining eng katta ulushi baliqqa to'g'ri kelgan.

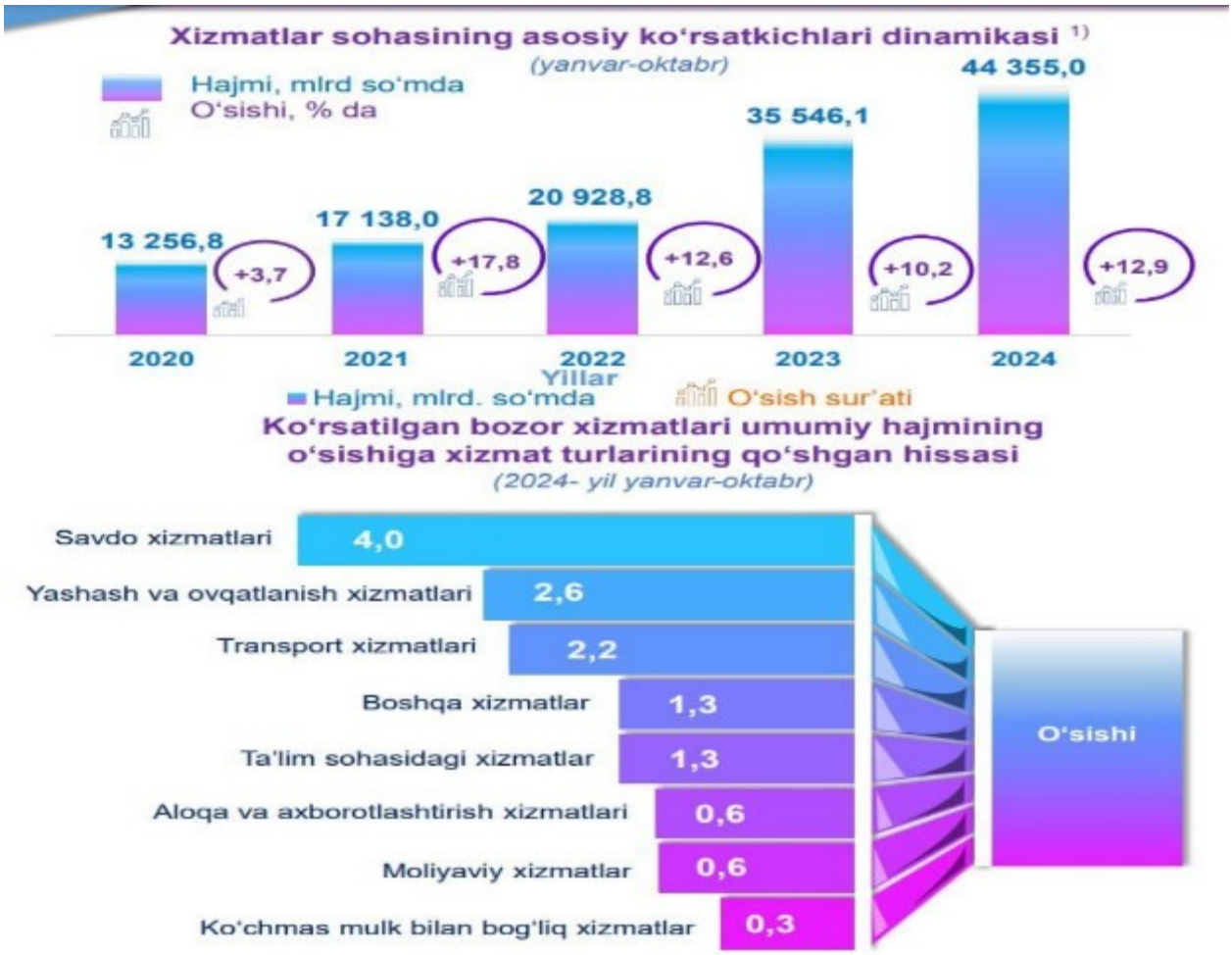
Savdo va xizmatlar sohasi. 2024 – yil yanvar – noyabr oylarida Toshkent viloyati tashqi savdo aylanmasida eksport hajmi 1780,8 mln ASH dollariga yetdi. O'tkan yilning mos davriga nisbatan 2,8%ga ko'paydi.

Import hajmi 3828,3 mln ASH dollariga va o'tkan yilning mos davriga nisbatan 9,0% ga ko'paydi. Endlikda bu ko'rsatkichda eksportning ulushini oshirish uchun. Iqtisodiyotni intensiv tashkil etish va eksportbob jahon talablariga mos mahsulotlar tayyorlash, chet el davlatlari bilan hamkorlik aloqalarini keng yo'lga qo'yish orqali erishish mumkin. Eksport tarkibida tovarlar ulushi 99,7 foizni tashkil etib, bular asosan sanoat tovarlari (62,3%), ozi – ovqat mahsulotlari va tirik hayvonlar (11,5%), turli xil tayyor buyumlar (11,8%) hissasiga to'g'ri kelmoqda. Bu borada tayyor buyumlar eksport qilish ko'rsatkichini yaxshilash lozim.

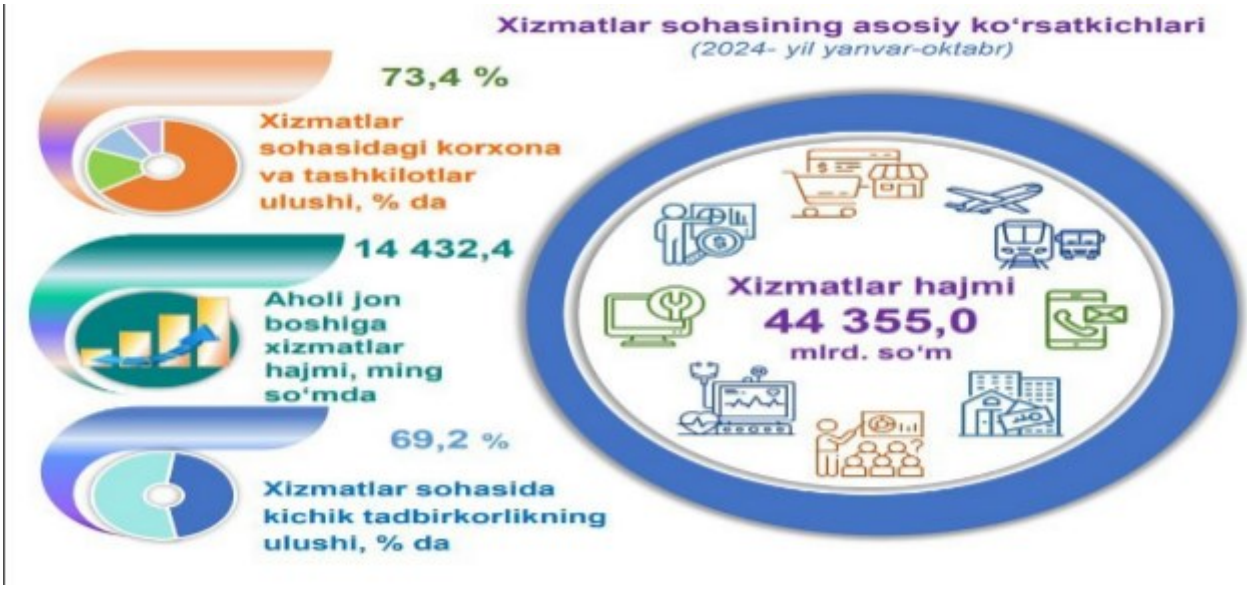
7 – rasm. Toshkent viloyatining MDH mamlakatlari bilan tashqi savdo aylanmasi

Ko'rsatilgan bozor xizmatlari umumiy hajmining o'sishiga xizmat turlaridan eng ko'p savdo xizmatlar sohasiga to'g'ri keladi. Xizmatlar sohasining asosiy ko'rsatkichlariga nazar solsak, 2020- yilga nisbatan 2024 – yilda deyarli 3,3 martta o'sganini ko'rish mumkin.

Toshkent viloyatining MDH davlatlari bilan tashqi savdo aylanmasi 2024 – yil yanvar – oktabr oylarida 2275,1 mln. AQSH dollarini tashkil etgan. Shundan eksport 699,2 mln AQSH dollariga yetgan bo'lsa, import 1575,9 mln. AQSH dollari qiymatida qayd etildi. Toshkent viloyatining MDH mamlakatlari bilan tashqi savdo aylanmasi eng yuqori hajmlari Rossiya (26,3%), Qozog'iston (12,4%) hamda Belarus (2,2%) davlatlari bilan qayd etildi.



8 - rasm. Xizmatlar sohasining asosiy ko’rsatkichlari dinamikasi, ko’rsatilgan bozor xizmatlari umumiy hajmining o’sishiga xizmat turlarining qo’shgan hissasi



9 - rasm. 2024 – yil yanvar – oktyabr oylarid Toshkent viloyatida xizmatlar sohasining asosiy ko’rsatkichlari

Shuningdek, turizm sohasi vioyat hududida yaxshi shakillanmagan. Faqatgina Bo'stonliq tumani turizm sohasiga ixtisoslashgan. Bo'stonliq tumani turizm sohasida nafaqat Toshkent viloyati balki, O'zbekiston turizmida yetakchi ro'l o'ynaydi.

Investitsiyalar. 2024 – yil yanvar – dekabr oylarida Toshkent viloyatida asosiy kapiatalga kiritilgan investitsiyalarning moliyalashtirish manbalariga ko'ra, eng yuqori ko'rsatkich (jami investitsiyalarning 41,3%i) bosha va kafolatlanmagan xorijiy investitsiya va kreditlar hisobiga (29084,8 mlrd.so'm) to'g'ri keldi.

Infratuzilma. Viloyatda transport xizmatlari bo'yicha 10 oyda ,7,7 trln. So'mdan ziyod xizmatlar ko'rsatildi. 2024 – yilning yanvar – oktabr oylarida Toshkent viloyatida transport xizmatlari hajmi 7762,9mlrd so'mni tashkil etib, 2023 – yilning mos davriga nisbatan ushbu xizmat turi 13,1% ga oshgan. Transport xizmatlarining umumiy hajmida 91,9% bilan avtomobil transport xizmatlari ustunlik qiladi.

Hududlar kesimida mazkur yo'nalishda nisbatan yuqori ko'rsatilgan xizmatlar ulushi Yangiyo'l tumanida (8,3%), Chirchiq shahrida (7,8%) hamda Angren shahrida (7,4%) hissasiga to'g'ri keladi. Albatta shahar hududlarda avtomobil transportidan ko'proq foydalaniladi.

2025 – yilning 1- yanvar holatiga ko'ra, viloyatimizda axborot va aloqa sohasida faoliyat ko'rsatayotgan korxonalar jami soni 620 ta bo'lib, 2024 – yilning yanvar – dekabr oylarida ushbu sohada 194 ta korxonalar yangi tashkil etilib, ularning hammasi kichik biznes subyektlaridir. Hududlar kesimida axborot va aloqa sohasida faoliyat ko'rsatayotgan korxona va tashkilotlar soni bo'yicha, Chirchiq shahri – 70 ta, Toshkent tumani - 64 ta, Angren shahri 52 ta bilan yetakchilik iladi. Chekka hamda tog'li tumanlarda bu ko'rsatkich 4 – 5 barobar kamroqni tashkil etadi.

Xulosa. Umuman olganda Toshkent viloyati iqtisodiy – ijtimoiy rivojlanish ko'rsatkichlari so'nggi 4-5 yilliklarda 10 foizdan kam bolmagan suratlarda o'sib kelmoqda. Buni O'zbekiston hududidagi boshqa viloyatlarga nisbatan solishtirganda bu ko'rsatkich nisbatan yaxshi hisoblanadi. Ammo, viloyat hududidagi mavjud tabiiy va ijtimoiy – iqtisodiy resurslar bo'yicha solishtirganda, viloyatlar ichida eng oldingi o'rinlarni egallaydi. Bundan ko'rinib turibdiki, viloyat hududida mavjud barcha resurslardan to'laqonli intensiv foydalanilmagan. Viloyat mavjud resurslaridan to'laqonli , samarali va intensiv holda foydalanish orqali iqtisodiy samaradorlikda yuqori natijalarni qayd etish bilan birga aholining turmush darajasi va ijtimoiy ko'rsatkichlar ham hamohang holda yaxshilanishiga erishish mumkin.

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BO'LAJAK MATEMATIKA O'QITUVCHILARINING KASBIY KOMPETENTSIYASINI SHAKLLANTIRISH METODIKASI

Annotatsiya: *Ta'limda kompetensiyaga asoslangan yondashuv axborot jamiyatida kasbiy harakatlarni amalga oshirishga qodir bo'lgan va maktab o'quvchilariga zamonaviy jamiyat talablariga muvofiq ta'lim beradigan zamonaviy o'qituvchini tayyorlashga qaratilgan.*
Kalit so'zlar: *kompetentsiya, fundamental, algoritmik, kombinatsion.*

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METHODOLOGY FOR THE FORMATION OF PROFESSIONAL COMPETENCIES IN PROSPECTIVE MATHEMATICS TEACHERS

Annotation: *The competency-based approach in education is aimed at preparing a modern teacher who is capable of carrying out professional activities in the information society and providing students with education that meets the requirements of contemporary society.*
Keywords*: Competency, fundamental, algorithmic, combinational.*

O'qituvchining yangi kasbiy standartini joriy etish oliy ta'limda bo'lajak o'qituvchini tayyorlash bo'yicha strategik ko'rsatmalarni tubdan qayta ko'rib chiqishni talab qiladi, chunki jamiyat va davlatning intellektual rivojlanishi aynan ularga bog'liq. Buning uchun pedagogika oliy o‘quv yurtida dars berish jarayonida muayyan shart-sharoit va vaziyatlar yaratilishi, har qanday kompetentsiyani shakllantirish zarur.

Pedagogika institutlarida matematika fanlarini o'rganishda bo'lajak o'qituvchining kasbiy kompetentsiyasini shakllantirishning o'ziga xos xususiyatlari matematik bilimlarning, pedagogik tayyorgarlikning o'ziga xosligi va kelgusi kasbiy faoliyati bilan bog'liq. Matematik bilimlarning o'ziga xos xususiyatlariga “ularning yuqori darajadagi mavhumligi va shunga mos ravishda ramziy yozuvlardan keng foydalanish imkoniyati, umumlashtirilgan modellarni qurish va dinamik jarayonlarni modellashtirish, shuningdek ularning mantiqiy uyg'unligi, nazariy bilimlarning o'zaro bog'liqligi va elektron hisoblash texnikasi yordamida tizimli ravishda aks ettirilishi mumkin bo'lgan qoidalar kiradi”.

Pedagogika institutlarda matematika o‘qituvchisini tayyorlash tizimida ko‘pchilik tadqiqotchilar (R.M.Aslanov, A.V.Sinchukov, V.A.Testov) kasbiy kompetensiyaning uchta komponentini ajratib ko‘rsatadilar:

- mazmunli (maxsus matematik bilimlarga ega bo'lish);
- texnologik (matematikani o'qitishning texnika va usullarini o'zlashtirish);
- shaxsiy (ushbu kasb bo'yicha mutaxassis uchun zarur bo'lgan shaxsiy fazilatlarga ega bo'lish) [3].

Oliy o'quv yurtlarida bu tarkibiy qismlarning birinchisi an'anaviy tarzda ko'proq shakllanadi.

Kasbiy kompetentsiyaning muhim tarkibiy qismi bo'lgan bo'lajak matematika o'qituvchisining fundamental matematik tayyorgarligi sifati doimo institut jamoatchiligining diqqat markazida bo'lib kelgan.

Ma'lumki, pedagogik ta'limning o'ziga xos xususiyatlaridan kelib chiqqan holda, pedagogika oliy o'quv yurtlarida mutaxassislarning matematik tayyorgarligi klassik va texnik universitetlardagi tegishli tayyorgarlikdan farq qilishi kerak. Bo'lajak matematika o'qituvchisi unga maktabda o'qitiladigan matematika kursidan tashqari mazmunli bilim, ko'nikma va qobiliyatlarni ta'minlaydigan fundamental matematik ta'lim olishi kerak. Tabiiyki, bunday o'qitish kelajakdagi o'qituvchining kasbiy faoliyatidan ajralgan holda amalga oshirilmasligi kerak.

Bo'lajak matematika o'qituvchisi kasbiy kompetentsiyasining mazmunli komponenti matematika fanlarini o'qitishda muayyan kurs va tegishli maktab o'quv predmeti o'rtasidagi aloqani o'rnatish vazifalaridan birini qo'yadi A.G. Mordkovich. Bunday aloqa har bir matematik kursning etakchi g'oyasi bo'lishi kerak. Pedagogika oliy o‘quv yurtining matematika fanlarini o‘qitishda ushbu g‘oyani amalga oshirish talabalarga ular tomonidan qo‘yilgan kurs savollari bilan umumta’lim maktabi matematika kursi o‘rtasidagi bog‘liqlik haqida aniq bilim va aloqa o‘rnatishni, mantiqiy fanlarni ochib berishni nazarda tutadi.

Bo'lajak matematika o'qituvchisining kasbiy kompetensiyasining texnologik tarkibiy qismini shakllantirish uchun ma'lum uslubiy tayyorgarlik talab etiladi. Ushbu komponent pedagogika universitetining barcha matematika kurslarini o'rganishda doimiy ravishda shakllantirilishi kerak. Binobarin, aniq matematika fanini o'rganish maqsadlari faqat fan bo'yicha bilim, ko'nikma va malakalarga qo'yiladigan talablarni sanab o'tish bilan cheklanib qolmay, balki yakuniy ta'lim natijasiga erishishga - shaxsni jamiyatda kelajakdagi kasbiy faoliyatga tayyorlashga qaratilgan bo'lishi kerak.

Bo'lajak o'qituvchining matematika o'qitishi, bu konsepsiyaga ko'ra, shunday tuzilishi kerakki, o'quvchilar tafakkurida paydo bo'ladigan g'oyalar o'rganilayotgan jarayon va mavzularning eng muhim tomonlarini aks ettiradi. Aynan idrok qilish psixologiyasi va xotiraning adekvat neyrofiziologik mexanizmlari asosida idrok ob'ektining (modelining) ana shu asosiy sifatlarini shakllantirish matematikani o'rganish jarayonining mohiyatidir. Shu bilan birga, matematik harakatlar tartibini tuzatuvchi modellar alohida ahamiyatga ega.

Kasbiy kompetentsiyaning shaxsiy komponenti matematika o'qituvchisining samarali kasbiy faoliyati uchun zarurdir. Shaxsiy komponent matematika o'qituvchisining o'ziga xos shaxsiyatiga xos bo'lgan faoliyat uslubi orqali amalga oshiriladi.

Bo'lajak matematika o'qituvchisini kasbiy tayyorlash jarayonida unda (shu jumladan, mavzu va zamonaviy AKT yordamida) samarali fikrlash va idrok etish qobiliyatini, argumentatsiyaning mantiqiy foydaliligini shakllantirish va rivojlantirish kerak.

O`quvchilarning matematik faoliyati jarayonida ularning fikrlash texnika va usullari ro`yxati tabiiy ravishda induksiya va deduksiya, abstraksiya va analogiya, tasnif va tizimlashtirish, umumlashtirish va konkretlashtirish, tahlil va sintezni o`z ichiga oladi. Matematikani o'qitish "ijtimoiy-madaniy tajribaga asoslangan holda, talabalar o'rtasida mantiqiy, algoritmik va kombinatsion fikrlash sxemalarini shakllantirish, shubhasiz, aqliy mehnatning tashkiliy ko'nikmalarini shakllantirishga yordam beradi (o'z ishini rejalashtirish, uni amalga oshirishning oqilona usullarini topish, natijalarni tanqidiy baholash va boshqalar)» [1].

Bo'lajak matematika o'qituvchisining kasbiy kompetensiyasi nafaqat uning matematikaga tayyorgarligining ma'lum bir samarali darajasi (fan bo'yicha nazariy bilimlar, matematik ob'ektlar bilan ishlash ko'nikma va malakalari va boshqalar), balki psixologik, pedagogik va uslubiy bilimlarga ega bo'lishidir. O'qituvchining kasbiy kompetentsiyasining tuzilmasi uni yangi ta'lim paradigmasiga muvofiqlashtiradigan majburiy komponentlarni kiritmasdan, barkamol mutaxassis tayyorlash uchun zamonaviy talablarga javob bera olmaydi. Shu munosabat bilan bo‘lajak matematika o‘qituvchisining kasbiy masalalarni yechishda AKT vositalaridan foydalana olishi uning kasbiy kompetensiyasining tarkibiy qismlaridan biridir.

Ta'limni va butun jamiyatni axborotlashtirish muvaffaqiyati bo'lajak o'qituvchining axborot va kompyuter malakasiga bog'liq. Bolalarga maktab o‘quv dasturining asosiy fanlarini AKT vositalaridan foydalangan holda sifatli o‘rgatish, ularda axborot madaniyatini shakllantirish, shuningdek, o‘quvchilarni axborot texnologiyalarining murakkab olami bilan tanishtirishga tayyor va qodir o‘qituvchilar maxsus tayyorlangan bo‘lishi kerak [4].

Maktab matematika kursining mazmuni matematika fanining asoslari bo'lib, uning asosini matematik deb ataladigan maxsus tuzilmalar tashkil etadi. Ular etarli mavhumlikdir, chunki ular haqiqat bilan aniq aloqaga ega emas; Matematik tuzilmalarning har bir elementi uchun haqiqatan ham mavjud prototipni ko'rsatish mumkin emas. Ba'zi matematik tuzilmalar aniq hodisalarning to'g'ridan-to'g'ri modellari bo'lib, boshqalari ular bilan tushunchalar va mantiqiy tuzilmalarning uzoq zanjiri bilan bog'langan. Matematika fanining bunday ko`rinishi har qanday matematik kursda matematik tuzilmalarni o`rganish zarur degan xulosaga kelish imkonini beradi.

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TALABALARGA IKKINCHI TARTIBLI SIRTLARNI GRAFIKLAR ASOSIDA O'RGATISH USULLARI

Annotatsiya: *Ushbu maqolada talabalarga ikkinchi tartibli sirtlarni grafiklar asosida o'rgatish usullari keltirilgan.*
Kalit so'zlar: *Aylanma sirt, tenglama, koordinatalar sitemasi, to'plam.*

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TEACHING METHODS OF SECOND-ORDER SURFACES TO STUDENTS BASED ON GRAPHS

Abstract:*This article presents methods for teaching second-order surfaces to students using graphical representations. The approaches aim to enhance understanding through visual tools and coordinate systems.*
Keywords:*Quadratic surface, equation, coordinate system, set.*

1. Ikkinchi tartibli sirtning umumiy tenglamasi. Fazoning biror Dekart koordinatalar sistemasida a_{11}, a_{22}, a_{33}, a_{12}, a_{23}, a_{13} koeffisientlardan kamida biri noldan farqli bo'lgan

$$a_{11}x^2 + a_{22}y^2 + a_{33}z^2 + 2a_{12}xy + 2a_{23}yz + 2a_{13}xz + 2a_{14}x + 2a_{24}y + 2a_{34}z + a_{44} = 0 \quad (1)$$

tenglama bilan beriladigan nuqtalari to'plami ikkinchi tartibli sirt deyiladi.

Bizning asosiy maqsadimiz quyidagidan: agar nuqtalarning geometrik o'rni sifatida sirt berilgan bo'lsa, uning tenglamasini tuzish yoki aksincha, agar $Oxyz$ koordinatalar sistemasida tenglama berilgan bo'lsa, shu tenglama bilan tasvirlanadigan sirtning shaklini tekshirish kerak.

(1) tenglamaga ikkinchi tartibli sirtning *umumiy tenglamasi* deyiladi.

2. Aylanma sirtlar. Biror tekis L chiziqning l o'qi atrofida aylanishidan hosil bo'lgan nuqtalar to'plami *aylanma sirt* deyiladi. L chiziq aylanma sirtning meridiani, l o'qi esa, uning aylanish o'qi deyiladi. Shuni takidlab o'tamizki meridianning aylanish o'qi atrofida aylanishida uning har bir no'qtasi aylana chizadi.

Aylanish o'qi Oz o'qidan iborat bo'lgan L meridian esa Oyz tekislikda yotib,

$$\begin{cases} F(y,z) = 0 \\ x = 0 \end{cases} \quad (2)$$

tenglama bilan berilgan ќolni qarashdan boshlaymiz, S berilgan L chizišining Oz o'qi atrofida aylanishidan ќosil bo'lgan sirti va $M(x,y,z)\in S$ bo'lsin. M nuqta orqali Oz o'qqa perpendiko'lyar qilib o'tgazilgan Q tekislik S sirtning markazi Oz o'qqa yotuvchi K nuqtada bo'lgan aylana buyicha kesadi.

Aylana bilan L chiziqning kesishish nqtasini N bilan belgilaymiz. N nuqta $N(0,y_1,z)$ koordiniatarlari K nuqta esa $(0,0,z)$ koordinatariga ega. $|KM|=|KN|=|y_1|$. Ikki nuqta orasidagi masofani topish formulasiga ko'ra

$$d=|KM|=\sqrt{(x-0)^2+(y-0)^2+(z-z)^2}=\sqrt{x^2+y^2}$$

bo'ladi. Bundan $|y_1|=\sqrt{x^2+y^2}$ yoki $y_1=\pm\sqrt{x^2+y^2}$. Buni e'tiborga olsak, (2) tenglamasi quyidagi

$$F(\pm\sqrt{x^2+y^2},z)=0$$

(3)

ko'rinishga keladi. Shunday qilib, S aylanma sirtiga tegishli ixtiyoriy M nuqtaning koordinatalari (3) tenglamasi qanoatlantiradi. Ox va Oy o'qi atrofida aylantirishdan xosil bo'lgan aylanma sirtning tenglamasi mos ravishda

$$F(x,\pm\sqrt{y^2+z^2})=0 \text{ yoki } F(\pm\sqrt{x^2+z^2},y)=0$$

ko`rinishida bo'ladi.

Ellipsoid. Ellipsning simmetriyasi o'qi atrofida aylantirishdan xosil bo'lgan aylanma sirti *ellipsoid* deyiladi.Ushbu

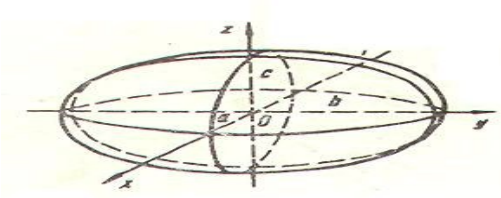
$$\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$$

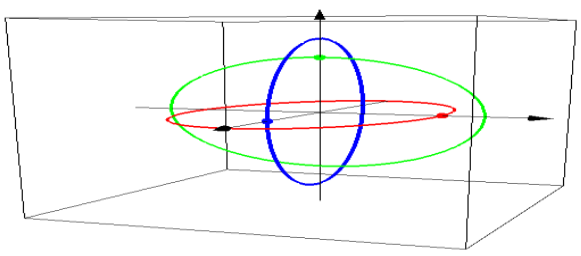
tenglamaga ellepsoidning kanonik tenglamasi deyiladi, bunda a,b,c musbat sonlar. Odatda a,b,c musbat sonlar ellepsoidning yarim o'qlari deyiladi.

Agar $a\neq b$, $b\neq c$, $a\neq c$ bo'lsa, u holda elipsoid uch o'qli elipsoid deyiladi.

Masalan. Oyz tenglamasida $\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$ tenglama bilan berilgan elipisning o'z o'q atrofida aylantirishdan xosil bo'lgan sirtning tenglamasi tuzing.

Yechilishi. Aylanma sirtning tenglamasini tuzish qoidasini foydalanib kuyidagiga ega bylamiz:





$$\frac{(\pm\sqrt{x^2+y^2})^2}{b^2}+\frac{z^2}{c^2}=1 \quad \text{yoki} \quad \frac{x^2}{b^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1 \qquad (4)$$

(4) tenlama bilan berilgan sirt *aylanma ellipsoid* deyiladi.

Agar $b>c$ bo'lsa, (4) tenglama qisilangan aylana ellepsoydani (2-chizma) , $b<c$ bo'lsa, chuzilgan aylana ellepsoydaning (3-chizma), $b=c$ bo'lganda esa tenglama $x^2+y^2+z^2=b^2$ ko'rinishini oladi va bu tenglama ma'lum bo'lgan sferani ifodalaydi. Umumiy xolda ellepsondning formasini tekshirish qulay. Buning uchun koordinata tekisliklari va koordinatalardan tekisliklarlariga paralel tekisliklar bilan jismlangan qarash lozim.

1). Ellepsondning $z=0$ tekislik bilan kesishish chizig'i ushbu tenglamalar sistemasi bilan beriladi.

$$\begin{cases}\frac{x^2}{y^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1\\ z=0\end{cases}$$

Bu chiziq yarim o'qlari a va b dan iborat bo'lib Oxy va Oxz tekisliklari simmetrik bo'lgan $A_1B_1A_2B_2$ ellipsdir (3-chizma)

2). Ellepssoidning $y=0$ tekislik bilan kesimning tenglamasi

$$\begin{cases}\frac{x^2}{a^2}+\frac{z^2}{c^2}=1\\ y=0\end{cases}$$

kurinishda bo'ladi.

3).Ellepsondning $x=0$ tekislik Bilan kisimning tenglamasi

$$\begin{cases}\frac{y^2}{b^2}+\frac{z^2}{c^2}=1\\ x=0\end{cases}$$

Bo'ladi.

4). Ellepsondning Oxy tenglamasi paralel $z=h$ tekislik bilan kesamiz. Bunda bizni qiziqtirayotgan kesim ushbu tenglamalar bilan beriladi.

$$\begin{cases}\frac{x^2}{a^2}+\frac{y^2}{b^2}=1+\frac{h^2}{c^2}\\ z=h\end{cases}$$

Bu yerda uchta xol bo'ish mumkin.

$a)$ agar $|h|<c$, bo¢lsa $1-\frac{h^2}{c^2}>0$ bo'lib, kesimda yarim ¢qlari $a_h=a\sqrt{\frac{h^2}{c^2}}$,

$b_h=b\sqrt{1-\frac{h^2}{c^2}}$ va markazi Oz o'qdagi $(0,\,0,\,h)$ nuqtada bo'lgan

$$\begin{cases}\frac{x^2}{a_k^2}+\frac{h^2}{c^2}=1\\ z=h\end{cases}$$

elleps xosil bo'ladi.

b) agar $h = c$ yoki $h = -c$ bo'lsa, u ќolda kesimda ellepsoidning c_1 va c_2 o'qlari ќosil bєladi.

c) agar $h < -c$ va $h > c$ bєlsa, u holda kesimlar mavxum ellepslar posil bo'ladi, ya'ni $z = h$ kislik ellepsoidning Bilan umumiy nuqtaga ega bulmaydi.

7) Elipisoidning tenglamasida x, y, z o'zgaruvchilari faqat juft darajada qatnashadi, bunda elipsoid kordinata boshiga nisbatan simmetrik bo'ladi. Kordiratalar boshi elipisoidning markazi deyiladi.

8) Elipisoidning o'zgarish soxasi $-a \le x \le a,\ -b \le y \le b,\ -c \le z \le c$ bєladi.

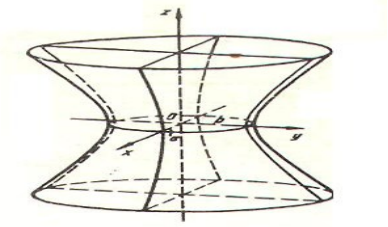
Gipgerboloidalr. Dastlab, giperboloidlar ikki xil bo'adi , ya'ni bir pallali gepirboloid va ikki palalli gepirboloid bo'lishini aytib o'tamiz.

1) Giperbolaning mavhum o'qi atirofida aylanishidan hosil bo'lgan sirt bir pallali aylanma giperboloid deyiladi (4-chizma).

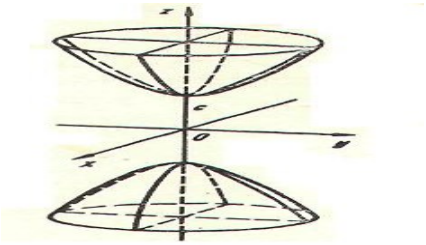
Ushbu

$$\frac{x^2}{a^2}+\frac{y^2}{b^2}-\frac{z^2}{c^2}=1,\ \frac{x^2}{a^2}-\frac{y^2}{b^2}+\frac{z^2}{c^2}=1,\ -\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1 \quad (*)$$

ko'rinishdagi tenglamaga birpallali gepirboloidning kononink tenglamasi deyiladi. Kordinatalar boshi bir pallali gepirboloidning markazi , (*) tenglama uchun a va b sonlar bir pallali gepirboloidning haqiyqiy yarim o'qi , c esa mavhum yarim o'qi deyiladi.



3-chizma.



4-chizma.

Bir pallali giperboloudning tekisliklar bilan kesimlarini qaraymiz:

1) Giperboloudning Oxy, Oxz, Oyz tekisliklar bilan kesak, kesimda

$\begin{cases}\frac{x^2}{a^2}+\frac{y^2}{b^2}=1\\ z=0\end{cases}$ -ellips; $\begin{cases}\frac{x^2}{a^2}-\frac{z^2}{c^2}=1\\ y=0\end{cases}$ - giperbola; $\begin{cases}\frac{y^2}{b^2}-\frac{z^2}{c^2}=1\\ x=0\end{cases}$ - giperbola.

2)Agar giperboloudni $0xy$ tekislikka paralel bo'lgan $z = h$ tekislik bilan kessak, rtsimda

$$\begin{cases} \dfrac{x^2}{a_h^2}+\dfrac{y^2}{b_h^2}=1 \\ z=h \end{cases}$$

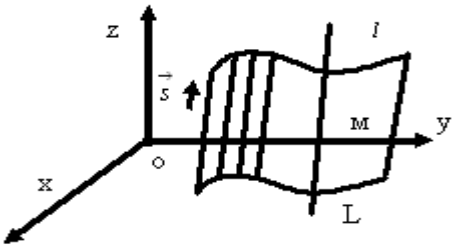
Ellips hosil bo'ladi, bunda $a_h=\dfrac{a}{c}\sqrt{c^2+h^2}$, $b_h=\dfrac{b}{c}\sqrt{c^2+h^2}$.

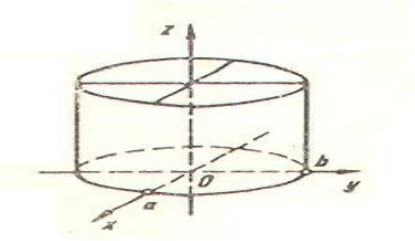
$h=0$ bo'lganda eng kichik yarim o'qli ellips hosil bo'ladi.

2). Giperbolani o'zining haqiqiy o'qi atrofida aylanishidan hosil bo'lgan sirt ikki pallali aylanma giperboloid deyiladi (4-chizma).

Ushbu $\dfrac{x^2}{a^2}-\dfrac{y^2}{b^2}-\dfrac{z^2}{c^2}=1$ ko'rinishdagi tenglama *ikki pallali giperboloidning* kanonik tenglamasi deyiladi.

Silindrik sirtlar. Berilgan $\vec{s}$ vektor yo'nalishiga parallyeligicha qolib, berilgan L chiziqni kesadigan to'g'ri chiziqlar to'plami *silindir sirt* deyiladi (5-chizma). Bunda L chiziq silindirlik sirtning yo'naltiruvchisi , $\vec{s}$ vektorga parallel l chiziqlar silindrik sirtining yasovchlari deyiladi.





5-chizma**.**

Yasovchilari Oz o'qlarida paralil bo'lgan silindirlik sirtni qaraylik. Bu sirtni sirtning yasovchisi l to'g'ri chmziqing tenglamasi $y=a(a>0)$ bo'lib u Oyz tekistlikda yotadi. Aylanma sirt tenglamasini etiborga olsak bu sirtning tenglamasi.

$$\pm\sqrt{x^2+y^2}=a \text{ yoki } x^2+y^2=a^2.$$

Bu sirtni to'g'ri doiraviy silindir deyiladi.

Ushbu

$$\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$$

tenglama fazoda silindirlik sirtni tasvirlaydi, uning yo'naltiruvchisi elipis bo'lib, u ellips Oxy tekistlikda yotgan yasovchisi esa Oz o'qqa paralel bo'ladi. Bunday sirt elliptik silindir deyladi(6-chizma).

Ushbu $\dfrac{x^2}{a^2}-\dfrac{y^2}{b^2}=1$ tenglama fazoda *gepirbolik silindrik* sirtni tasvirlaydi (7-chizma), uning yo'naltiruvchisi gepirbola bo'lib, u geperbola Oxy tekistlikda yotadi yasovchilari esa Oz o'qqa paralil bo'ladi.

Ushbu $y^2 = 2px$ tenglama paraboloik silindrik sirtni tasvirlaydi (8-chizma), uning yo'naltiro'vchisi parabola bo'lib, u parabola Oxy tekislikda yotadi, yasovchilari esa Oz o'qqa parallel bo'ladi.

4.Konus sirtlar. Fazoda biror qo'zg'almas $M_0(x_0, y_0, z_0)$ no'qtadan utib, berilgan L chiziqni kesuvchi l chiziqning harakatidan hosil bo'lgan sirt ***konus sirt*** deyiladi. $M_0(x_0, y_0, z_0)$ no'qta konus sirtining uchi, L chiziq uning yo'naltiruvchisi, l to'g'ri chiziq esa konus sirtining yasovchisi deyiladi.

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AYRIM ANTIBIOTIKLARNING OLINISH TARIXI VA ULARNING QO'LLANILISHI

Annotatsiya. *Antibiotiklarning noto'g'ri qo'llanishi natijasida yuzaga keladigan muammolarni yoritish va bu borada aholining xabardorligini oshirish. Antibiotiklardan noto'g'ri foydalanish natijasida mikroorganizmlarning ularga nisbatan chidamlilik (rezistentlik) hosil qilishi, nojo'ya ta'sirlar va sog'liq uchun xavfli oqibatlar yuzaga kelishi mumkin*

Kalit so'zlar: *Antibiotik, penitsillin, bakteritsid ta'sir, biosintetik penitsilinlar, streptomitsin, aminoglikozidlar, anafilaktik shok.*

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HISTORY OF OBTAINING SOME ANTIBIOTICS AND THEIR USE

Abstract. *Elucidation of the problems caused by the misuse of antibiotics and raising the awareness of the population in this regard. As a result of improper use of antibiotics, microorganisms can develop resistance to them, side effects and dangerous consequences for health may occur.*

Key words: *Antibiotic, penicillin, bactericidal action, biosynthetic penicillins, streptomycin, aminoglycosides, anaphylactic shock.*

Antibiotiklar – bakterial infektsiyalarni davolash uchun eng samarali dori vositalaridan biri hisoblanadi. Ular insoniyat tarixida ko'plab o'lim holatlarining oldini olishga va turli kasalliklarni davolashga yordam bergan. Biroq, so'nggi yillarda antibiotiklarning noto'g'ri qo'llanilishi global muammoga aylanib bormoqda. Noto'g'ri foydalanish natijasida bakteriyalar ushbu dorilarga chidamlilik

(rezistentlik) hosil qiladi, bu esa kelajakda oddiy infeksiyalarni davolashni qiyinlashtirishi mumkin.

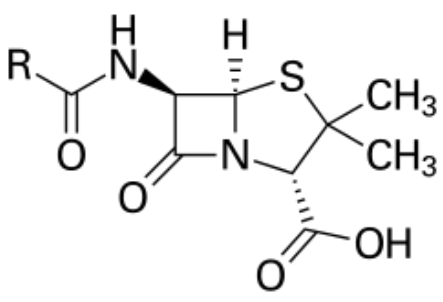
Antibiotiklarning kelib chiqish tarixi juda qiziqarli va muhim bo‘lib, tibbiyotdagi eng katta inqiloblardan biri hisoblanadi. Antibiotiklarning kashf qilinishi insoniyatning ko‘plab kasalliklar bilan kurashishda yangi imkoniyatlar ochdi.

Antibiotiklar haqidagi bilimlar 1928-yilda ingliz olimi Alexander Fleming tomonidan tasodifan kashf etildi. U o‘zining Staphylococcus aureus bakteriyasini o‘rganish jarayonida, ochiq idishda o‘sgan Penicillium nomli mog‘or mikroorganizmini bakteriyaga ta’sirini ko‘rdi. Bu mog‘or mikroorganizmi bakteriyalarni o‘ldirish xususiyatiga ega edi. Shunday qilib, Fleming penitsillin (Penicillin) deb nomlangan birinchi antibiotikni kashf etdi. 1940-yillarda Howard Florey, Ernst Boris Chain, va ularning hamkasblari bu antibiotikni ishlab chiqarishning sanoat miqyosida amalga oshiriladigan usullarini ishlab chiqdilar. Shu tarzda, ikkinchi jahon urushi davrida penitsillin ommaviy ravishda ishlab chiqarilib, jarohatlar va infeksion kasalliklar tufayli yuzaga kelgan o‘limlarni sezilarli darajada kamaytirdi.

Antibiotiklarni mikroblarga qarshi ta’sir mexanizmni bo’yicha tasnifi.

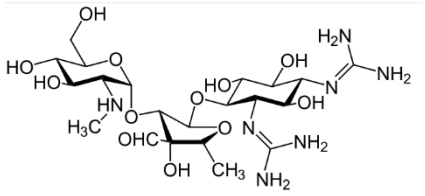
Mikroorganizmlar hujayra qobig’ini hosil bo’lishiga to’sqinlik qiluvchi antibiotiklar.	Sitoplazmatik membrananing o’tkazuvchanligini jarohatlovchi antibiotiklar	Oqsil va dnkni hosil bo’lishini to’xtatuvchi antibiotiklar
Benzilpenitsillin Oksatsillin Metitsillin Ampitsillin Sefalosporinlar Sikloserin Ristomitsin Vankomitsin	Polimiksinlar Gramitsinlar Nistatin Levorin	Streptomitsin Levomitsin Tetrasiklin Makrolit Neomitsin Gentamitsin Kanamitsin Novobiotsin Rifampitsin Linkomitsinsin

Penitsillin preparatlari ta’sirining asoratlari. Ularning terapevtk ta’sir doirasi katta bo’lgani sababli salbiy zaharli ta’siri kamroq uchraydi. Asoratlardan asosiylari allergik reaksiyalar bo’lib, taxminan 3-10% bemorlarda qayd etiladi.



Streptomitsin - Actinomyces globisporus streptomycin ning mahsulotidir. 1943- yilda Vaksman tomonidan olingan. Streptomitsin bakteritsid ta’sirga ega. Preparatning ta’siri asosan hujayra ribosomalaridagi oqsil sintezini to’xtatishi bilan bog’liq. Uning ta’sir spektri keng bo’lib,

asosan sil tayoqchasi, tularemiya, vabo, patogen kkoklar, grammusbat va grammanfiy bakteriyalarga qarshi samarali hisoblanadi.



Streptomitsin o’z davrida sil kasalligida samarali davo vositasi sanalgan. Shu bilan bir vaqtda undan nafas va peshob yo’llari yallig’lanishi kasalliklarini davolashda qo’llaniladi.

Preparatning nojo’ya ta’sirlaridan allergik holatlar (terida toshmalar, tana haroratining ortishi, anafilaktik shok) kuzatilishi ichki quloq bo’shlig’da to’planib, eshitish qobilyatini pasaytirishi mumkin. Dori eritmalari mahalliy og’riqqa sabab bo’ladi, uzoq muddat davomida qo’llash esa, unga nisbatan turg’un bo’lgan bakteriyalar oilasining paydo bo’lishiga sabab bo’ladi.

Aminoglikozidlarlarga neomitsin, gentomitsin va boshqa preparatlar kiradi. Ular kimyoviy tuzilishi bo’yicha streptomitsinga ko’p tomomdan o’xshash hisoblanadi.

Aminoglikozidlar tez ta'sir qiluvchi fungitsidlardir. Ular suspenzent bakteriyalarga kuchli bakteritsid ta'sir ko'rsatadi. Shuning uchun bu antibiotiklarga bakteritsid fungitsid deyiladi.

Antibiotiklarni ultratovush yordamida ishlab chiqarish hatto dori-darmonlarga chidamli bakteriyalarga nisbatan ham ularning samaradorligini oshirishi mumkin. Antibiotiklarga chidamli bakteriyalar shtammlarining ko'payishi hali ham hal qilinmagan muammo bo'lib, so'nggi o'n yilliklarda antibiotiklar bilan muvaffaqiyatli davolangan bakterial infektsiyalar butun dunyo bo'ylab. yana salomatlik tahdidi. Antibiotiklarning ultratovushli nano-strukturizatsiyasi tetratsiklin kabi antibiotiklarning doriga chidamli bakteriyalarga qarshi samaradorligini oshirishning istiqbolli usuli hisoblanadi.

Antibiotiklar insoniyatning bakterial infeksiyalarga qarshi kurashida muhim o‘rin egallaydi. Biroq ularning noto‘g‘ri qo‘llanishi — masalan, doza, davolanish muddati yoki tibbiy tavsiyalarsiz iste’mol qilinishi — mikroorganizmlarda chidamlilik (rezistentlik) rivojlanishiga olib kelmoqda. Bu esa sog‘liq uchun jiddiy xavf tug‘diradi va oddiy infeksiyalarni ham davolashni qiyinlashtiradi. Maqolada penitsillin va streptomitsin kabi antibiotiklarning kelib chiqishi, ta’sir mexanizmi, tasnifi va nojo‘ya ta’sirlari batafsil yoritilgan. Ayniqsa, aminoglikozidlar guruhining protein sintezini to‘xtatish orqali bakteritsid ta’sir ko‘rsatishi ta’kidlangan. Antibiotiklardan oqilona foydalanish, ularni faqat shifokor tavsiyasiga asosan qabul qilish va aholi o‘rtasida bu borada xabardorlikni oshirish infeksiyalarni samarali davolashda muhim ahamiyatga ega.

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ENSURING EFFECTIVE PERFORMANCE OF JOINT-STOCK COMPANIES THROUGH FINANCIAL MANAGEMENT

Abstract: This article analyzes the theoretical foundations and practical aspects of financial management in joint-stock companies, emphasizing its impact on operational efficiency and profitability. Using data from the State Committee of the Republic of Uzbekistan, the study examines trends in net profit and return on assets (ROA) from 2020 to 2024. The research is grounded in classical financial management theories such as Modigliani–Miller and agency theory. The findings highlight the critical role of optimized capital structure, effective liquidity management, and risk mitigation strategies in ensuring long-term stability and competitiveness. Moreover, the discussion explores the necessity of transparent financial reporting and the implementation of digital tools for real-time decision-making. The study concludes that adopting strategic financial practices significantly contributes to the sustainable development of joint-stock companies in emerging markets like Uzbekistan.

Keywords: Financial management, joint-stock companies, capital structure, profitability, ROA, agency theory, corporate governance, Uzbekistan

INTRODUCTION

In a market economy, joint-stock companies (JSCs) are recognized as vital corporate entities that contribute to economic growth and social stability. The success of their operations is closely linked to the effective management of financial resources. Financial management involves planning, controlling, and analyzing financial flows to maximize returns. It plays a central role in shaping investment policies, optimizing costs, and enhancing profitability. This paper explores the theoretical principles and practical implications of financial management in JSCs, focusing on trends and outcomes in Uzbekistan.

METHODS

This research employs a theoretical analysis methodology based on economic literature, international standards, and data from the State Committee of the Republic of Uzbekistan. Classical financial theories such as Modigliani–Miller and agency theory, along with corporate governance concepts, were applied. Graphical analysis was used to observe trends in net profit, asset efficiency, and dividend payments from 2020 to 2024.

RESULTS

Financial management plays a critical role in joint-stock companies by ensuring the following:

1. 1. Optimization of capital structure – balancing equity and debt to ensure financial stability.

2. 2. Maintaining liquidity and solvency – effective management of cash flows for short-term obligations.

3. 3. Increasing profitability – using investment decisions to enhance company value.

4. 4. Risk management – analyzing and mitigating market, currency, and interest rate risks.

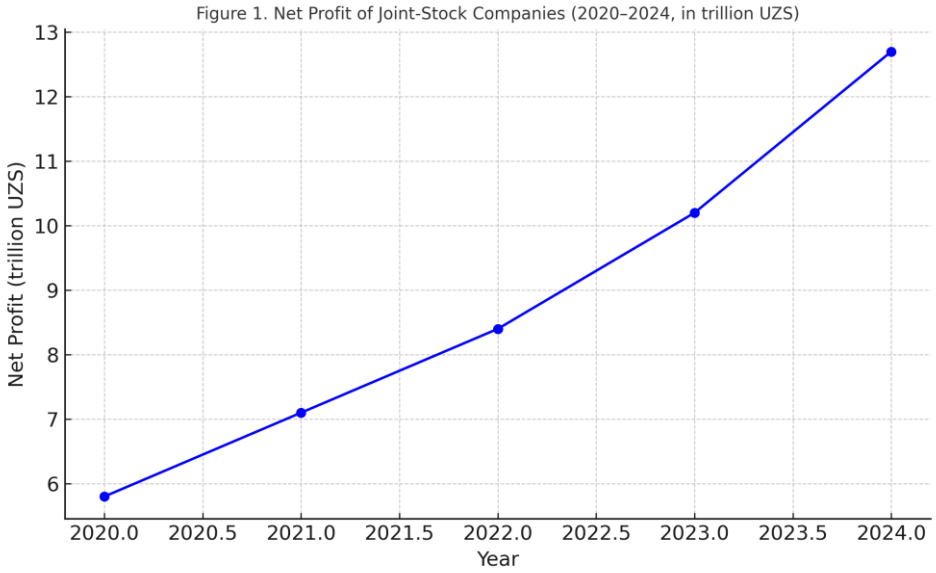

Figure 1. Net Profit of Joint-Stock Companies (2020–2024, in trillion UZS)

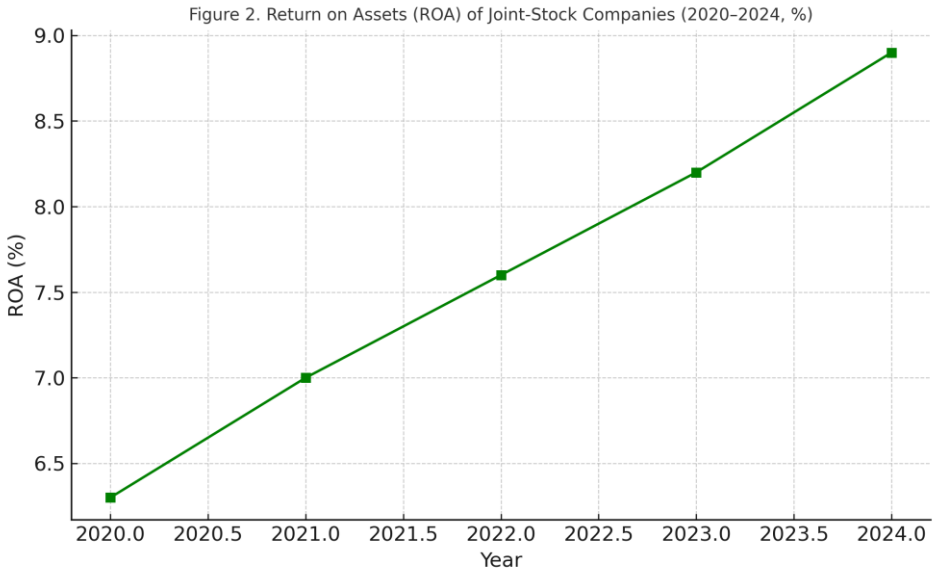

Figure 2. Return on Assets (ROA) of Joint-Stock Companies (2020–2024, %)

DISCUSSION

The results suggest that a strong financial management system enhances both internal stability and stakeholder confidence in JSCs. According to agency theory,

conflicts between managers and shareholders can reduce firm value. Mechanisms such as transparent reporting, performance-based incentives, and auditing systems help align interests. Strategic functions of financial management—investment analysis, dividend policy, and risk management—determine sustainable corporate growth. Digitalization supports automation and real-time analytics.

CONCLUSION

Efficient financial management in joint-stock companies positively impacts overall performance. A well-structured capital base, profitability, and robust risk management contribute to competitiveness and long-term development. Uzbekistan should enhance financial management systems by integrating international standards and adopting innovative technologies.

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ON THE CRITERIA FOR EVALUATING WATER RESERVOIRS FOR RECREATIONAL PURPOSES IN THE TERRITORY OF SYRDARYA REGION

Abstract: Recreation *(lat. recreatio (" recreation ") — healthy , but tired normal well-being of a person and labor activity restoration for the purpose done increaseable health-giving measures complex . On the shores of seas, lakes, rivers and artificial water bodies (ponds, quarries, reservoirs) recreational beach and swimming holidays are organized for these purposes . The assessment takes into account the conditions of access to the water, the presence of a beach line, the nature of the bottom, the speed of the current (river), the distribution of weak waves in large bodies of water, and the temperature regime. The swimming season is considered possible for a wide range of vacationers when the water temperature reaches +17°C.*

Keywords *: Recreation, basin, hydrography, water sports, water bodies, evaluation criteria, sanitation, hygiene.*

Introduction. Water bodies of interest for recreational activities include seas, large and small rivers, lakes, and artificial reservoirs - from large reservoirs built on rivers to ponds and quarries filled with water.

The recreational aspects of water bodies in the region are determined by the following characteristics:

❖ **hydrographic aspects** - area, length, depth of water bodies, hydrographic network density, etc.;

❖ **Types of water bodies** - rivers, lakes, reservoirs, streams, rivulets, waterfalls, waterfalls, canals, ditches, artificial water bodies (created for various purposes), ditches, etc.

Water bodies are assessed in an integrated manner based on one or more factors, areas and purposes, and their interrelationships. In some cases, they can also be assessed in terms of several factors selected separately. For example, depending on the nature of recreational activities, assessment factors are stratified and an integrated assessment is carried out. For example, water resources are used for beach and swimming, recreation (for medical and health purposes), various types of

water sports activities. When water resources are used for medical and health purposes, the chemical composition, temperature and pressure of the water are assessed from the point of view of comfort.

When using water resources for recreational purposes, the existing drinking water supply and suitability in the area should be considered and assessed first.

In addition, water bodies are evaluated for tourism purposes differently depending on their type. For example, in most cases, the coastal parts of large water bodies (lakes and reservoirs) are evaluated for tourism purposes and are carried out as follows:

Main criteria for evaluating water bodies for recreational purposes
Table 1

Parameter	Convenience level		
	comfortable	relatively comfortable	inconvenient
1	2	3	4
Coasts	Dry , terraced , steep smooth , natural under the circumstances development for suitable	Dry but steep edged , often peak , development to the water fall for simple structures demand does (if water near beach line if)	Coasts swamp or very steep , high cliff or ravine
To the water approach	Open field	cleaning need	Swamp , bush , closed
Beaches	Sandy , fine rocky	Grass – herbaceous , large rocky	Clay (mud), peat , rock
The coast shallowness : - adults for 0.5-1.5 m; - children for 0.5-1.2 m	20-100 m (at sea) 20-50 m (river) and on the lake)	From 100 m more than (at sea) From 20 less than 50 m more than (river and on the lake)	Sand shore no
Bottom sign	Sand and small stones	Big stones , mud sand , stones	water microorganisms with covered big plates
speed , m/s	from 0.3 less	0.3—0.5	from 0.5 more than
temperature , oC	18-24	16-17; 25-26	From 16 less than ; 26 more than
Sanitary and hygiene conditions	Clean , pollution sources no	Ease with pollution sources no is made , water himself himself/herself cleans	Pollution maximum permission done from concentration increases and pollution sources no to do possible it's not

In areas with water resources, the shallowness of water bodies is a necessary factor for recreational use, beach and swimming, and relaxation. The reason is that

most vacationers do not know how to swim. For this reason, it is recommended to walk along the shore in shallow waters, wading in the water. Shallow waters that extend over an excessively long distance also cause discomfort to vacationers. If the shallow waters exceed 100 m, vacationers will have to wade through shallow water for a very long distance to dive. This leads to a sharp decrease in the quality of vacation on the coast. In the rivers to swim organization in doing stream speed from 0.3 m/s optimal conditions if not exceeded is observed . Fast flowing rivers - from 0.5 m/s more - swimming for suitable not . Sea and large of lakes on the shores swimming for limiting factor of water rudeness is considered . Sea level 3 points if not , go swimming permission is given . The most good water basins swimming season during weak waves dominance to do water Swimming pools . for the most comfortable conditions from 18 to 24 ° C was water at temperature Water is observed . only if the temperature is below 16 ° C very hard people swimming possible . Very high water temperature - from 26 ° C high - also uncomfortable .

water bodies used for recreational purposes to be safe for health, they must meet certain **sanitary and hygienic requirements** . These requirements ensure that citizens are protected from various infectious and other health-threatening factors during their recreation.

Below water to the basins wearable main **sanitary and hygienic requirements** quoted :

- 1. Water quality according to requirements

*a) **Bacteriological indicators***

- 1 liter in the water intestine stick bacteria indeterminacy need .
- Intestine stick to the group related bacteria number hygienic out of the norm not exceed (usually ≤ 500 bacteria in 100 ml of water).

*b) **Chemical indicators***

- **Harmful substances (heavy metals , pesticides , nitrates , oil products)** out of the norm not to exceed .
- **pH** Level : between 6.5–8.5 to be need .
- **Smell and color in water** no to be necessary .

*c) **Physics indicators***

- Water clear (at least 1 meter) to the depth see possibility).
- Temperature bathing for safe (18–24°C is optimal).
- Hard particles , blurry and many peaks not to be .

- 2. Water basin location and status

- Basin **pollutant from sources (industry waste , sewage waters , farms)** far away located to be need .
- **Sanitation protection zone** separated to be necessary (near) around landfill , septic tank , sewage (not to be).
- **Ventilation and natural cleaning** opportunity good was in places to be to the goal according to .

- 3. Environment environment and infrastructure requirements

- **Bathing places marked** , security signs installation necessary .

• **Toilets** , **garbage dishes** , **showers** , **clothes replacement cabins** there is to be need .

• Water basin surroundings **clean , from plants , from waste cleaned** to be necessary .

◈ 4. Hygienic monitoring

• Water quality **regular control to be done** must (at least summer in season once a week).

• Local sanitation control organs by **certification** or to use **permit** to be taken need .

Based on the above information, the water resources of the Syrdarya region for recreational purposes can be assessed as follows:

1. Location and natural opportunities difference

Area / Watershed	**Type of use**	**Current status**
Syrdarya River	Water sports (limited)	Boating and fishing are possible, but there are dangerous currents
Shurazak collector zone	Holiday (informal)	Population bathe , but sanitation and security requirements answer does not give
South Mirzachul Canal	Sports or recreation it's not	Used as a technical channel
Artificial basins (Sardoba water warehouse)	Vacation (permitted)	In some permission vacation zones there is
Around Gulistan city recreational zones	Holiday (informal)	Bathing for open some places open , but complete control not done

2. OFFER AND SOLUTIONS :

Directions	**Offers**
Water sports for special regions	Syrdarya river or Idle water in the warehouse safe zones mark
Hygienic control	Vacation in places water samples checking stand need
Infrastructure	Bathing in the zones shower , toilet , umbrella , lifeguard tools organization to grow
Ecological protection	Boat and scooters movement restriction , waste control
Legal standards	Informal use control to do , unauthorized sports and to bathe restriction
Tourism develop	Certified water sports schools open , local entrepreneurs attraction to do

Summary : Syrdarya in the province water basins both in the direction (sports and recreation) is used , but informal , formal not included in the form of . They right to zones isolation , sanitation , safety and ecological to the requirements based territorial management model working exit necessary .

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TO STUDY THE PLASTICITY OF THE BASINS OF THE BRANCHES OF THE ARTERIES OF THE STOMACH AND DUODENUM IN AN EXPERIMENT

Resume: *This article describes the studied plasticity of the basins of the branches of the arteries of the stomach and duodenum in an experiment. To clarify this issue, we initially studied the branching basins of individual arteries of these organs on angiograms of 5 intact stomachs and 12 duodenum of a dog. Each main artery of these organs has its own branching zone, where blood flow is carried out mainly by this artery.*

Keywords: *experiment, dogs, gastric arteries, duodenum 12, angiogram, indigocarmine, great vessels.*

Introduction. In recent years, the issue of chemotherapy for malignant tumors, particularly those of the abdominal cavity, through regional infusion and perfusion has garnered significant attention from both clinicians and researchers [3,4]. The administration of medicinal substances into the artery supplying the affected area allows for a high concentration of the drug in the blood, which directly contacts the tumor cells or inflammatory focus. Currently, a large number of studies are dedicated to catheterizing major arteries of the head, trunk, and limbs for chemotherapy of tumors of various locations [1,2]. The development of regional infusion and perfusion techniques is closely linked to the study of vascular branching patterns and the possibility of isolating these vessels to prevent leakage of the perfusate. Such studies have been conducted for several organs [5]. However, research on the in vivo study of the branching zones of major arteries of the stomach and duodenum is scarce and contradictory.

Study Objective. We investigated the plasticity of the branching basins of the arteries of the stomach and duodenum in experimental settings.

Materials and Methods. To address this issue, we initially studied the branching basins of individual arteries of these organs using angiograms of five intact stomachs and duodenums from dogs. Subsequently, in experiments on 18 dogs, the branching zones of individual arteries of the stomach and duodenum were identified in vivo by separately injecting a 5% indigo carmine solution into the arteries. Data from acute and chronic experiments were compared with postmortem angiograms of the stomach and duodenum of five dogs under normal conditions.

Results. The branching basins of the major vessels of the stomach and duodenum were studied with other arteries and veins preserved, which naturally resisted the spread of the injected indigo carmine, thereby limiting its distribution

to natural boundaries. To identify the branching zones of the major arteries of the stomach in dogs, indigo carmine was injected into the left gastric artery in four dogs, the left gastroepiploic artery in four dogs, the right gastric artery in three dogs, and the right gastroepiploic artery in four dogs. The injection of a 5% indigo carmine solution into the cranial pancreaticoduodenal artery was performed in six dogs, the caudal pancreaticoduodenal artery in six dogs, and the second branch of the cranial mesenteric artery in six dogs. After the procedure, the dogs were kept alive. When injecting the indigo carmine solution into the left gastric artery, the solution stained the cardia area, partially the fundus, the lesser curvature, and the lesser omentum up to the pyloric region, as well as two-thirds of the anterior and posterior walls of the stomach. When injected into the right gastric artery, the solution primarily spread to the pyloric region of the stomach along its lesser curvature, including the anterior and posterior walls of the organ. The solution injected into the right gastroepiploic artery spread along the greater curvature of the stomach from the initial part of the duodenum to the transition of the stomach body to the pyloric region, covering the anterior and posterior walls of the organ and the right half of the greater omentum. Due to the small caliber of the short arteries supplying the fundus of the stomach, the indigo carmine solution was injected into the splenic artery. Before injection, the splenic artery was ligated at the hilum of the spleen. In this case, the indigo carmine solution spread to the fundus of the stomach, covering one-third of the anterior and posterior surfaces of the organ and the left half of the greater omentum, reaching the transition of the stomach body to the pyloric region. Thus, despite the presence of numerous intra-organ anastomoses between the terminal branches of the major arteries of the stomach, each major artery has its own branching zone where blood circulation is primarily maintained by that artery under normal conditions. The major arteries of the stomach, through multiple branching, form a network of "terminal" arteries in which blood does not significantly mix under normal conditions. Blood from each major artery of the stomach primarily flows into the corresponding branching zones of that artery. The lack of blood mixing in the branching zones of the major arteries of the stomach may be explained by the roughly equal pressure in the branches of these arteries under normal conditions. The areas of the vascular bed of the stomach wall with the highest number of anastomoses between the branching basins of the major arteries are typically referred to as zones of adjacent blood supply. These adjacent blood supply zones were stained with the indigo carmine solution in all cases, regardless of which artery the solution was injected into. Comparing the experimental data with postmortem angiograms of the stomach confirms the zonal nature of blood circulation in the stomach wall, which is due to the presence of multiple blood supply sources. The numerous arterial anastomoses between the terminal branches of the major arteries of the stomach create optimal conditions for rapid collateral blood flow from one artery to the preserved branching basins of other major arteries after their extra-organ segments are occluded. The results of in vivo injection of indigo carmine into the major arteries of the duodenum, compared with postmortem angiograms, show

that each artery of the duodenum has its own branching zone where it primarily maintains blood circulation under normal conditions.

Conclusion.1. Each major artery of the studied organs has its own branching zone where blood flow is primarily maintained by that artery.

2. Comparison of postmortem angiograms and in vivo arterial injections of the stomach and duodenum establishes that the primary arteries of the stomach, in terms of the extent of the occupied zone, are the left gastric and left gastroepiploic arteries, while for the duodenum, they are the cranial and caudal pancreaticoduodenal arteries. These findings may be of interest for performing regional infusion and perfusion of the stomach and duodenum.

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NOSTROIT YALLIG`LANISHGA QARSHI DORI VOSITALAR TA`SIRIDA JIGARINING MORFOMETRIK KO`RSATGICHLARI

Annotatsiya. *Jigar ovqat hazm qilish tizimining patologiyasi inson kasallanishi va o`lim holatlarining strukturasida yetakchi o`rinlardan birini egallaydi. Ovqat hazm qilish tizimining kasalliklari rivojlanishning buzilishi, parhezning buzilishi va ovqat hazm qilish jarayonining tarkibiy va funksional holatiga asoslangan.*

Jigar ovqat hazm qilish tizimi a'zolari, qon ivishi omillari va hazm bilan bog`liq bo`lmagan gormonlar ishlab chiqarishda, qondagi zaharli moddalarni organizmdan chiqarib tashlashda, kimyoviy dorilar natijasidagi o`zgarishlarni muvozanatini saqlashda, shuningdek, tananing immun javob reaksiyalarida ishtirok etadi.

Polipragmaziya - bir vaqtning o`zida, ko`pincha asossiz ko`plab yallig`lanishga qarshi va og`riq qoldiruvchi dori darmonlarni qo`llash.

***Kalit so`zlar:*** *jigar, o`t pufagi, parenxima, markaziy vena, o`t yo`llari, polipragmaziya.*

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MORPHOMETRIC PARAMETERS OF THE LIVER UNDER THE INFLUENCE OF NONSTEROIDAL ANTI-INFLAMMATORY DRUGS

Annotation. *Liver pathology of the digestive system occupies one of the leading places in the structure of human morbidity and mortality. Diseases of the digestive system are based on developmental disorders, nutritional disorders, and the structural and functional state of the digestive process. The liver is an organ of the digestive system, participates in the production of blood clotting factors and hormones not related to digestion, in the removal of toxic substances from the body, in maintaining the balance of changes caused by chemical drugs, and in the body's immune response.Polypharmacy - the simultaneous, often unjustified use of many anti-inflammatory and analgesic drugs.*

Keywords: *liver, gallbladder, parenchyma, central vein, bile ducts, polypharmacy.*

Kirish: Xozirgi davrda, kasalliklarni yaxshilashga qodir bo`lgan ko`plab dori-darmonlarni yaratish va amaliyotga joriy etish ishlarining shiddatli o`sishi kuzatilmoqda, bu bir tomondan bemorning ahvolini yaxshilashi, boshqa tomondan salomatlikka jiddiy zarar yetkazishi kuzatilmoqda [1]. Revmatik kasalliklar, tayanch-harakat tizimi bo`lmagan revmatik kasalliklar, yallig`lanish oqibatidagi nevrologik kasalliklar, og`riq sindromi va turli etiologiyali isitmalar, dismenoreya, arterial tromboz profilaktikasi va shunga o`xshash bir qancha kasalliklarda YAQD lardan foydalanish uchun ko`rsatmalar beriladi. Jigar parinxmasining zararlanishi nafaqat viruslar yoki gepatotsitlarga tabsir qiluvchi toksinlar, balki ko`plab dori vositalari bilan ham bog`liq bo`lishi mumkin [2]. Odatda, bu turdagi priparatlarga nisbatan yuqori sezuvchanlikka ega bo`lgan va insonning individual genetik xususiyatlariga bog`liq bo`lgan shaxslarda sodir bo`ladi [3]. O`tkir shikastlanish organ parenximasida gepatotsitlarga sitotoksik yoki sitolitik ta’sir tufayli, o`t suyuqligi chiqarish tizimining elementlarida (xolestatik shikastlanishlar) yoki kombinatsiyalangan bo`lishi mumkin. Turli ma’lumotlarga ko`ra, klinik jihatdan aniqlangan sariqlik holatlarining 6% dan ortig`i yallig`lanishga qarshi dori vositalariga qabul qilish bilan bog`liq [4]. Shu bilan birga, 12% hollarda etiologiyasi aniq bo`lmagan surunkali gepatit bilan og`rigan bemorlarni tekshirishda laboratoriya ko`rsatgichlari va o`zgarishi dori vositalariga qabul qilish bilan bog`liq bo`lishi mumkin

Tadqiqot maqsadi: Tajribada nostroit yallig`lanishga qarshi dori vositalar ta`sirida jigarining morfometrik va morfometrik ko`rsatgichlarini o`rganish.

Tadqiqot materiali va usullari: Ko`p qo`llanilgan nosteroid yallig`lanishga qarshi dori vositalari ta’sirida yetti oylik bo`lgan zotsiz erkak kalamush jigar to`qimalarining morfologik va morfometrik o`zgarishlarning xususiyatlarini aniqlash va baholashdan iborat bo`lgan. Jigar to`qimasining umumiy makropreparati va eksperimental yetti oylik oq zotsiz erkak kalamushlar jigar to`qimasining turli qismlaridan olingan gistologik materiallar xizmat qilgan.

Qo`yilgan vazifalarni amalga oshirish uchun eksperimental, morfologik, morfometrik va statistik tadqiqot usullaridan foydalanilgan.

Tadqiqot natijalari: Tadqiqotning beshinchi guruhidan maksadi etti oylik oq zotsiz erkak kalamushlarga10 kun moboynida metal zond orqali medasiga besh xildagi yani paratsetamol 15 mg/kg, aspirin 5 mg/kg, ibuprofen 6 mg/kg,deksametazon 0,1 mg/k gidroksixloroxin sul’fat 6,5 mg/kg 10 kun davomida eritma shakilda yuborildi

Beshinchi eksperiment guruhi etti oylik ok zotsiz erkak kalamushlarining vazni 192.1g dan 248.8 g gacha, o’rtacha 220.8g gacha bo’ldi. Kalamushlarning beshinchi eksperiment guruhi jigar massasi 5.95 g dan 7.85 g gacha, o’rtacha – 4.05± 0,12 g gacha. Etti oylik oq zotsiz erkak kalamushning jigar uzunligi beshinchi eksperiment guruhda 2,5 dan 3,2 sm, o’rtacha uzunligi 2,85±0,08sm ni tashkil etadi.

Etti oylik oq zotsiz erkak kalamush jigarining yuqori va pastki qirg’oqlar orasidagi masofa 1,84-2,1sm o’rtacha 1,9±0,061sm tashkil qiladi. Etti oylik ok zotsiz erkak kalamushning jigarining kalinligi 2,6-3,3sm o’rtachasi 2,95±0,91sm ga teng.

Gepatotsitlarning ko’ndalang o’lchami 19,0 dan 25,0 mkm gacha, o’rtacha - 22,0 ± 0,68 mkm gacha o’zgaradi. Ular aniq chegaralar bilan ko’pburchak shaklga ega. Gepatotsitlar sitoplazmasining o’rtacha ko’ndalang maydonning ko’rsatkichlari 450,0 mkm dan 680,0 mkm gacha, o’rtacha - 565± 17,51 mkm gacha bo’ladi. 100 ta gepatotsitlarga binuklear gepatotsitlarning soni 9-17 oralig’ida bo’lib, o’rtacha 13,1 ± 0,4 ga teng. Kalamushlarning nazorat guruhi gepatotsit yadrolarining ko’ndalang kesimi ko’rsatkichlari 76 mkm dan 102 mkm gacha, o’rtacha – 89,0±2.7 mkm gacha.

Jigar bo’laklarining markazida jigar tomirlarining dastlabki aloqasi bo’lgan markaziy tomirlar mavjud. Markaziy venalarning diametri 39,0 dan 61,0 mkm gacha, o’rtacha-50.0± 1,55 mkm gacha. Portal traktlari arteriya, vena va o’t yo’lini o’z ichiga olgan bo’laklar atrofida joylashgan.

Bo’laklararo venalar diametri 18,0 dan 29,0 mkm gacha, o’rtacha-23.5± 0,72 mkm gacha. Bo’laklararo arteriyalarning diametri 9 dan 16 mkm gacha, o’rtacha 12.5 ±0,38 mkm gacha bo’ladi. Sinusoidal kapillyarlar asosan radial yo’nalishda bo’laklarning markaziga yo’naltiriladi, ular markaziy tomirlarga oqib o’tadi. Bu gemokapillyarlar ko’ndalang kesimda 8,7 dan 12,0 mkm gacha kattalikka ega, o’rtacha - 10,35±0,32 mkm gacha. Gepatotsitning bir tomoni sinusoidga (sinusoid tomonga), boshqa tomoni esa safro kapillyarlari (safro tomonga) hosil bo’lgan qo’shni gepatotsitga duch keladi.

Xulosa: Tadqiqotning beshinchi bosqichida besh turdagi dorilardan foydalanilganda shu guruhga mansub etti oylik oq zotsiz erkak kalamush jigari morfologik (gistologik) ko’rinishi o’rganilganda, jigar to’qimasi, markaziy venada notekis to’laqonlik, sentrolobulyar gepatotsitlarda monotsellyulyar nekroz (39.8%, n=5), gepatotsitlarda sust shakllangan tomchili yog’li distrofiya o’choqlari (31.2%, n=4) aniqlandi. Olingan natijalardan ko’rinib turibdiki, oq zotsiz kalamushlar jigaridagi salbiy morfologik o’zgarishlar uchrash intensivligi 5-guruhda 4-guruhga nisbatan ko’p bo’ldi. Beshinchi guruhga mansub etti oylik oq zotsiz erkak kalamushlar jigari morfologik xususiyatlaridan quyidagi o’zgarishlar uchrash intensivligi ko’payganini ko’rsatish mumkin: gepatotsitlar guruhi lizisga uchragan, sinusoidal bo’shliqlar to’laqonligi (68,0%, n=9), aksariyat gepatotsitlar yadrosi giperxromli (68,0%, n=9), shuningdek, sinusoidal bo’shliqlar gepatotsitlar atrofida bir xil kenglikda (53.5%, n=7) bo’lib, gepatotsitlarda nekrozga uchragan sohada sinusoidal bo’shliqlar kengayishi va to’laqonli bo’lishi (48.5%, n=5) kuzatilgan.

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LANDSHAFTLARDA IQLIM RESURSLARIDAN FOYDALANISHNING GEOGRAFIK ASOSLARI

Annotatsiya: *Maqolada Qashqadaryo havzasi tekislik agroiqlim rayonlari guruhi va agroiqlim elementlarining miqdoriy ko'rsatkichlarining joyning geografik o`rni va relyefiga bog`liq holda meteorologik elementlarning bir-biridan farq qilishining geografik asoslariga e'tibor qaratilgan. Qashqadaryo havzasining tekislik qismini uchta yani Quyi Qashqadaryo, G'uzor va Shahrisabz agroiqlimiy rayonlarga ajratilishi haqida bayon etillgan.*

Kalit so'zlar: *agroiqlim, relyef, harorat, atmosfera bosimi, havoning namligi, bug'lanish, yog`in, zonallik, arid, gumid, ekstragumid.*

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GEOGRAPHICAL FOUNDATIONS OF THE USE OF CLIMATIC RESOURCES IN LANDSCAPES

Abstract: *The article focuses on the geographical justification of how the group of lowland agro-climatic regions of the Kashkadarya basin and the quantitative indicators of agro-climatic elements differ from each other in meteorological elements depending on the geographical location and terrain. The division of the lowland part of the Kashkadarya basin into three agro-climatic regions is described: Nizhny Kashkadarya, Guzar and Shakhrisabz.*

Key words: *agroclimate, relief, temperature, atmospheric pressure, humidity, evaporation, precipitation, zonality, arid, humid, semigumid*

Kirish. Mamlakatimizda iqtisodiyotning muhim tarmoqlari orasida qishloq xo'jaligi alohida o'rin tutadi. Qishloq xo'jaligini hududiy jihatdan ixtisoslashtirish, oqilona joylashtirish va uni yanada rivojlantirish muammolarini o'rganish ham iqtisodiy, ham ijtimoiy ahamiyatga egadir. Hozirgi zamon talabidan kelib chiqqan

holda iqlimning global o‘zgarishi, kompyuter va GIS-texnologiyasining rivojlanishi O‘zbekiston hududini agroiqlimiy rayonlashtirishda katta ahamiyatga molik masaladir. Landshaftshunoslikning amaliy jihatlaridan biri, asosan, qishloq xo‘jaligini rivojlantirish talablaridan kelib chiqqan holda landshaftlarni ta’riflovchi turli ma’lumotlar bilan ta’minlab turish zarurdir. Shunday ma’lumotlarga, masalan, landshaft xaritalari, tabiiy geografik rayonlashtirish natijalari qatorida landshaftlarning iqlimining o`ziga xos jihatlari batafsil ta’rifi beriladi. Landshaftlarga taalluqli ma’lumotlarni qishloq xo‘jaligi maqsadlarida baholash arid iqlimli hududlarda ayniqsa dolzarbdir.

Kirish. Amaliy landshaftshunoslikda boshqa tarmoqlar kabi qishloq xo‘jaligining turli xil amaliy masalalarini hal etishda landshaft haqidagi ta’limotning nazariy tamoyillari va usullaridan foydalanish va tatbiq etish muhim ahamiyat kasb etadi. Landshaftlarni ma`lum bir maqsad uchun baholashning asosiy mazmuni kishilik jamiyatining talablaridan kelib chiqqan holda, landshaftlarning qulay yoki noqulayligi darajasini aniqlab berishdan iboratdir.

Qishloq xo‘jaligi nuqtai-nazaridan iqlimning eng asosiy elementlari hisoblangan havo harorati, yog‘in-sochin miqdori va shamollar eng muhim ahamiyat kasb etadi. Havo harorati haftalik, oylik va yillik guruhlardan tashkil topgan. Qishloq xo‘jaligida mutlaq sovuq va issiq harorat, bahor oylarida tushadigan eng oxirgi sovuq, kuz faslida tushadigan eng birinchi sovuq ham katta o‘rin tutgani uchun albatta hisobga olinadi. Iqlim resurslari ayniqsa qishloq xo‘jaligini rivojlantirish sharoitlarini belgilovchi asosiy tabiiy resurslardan biridir. Shu sababli iqlimning bevosita qishloq xo‘jaligida foydalaniladigan elementlari (radiatsiya, issiqlik va namlik) agroiqlim resurslarini hosil qiladi.

Qashqadaryo havzasi tekislik, hamda tog‘li hududlar doirasida joylashgan. Hududda O‘rta Osiyoning agroiqlimiy rayonlashtirish tuzilmasida tekislik agroiqlim rayonlari guruhi va tog‘lik agroiqlimiy rayonlari guruhi alohida-alohida ajratiladi. Buning sababi negizida tekisliklarda namlik va issiqlikning hududiy o‘zgarish omili, tog‘larda esa iqlim elementlarining balandlik zonallik qonuniyati asosida tarqalish yotadi. O‘rta Osiyo agroiqlimshunoslik ilmining asoschilaridan biri L.N. Babushkin Qashqadaryo havzasining tekislik qismini uchta yani Quyi Qashqadaryo, G‘uzor va Shahrisabz agroiqlimiy rayonlariga ajratadi [1; – 160 c.].

Shunday ekan, bu ajratilgan agroiqlim rayonlarida meteorologik elementlarning muayyan ko‘rsatkichlarida namoyon bo‘lish shart- sharoitlari bir-biriga o‘xshamaydi. Garchi bu uchta agroiqlim rayonlari bir xil tekislik relyefining ustunligiga ega bo‘lsada harorat va namlikning o‘zaro nisbatini shakllantiradigan joyning geografik kengligi, dengiz sathidan balandligi, havo oqimlari yo‘lida joylashganligi va boshqa iqlimiy omillar tasir ko‘rsatishi jihatdan bir-biridan farq qiladi. Darhaqiqat, o‘simlik va hayvonot hayoti uchun zarur bo‘lgan yorug‘lik, issiqlik va namlik kabi birinchi darajali omillarga shamol, bulutlilik, atmosfera namligi, qurg‘oqchilik kabi ikkinchi darajali omillar tasir ko‘rsatadi.

O‘simlik va hayvonlarning rivojlanishi, ular mavjud bo‘lgan muhitning haroratiga bevosita bog‘liq bo‘ladi. Organizmning rivojlanishi boshlanadigan eng past harorat (shu haroratdan past bo‘lsa rivojlanmaydi) biologik nol deb ataladi.

Rivojlanish boshlangan harorat ko‘rsatkichidan to rivojlanishning yuqori darajasiga, organizmning o‘ziga berilgan barcha funksiyalarini-(unib chiqish, gullash, o‘sish, urug‘ yetilishi) bajarish uchun zarur bo‘lgan harorat yig‘indisi samarali haroratlar deyiladi. Odatda ko‘pchilik organizmlarning, masalan, yovvoyi o‘tlarning rivojlanishi +5 daraja haroratdan boshlanadi. Organizmlar o‘ziga berilgan biror funksiyasini bajarishi (masalan, daraxt mevasining pishib yetilishi) uchun harorat yig‘indisi necha kunda to‘planishi quyidagi formula orqali hisoblab topiladi.

P=E/T- t

Bunda **P**-kunlar soni, **E**-harorat summasi, **T**-mazkur organizm rivojlanish davrining doimiy harorati, t - rivojlanishning eng past harorati. Boshqacha aytganda, doimiy haroratni ayirib, zarur harorat yig‘indisi ayirmaga bo‘linib, necha kunda bu o‘simlik yetilishi aniqlanadi. Uni tabiiy namlanishi bilan bog‘lanadi. Tushadigan yog‘in miqdori o‘simliklarning o‘sishi uchun ularning ildizlari orqali qabul qilishidan tashqari yer ustidan bug‘lanishga ham sarflanadi. Organizmlar rivojlanishi uchun hududning tabiiy namlanish yani o‘simliklarning namlik bilan taminlanishi sohasida V. Kyoppen, YE.Martonn, R. Lant S.S. Neustruyev va boshqa mashhur geograf olimlar tadqiqot olib borib, “yog‘in omili” ekologik tushunchasi ko‘rsatkichini ishlab chiqqanlar [1; – 160 c.].

G.T. Selyaninov 1930 yillarda gidrotermik koyeffitsent (namlik –issiqlik nisbati samarasi) ko‘rsatkich tushunchasini ishlab chiqdi. Yovvoyi va madaniy o‘simliklar asosan sutkalik harorat +10 darajadan yuqori bo‘lganda jadal rivojlanishini hisobga olib, shu ko‘rsatkich eng past harorat sifatida qabul qilingan. +10 darajadan yuqori harorat bilan taminlangan yilning issiq oylaridagi yog‘in miqdorining shu oylardagi harorat yig‘indisini o‘n baravarga kamaytirgan holdagi nisbatini gidrotermik koyeffitsenti deb atagan. Agar gidrotermik koyeffitsent birdan kam bo‘lsa, vegetatsiya davrida nam yetishmasligi, qurg‘oqchilik (arid) sharoit, birdan ikkigacha namlik yetarli (gumid), ikkidan yuqori bo‘lsa namlanish (ekstragumid) ortiqcha bo‘lgan muhit ro‘y beradi. Gidrotermik ko‘rsatkich muhim agroiqlim ekologik omil bo‘lganligidan, bu sohada rus olimlari A. L. Shatskiy, N.N.Ivanov va boshqa tadqiqotchilar ham sug‘orma dehqonchilik hududlari misolida tadqiqot olib borganlar. Shuni aytish lozimki, jazirama issiq bo‘ladigan O‘zbekistonning tekislik qismida ob-havo rejimi hamma vaqt ham o‘simliklar uchun yetakchi omil bo‘lavermasligi mumkin, chunki ko‘pincha yovvoyi o‘simliklar bu davrda o‘z vegetatsiyasini nihoyasiga yetkazadilar [1; – 160 c. 3; 46-51 b.].

Tekislik rayonlari Qashqadaryo havzasining mutlaq balandligi 280 m dan 500 m gacha bo‘lgan g‘arbiy qismini o‘z ichiga oladi. Tekisliklar uchun cho‘l landshaftlarini tarkib topishiga imkon beradigan juda issiq iqlim sharoitlari xos. Issiqlik sharoitlariga ko‘ra a) juda issiq (faol haroratlar jami 5000^0 dan ziyod) va b) mo‘tadil issiq (4500^0–5000^0) zonalarga mansub yanvarning o‘rtacha harorati tekislikning katta qismida 0^0 dan yuqori, faqat Qarshi shahri va uning atrofida $-2,0^0$, mutlaq minimum (o‘rtachasi) -25 -29^0 gacha pasayadi. Haroratlarning mutlaq maksimumi 47–49^0, yillik yog‘inlarning miqdori 150–200 mm. Iqlim

sharoitlarining ichki tafovvutlariga ko‘ra tekisliklarda: 1) Sandiqli va 2) Qarshi agroiqlim rayonlari ajratiladi [2; 132-136 b. 4; 88-92 b].

Masalan, Nishon tumanida sug‘orma dehqonchilik qilinadigan maydonlar dengiz sathidan 280-450 metr balandlikda joylashganligi sababli juda issiq va quruq gidrometrik zonaga kiradigan, termik resurslar 5300-4900^0 GTK 0,5 dan kichik bo‘ladi. Bunday agroiqlim sharoiti paxtaning kechpishar, ingichka tolali navlarini yetishtirish uchun juda qulaydir [4; 88-92 b.].

Yuqoridagilarni tahlil qilgan holda, quyidagi xulosaga keldik. Qashqadaryo havzasining tekislik qismi sug‘orma dehqonchilikning eng qulay tarmoqlarini kengaytirish imkonini beradi. Paxta bilan bir qatorda donchilik, bog‘dorchilik, uzumchilik, polizchilik, yem-xashak ekinlari va sug‘orma agroiqlim resurslari mavjudligi bilan tariflanadi. Demak, landshaftlarni rejalashtirishda har bir landshaftning o‘ziga xos tabiiy muhitni faqat o‘rganibgina yoki baholabgina qolmasdan, balki tabiiy muhitni yaxshilash, samaradorligini oshirish, tabiiy resurslardan to‘g‘ri va oqilona foydalanishning ilmiy-nazariy asoslarini ishlab chiqishda faol ishtirok etishni ta`minlash zarur.

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INTERNET TARMOG'IDA VOYAGA YETMAGANLAR TOMONIDAN SODIR ETILADIGAN HUQUQBUZARLIKLARNING OLDINI OLISH

Annotatsiya*: Ushbu maqolada Internet tarmog'ida voyaga yetmaganlar tomonidan sodir etiladigan huquqbuzarliklar va ularning oldini olish choralari muhokama qilinadi. Maqolada O'zbekiston Respublikasining qonun hujjatlari, psixologik va pedagogik usullar, shuningdek, ota-onalar va ta'lim muassasalari hamkorligi asosida bolalar huquqlarini himoya qilish yo'llari yoritilgan. Tadqiqotda statistik ma'lumotlar, ekspert fikrlari va amaliy tavsiyalar keltirilgan.*

Kalit so'zlar: *Internet, voyaga yetmaganlar, huquqbuzarliklar, kiberjinoyat, himoya choralari, psixologik ta'sir, qonuniy tartibga solish.*

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PREVENTION OF CRIMES COMMITTED BY MINORS ON THE INTERNET

Annotation: *This article discusses offenses committed by minors on the Internet and the measures to prevent them. It highlights ways to protect children's rights based on the legislation of the Republic of Uzbekistan, psychological and pedagogical approaches, as well as cooperation between parents and educational institutions. The study includes statistical data, expert opinions, and practical recommendations.*

Keywords: *Internet, minors, offenses, cybercrime, protective measures, psychological impact, legal regulation.*

Kirish

Zamonaviy axborot texnologiyalari rivojlanishi bilan Internet bolalar va o'smirlar hayotining ajralmas qismiga aylandi. Biroq, virtual muhitda voyaga yetmaganlar nafaqat qurbon, balki huquqbuzarliklar sub'ekti ham bo'lishi mumkin. O'zbekistonda ham har yili kiberjinoyatlar, shaxsiy ma'lumotlarni suiiste'mol qilish, nafratli kontent tarqatish kabi holatlar kuzatilmoqda. Bu muammolarga qarshi kurashishda qonuniy, pedagogik va texnik choralar muhim ahamiyatga ega.

Metodologiya

Maqolada quyidagi usullar qo'llanildi:

1. **Normativ-huquqiy tahlil** – O'zbekiston qonunlarida bolalar huquqlarini himoya qilishga oid hujjatlar o'rganildi.

2. **Sotsiologik so‘rov** – o‘smirlar orasida Internetda huquqbuzarlik holatlari haqida ma’lumotlar to‘plandi.

3. **Ekspert baholari** – psixologlar, pedagoglar va huquqshunoslarning fikrlari tahlil qilindi.

4. **Statistik ma’lumotlar** – rasmiy hisobotlar va tadqiqotlar asosida Internet jinoyatchiligi dinamikasi ko‘rib chiqildi.

Tahlil va natijalar

Internet tarmog‘ida voyaga yetmaganlar tomonidan sodir etiladigan huquqbuzarliklar tobora ko‘payib bormoqda. Bu holat nafaqat O‘zbekistonda, balki butun dunyoda keng tarqalgan muammo hisoblanadi. O‘smirlarning virtual muhitda qiladigan noqonuniy harakatlari ularning kelajak hayotiga jiddiy ta’sir ko‘rsatishi mumkin. Shu sababli, bu borada chuqur tahlil qilish va samarali choralarni ishlab chiqish zarur.

Voyaga yetmaganlarning Internetdagi huquqbuzarliklari turlari

Voyaga yetmaganlar tomonidan Internetda sodir etiladigan huquqbuzarliklar turlari juda xilma-xildir. Ular orasida eng ko‘p uchraydiganlar quyidagilardir:

Kiberqasddanlik (kiberbullying) – bu boshqa foydalanuvchilarga nisbatan psixologik bosim o‘tkazish, ularni haqorat qilish, tahdid qilish yoki ularni ijtimoiy tarmoqlarda xijolat qilishdan iborat. Masalan, ba’zi o‘smirlar sinfdoshlarining shaxsiy fotosuratlarini izohlar bilan tuhmat qilishadi yoki ularga nisbatan qo‘rqitish usullarini qo‘llashadi.

Shaxsiy ma’lumotlarni noqonuniy tarqatish – bu ko‘pincha o‘smirlar tomonidan boshqalarning maxfiy yozishmalari, fotosuratlari yoki videolarini ruxsatsiz tarqatish shaklida namoyon bo‘ladi. Ba’zi hollarda, bu harakatlar jinsiy zo‘ravonlik (sexting) shaklida ham sodir bo‘lishi mumkin.

Hakerlik harakatlari – ba’zi o‘smirlar dasturlash bilimlaridan foydalanib, veb-saytlarga kirishni bloklash, ma’lumotlarni o‘g‘irlash yoki tizimlarni buzish kabi noqonuniy amallarni sodir etishadi.

Huquqbuzarliklarning asosiy sabablari

Voyaga yetmaganlarning Internetda huquqbuzarliklar sodir etishiga turli omillar ta’sir ko‘rsatadi.

Psixologik omillar – o‘smirlik davri inson hayotidagi eng nozik davr hisoblanadi. Bu davrda yoshlar o‘zlarini tasdiqlash, e’tibor qozonish va ijtimoiy guruhga moslashishga intilishadi. Shu sababli, ba’zilar buni noto‘g‘ri yo‘llar bilan amalga oshirishga harakat qilishadi.

Qonuniy bilim yetishmovchiligi – ko‘pchilik o‘smirlar Internetda qilgan harakatlarining jiddiy oqibatlari borligini bilmaydilar. Ular faqat "o‘yin" sifatida qaraydilar, ammo ularning ba’zi harakatlari jinoiy javobgarlikka tortilishi mumkin.

Huquqbuzarliklarning oqibatlari

Voyaga yetmaganlar tomonidan sodir etilgan huquqbuzarliklar nafaqat ularning o‘zlari, balki qurbonlar va butun jamiyat uchun ham jiddiy oqibatlarga olib kelishi mumkin.

Jinoiy javobgarlik – O‘zbekiston qonunchiligiga ko‘ra, 16 yoshdan katta bo‘lgan shaxslar ayrim jinoyatlar uchun javobgarlikka tortilishi mumkin. Agar

voyaga yetmagan shaxs noqonuniy harakatlar sodir etsa, uning ota-onalari ma’muriy javobgarlikka tortilishi mumkin.

Psixologik ta’sir – kiberbullyingga uchragan bolalar depressiya, tashvish va hatto o‘z joniga qasd qilish kabi jiddiy psixologik muammolarga duch kelishi mumkin.

Ijtimoiy munosabatlarning buzilishi – Internetda huquqbuzarlik qilgan o‘smirlar keyinchalik o‘zlarini ijtimoiy izolyatsiyaga olib kelishi mumkin.

Oldini olishning samarali usullari

Voyaga yetmaganlarning Internetdagi huquqbuzarliklarini kamaytirish uchun quyidagi choralarni qo‘llash kerak:

Qonuniy choralar – O‘zbekistonda bolalar huquqlarini himoya qilish bo‘yicha qonunlar mavjud bo‘lsa-da, ularni amalda qo‘llashni yanada mustahkamlash kerak.

Pedagogik choralar – maktablarda Internet xavfsizligi bo‘yicha maxsus darslar o‘tkazish, o‘smirlarga virtual muhitda qanday xulq-atvor qilish kerakligini o‘rgatish kerak.

Texnik choralar – ota-onalar bolalarning Internet faoliyatini nazorat qilish uchun maxsus dasturlardan (parental control) foydalanishlari kerak.

Ijtimoiy tarmoqlarda monitoring – davlat organlari va nodavlat tashkilotlar tomonidan Internet kontentini filtrlash va nafratli kontentga qarshi kurashish kerak.

Statistik ma’lumotlar va tadqiqotlar

2023-yilgi ma’lumotlarga ko‘ra, O‘zbekistonda 15% o‘smirlar hech bo‘lmaganda bir marta kiberbullyingda qatnashgan. Shu bilan birga, 30% ota-onalar bolalarning Internet faoliyatini nazorat qilish uchun hech qanday choralarni ko‘rmaydilar.

Muhokama

Internet huquqbuzarliklarining oldini olishda davlat, oila va ta’lim muassasalari hamkorligi zarur. O‘zbekistonda hozirgi kunda kiberjinoyatga qarshi choralar etarli emas, shu sababli qonuniy islohotlar va jamoatchilikning xabardorligini oshirish kerak.

Xulosa

Voyaga yetmaganlarning Internetdagi huquqbuzarliklarini kamaytirish uchun qonuniy, pedagogik va texnik usullarni qo‘llash lozim. Ota-onalar, maktablar va davlat organlari samarali hamkorlik qilganda, bolalar xavfsiz virtual muhitda faoliyat yuritishi mumkin.

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STEREOMETRIYA KURSIDA VEKTORLAR MAVZUSINI O‘QITISHNING ILMIY – NAZARIY ASOSLARI. VEKTORNING KELIB CHIQISH TARIXI

Annotatsiya: *Zamonaviy matematikaning asosiy (fundamental) tushunchalaridan biri bu vektor va tenzor tushunchalaridir. Matematika, mexanika, texnikaning turli jabhalarida vektorning keng ishlatilishi natijasida vektor tushunchasi evolutsion rivojlandi.*

Kalit so’zlar: *Aniq fanlar yo‘nalishidagi guruh(sinf)larda stereometrik masalalarni vektorlar usulida yechishga o‘rgatishning maqsad vazifalari, mazmuni, o‘qitish usullari, vositalari va shakllari.*

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SCIENTIFIC AND THEORETICAL FOUNDATIONS OF TEACHING THE TOPIC OF VECTORS IN THE COURSE OF STEREOMETRY. HISTORY OF THE EMERGENCE OF THE VECTOR

Annotation. *One of the fundamental concepts of modern mathematics is the concept of a vector and a tensor. As a result of the widespread use of vectors in various fields of mathematics, mechanics and engineering, the concept of a vector was formed.*

Keywords: *Objectives, content, teaching methods, means and forms of teaching the solution of stereometric problems using vectors in groups (classes) of the exact sciences.*

Kirish

Vektor-yangi matematik tushuncha. “Vektor” terminini birinchi bo‘lib 1845-yilda irland matemetigi va astronimi Uilyam Gamilton (1805-1865) kompleks sonlar haqidagi risolalarida qo‘llagan[8]. Xuddi shuningdek, “skalyar”, “skalyar ko‘paytma”, “vektor ko‘paytma” kabi tushunchalarni ham birinchi bo‘lib Gamilton qo‘llagan.

Qariyb bir vaqtning o‘zida shu yo‘nalish bo‘yicha boshqacha nuqtai nazar bilan nemis matematigi German Grassman ham vektor tushunchasini rivojlantirgan. Angliyalik Uillyam Klifford (1845-1879) bu ikki yo‘nalish, bu ikki nuqtai nazarni nazariy jihatdan birlashtirishga, umumlashtirishga muvaffaq bo‘ldi. Amerikalik matematik Djozayi Uillarda Gibbs (1839-1903) 1901-yilda vektor analizi bo‘yicha darslikni chop etdi va bu tushunachaga yakuniy xulosa berdi[8].

Asosiy qism.

O‘tgan asr oxiri va hozirgi asr boshlarida vektorlar ustida amallar va uning qo‘llanishi keng rivojlandi. Vektor algebrasi, vektor analizi vektor fazosining umumiy nazariyasi kabi bilimlar yaratildi. Bu bilimlar hozirgi zamon fizikasining asosiy qismi bo‘lgan nisbiylik nazariyasida keng ishlatilishi natijasida yanada mustahkamlandi.

Vektor tushunchasi uzunlik va yo‘nalishiga ega bo‘lgan barcha ob’yektlarda qo‘llaniladi. Masalan: fizikada kuch, tezlik,tezlanish va hokazo. Nafaqat o‘lchov birligiga uo‘nalishga ega bo‘lgan kattaliklardir. Shunaqa og‘ishlardan biri vektorlardir. Ular qulay, ularning foydalanilishi tabiiy va odatda ular ustida azaldan amallar bajarilib kelmoqda deb o‘ylashadi. Lekin bu noto‘g‘ri. Hatto Maksvell kitobida ham biz dekart koordinatalar sistemasida hosilalarni vektor belgilashni uchratmaymiz. Bu-XIX asrning ikkinchi yarmi, shunda ham vektor belgilash hali qo‘shila olmadi.

Vektorlardan ancha oldin fanga kvaternionlar kiritilgan. Bu g‘aroyib kattalikni Gamilton o‘ylab topgan. Kvant mexanikasi ijodkorlari nafaqat fizik, balki buyuk matematiklar bo‘lgan Gamilton va Lagranj ijodidan mamnunlar. Gamilton XIX asrda ijod qilgan, lekin u yaratgan kanonik forma bugun ham foydali. Kvaternionlarv(sonlar to‘rtligi bilan ifodalanadi) va oddiy haqiqiy vektor-turli tushunchalar. Gamiltondan biroz keyinroq bizga boshqa yo‘nalishda mashhur bo‘lgan amerikalik olim Gibbs yashab o‘tdi. Agar amerikaliklar rozi bo‘lganda men Gibbsni kichik Nyuton deb nomlagan bo‘lardim. Nega deb so‘rarsiz? U butun haotini kichik shaharcha Nyu-Xeyvenda o‘tkazdi va Yelskiy universitetida dars berdi. Uning ishlari tengsiz. Lekin hozir statik mexanika haqida aytib o‘tmoqchi emasman. Gibbs 1880-yida Yelskiy universitetida o‘qigan ma’ruzalari saqlangan. U yerda vektorlar qalin harflarda belgilanmagan bo‘lsa-da, skalyar va vektor ko‘paytmalarga ta’rif berilgan va bugungi zamon talabiga javob beradigan aylana qavslar, nabl operatorida belgilangan, ya’ni mexanika vektorlar tilida ko‘rsatilgan.

Gibbsning vektorlardan foydalanish g‘oyalari tezda o‘z tasdig‘ini topmagan. Masalan, aytib o‘tilgan ingliz olimi Teyt ulardan foydalanish noqulay deb aytgan. Kvant mexanikasi paydo bo‘lishi bilan avval uncha tushunarsiz bo‘lgan kattaliklar muhim ahamiyat kasb etadi.

Xulosa

Xulosa qilib aytganda, Stereometriya kursida vektorlar mavzusini o‘qitish nafaqat fazoviy shakllarni chuqur anglash, balki muhandislik va texnik fanlarga asos bo‘ladigan fundamental bilimlarni shakllantirishda muhim o‘rin tutadi. Vektorlar yordamida fazodagi yo‘nalish, kuch, harakat kabi ko‘plab fizik va geometrik hodisalar aniq va tushunarli tarzda modellashtiriladi. Vektorlarning kelib chiqish tarixi qadimgi geometriya va mexanika fanlariga borib taqaladi, ammo bugungi kunda ular matematikaning ajralmas qismi sifatida rivojlanib, muhandislik, arxitektura, fizika kabi ko‘plab sohalarda amaliy qo‘llanilmoqda. Vektor analizining stereometriya darslarida qo‘llanilishi o‘quvchilarga fazoviy tasavvurni rivojlantirish, analitik fikrlashni shakllantirish va real muammolarni hal qilishga tayyorlash imkonini beradi. Kelajakda ushbu yo‘nalishda olib boriladigan

tadqiqotlar ta’lim jarayonining samaradorligini oshirish, shuningdek, vektorlar asosida murakkab fazoviy tizimlarni modellashtirish imkoniyatlarini kengaytirishga xizmat qiladi.

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TEXNIKUMLARDA ANIQ FANLARINI O'QITISHDA NAZARIYA BILAN AMALIYOTNING O'ZARO BOG'LIQLIGINING PEDAGOGIK ASOSLARI

Annotatsiya: *Texnikumlarda o'qituvchilarini tayyorlash sifatini ta'minlashda nazariya bilan amaliyotning o'zaro bog'liqligi asosida o'qitishning nazariy masalalari tahlil qilindi. Kasbiy tayyorgarlik darajasi yuzasidan tashkiliy va metodik izchillikni ta'minlash, modul-blok usulida ishlash tamoyili. Texnikumlarda o'qituvchilarini tayyorlashda integrativ yondashuv mutaxassislikka oid malaka, ish-harakat usullari, qiziqish va intilishlari yaxlitligini ta'minlash uchun qo'llanildi*

Kalit so'zlar: *Texnikumlarda, kasbiy moslashuvchanlik tamoyili, modul-blok usulida ishlash tamoyili, pedagogik, integrativ yondashuv, ish-harakat usullari, intilishlari.*

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PEDAGOGICAL FOUNDATIONS OF THE RELATIONSHIP BETWEEN THE THEORY AND PRACTICE OF TEACHING EXACT SCIENCES IN TECHNICAL SCHOOLS

Annotation: *The analysis of theoretical issues of teaching was carried out on the basis of the interdependence of theory and practice in ensuring the quality of training of teaching staff in technical schools. The principle of ensuring organizational and methodological continuity of the level of professional training, the principle of working according to the modular-block method. An integrated approach to training teaching staff in technical schools was used, ensuring the integrity of professional qualifications, work methods, interests and aspirations.*

Keywords:*In technical schools, the principle of professional adaptability, the principle of working according to the modular-block method, a pedagogical, integrative approach, methods of work and action, aspirations.*

Kirish

Ta'lim, fan va ishlab chiqarish nazariya bilan amaliyotning o'zaro bog'liqligi asosidasi quyidagi asosiy yo'nalishlarda rivojlantirilishi lozim:

1. Texnikumlarda vertikal bo'yicha nazariya bilan amaliyotning o'zaro bog'liqligi asosidasi:

– Texnikumlarda muassasasi, akademik litsey – Texnikumlarda muassasasi kabi nazariya bilan amaliyotning o’zaro bog’liqligi asosidalashgan ta’lim muassasalarini tashkil qilish, shu asosda:

– kasbiy tayyorgarlik darajasi yuzasidan tashkiliy va metodik izchillikni ta’minlash;

– tarmoq muammolarining yechimini topish uchun mutaxassislarni maqsadli tayyorlash;

– mutaxassis-kadrlar tayyorlashda oliy va o’rta maxsus ta’lim muassasalari moddiy-texnik bazasidan hamkorlikda teng foydalanish.

2. Texnikumlarda ning gorizontal bo’yicha nazariya bilan amaliyotning o’zaro bog’liqligi asosidasi:

-raqobatbardosh oliy ma’lumotli mutaxassis (bakalavr-magistr)lar tayyorlaydigan texnika universitetlari, o’quv-ilmiy (Texnikumlarda muassasasi-ilmiy tadqiqot instituti), o’quv-ilmiy-ishlab chiqarish (Texnikumlarda muassasasi-ilmiy tadqiqot instituti-ishlab chiqarish) va o’quv-ishlab chiqarish (Texnikumlarda muassasasi-ishlab chiqarish) birlashmalarini tashkil qilish.

Bunday nazariya bilan amaliyotning o’zaro bog’liqligi asosidalash natijasida:

– Texnikumlarda (ayniqsa hududlarda) pedagogik, ilmiy va moddiy-texnik potentsialidan samarali foydalanishga va ma’muriy-boshqaruv xarajatlarini qisqartirishga olib keladi;

– Fanlar Akademiyasi va tarmoq ilmiy tadqiqot institutlari o’quv muassasalaridagi ta’lim jarayoni bilan o’zaro aloqadorligi ta’minlanadi;

– tadqiqotchilar, pedagoglar va talabalar hamkorlikda foydalanishi uchun fundamental tadqiqotlarning tajriba-sinov va asbob-uskunalar bazasi rivojlanadi;

3. Texnikumlarda aralash (vertikal va gorizontal) nazariya bilan amaliyotning o’zaro bog’liqligi asosidasi turli darajadagi raqobatbardosh mutaxassislarni tayyorlash uchun o’quv-ilmiy-ishlab chiqarish bazalarini yaratish.

4. Texnikumlarning xalqaro nazariya bilan amaliyotning o’zaro bog’liqligi asosidasi:

– rivojlangan mamlakatlar bilan birgalikda bozor va xalqaro munosabatlar doirasida yuqori aqliy salohiyatni talab qiluvchi muhim sohalar, ekologiya yo’nalishlari va mutaxassisliklari bo’yicha hamkorlikdagi ta’lim muassasalari (Texnikumlarda muassasalari, o’rta maxsus kasb-hunar ta’limi muassasalari, malaka oshirish va qayta tayyorlash markazlari va boshqalar)ni tashkil qilish;

– iqtidorli yoshlarni ishlab chiqarish sanoati taraqqiy etgan, intellektual kuch darajasi yuqori kadrlarga boy davlatlarning etakchi ta’lim muassasalarida tahsil olishlarini tashkil qilish;

– xorijiy ta’lim muassasalari va ilmiy tadqiqot markazlari bilan talabalar, magistrlar, tadqiqotchilar almashinuvini yo’lga qo’yish maqsadida to’g’ridan-to’g’ri aloqa o’rnatish;

Xulosa

Xulosa qilib aytganda, xorijiy mamlakatlar ish tajribbasidagi kasbiy ta’limning yo’nalganligini tahlil qilish shuni ko’rsatadiki, ularda asosan

yoshlarning kasbiy tayyorgarligini ishlab chiqarish bilan uzviy bog'liq holda olib boriladi. Ishchi kuchining sifatini takomillashtirish g'oyasi bu jarayonning amaliy natijasi sifatida katta ahamiyat kasb etadi. Bu davlatlar ish tajribasini o'rganish mamlakatimizda Texnikumlarda jarayoni tizimini ishlab chiqarish va o'qitishda nazariya va amaliyotning o'zaro bog'liqligilashni amalga oshirishning asosiy yo'nalishlarini takomillashtirish imkonini beradi.

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ZAMONAVIY TA'LIM USULLARI ORQALI MAKTAB O‘QUVCHILARINING TAFAKKURINI RIVOJLANTIRISH

Annotatsiya. *Ushbu maqolada maktab yoshidagi o‘quvchilarning fikrlash qobiliyatini rivojlantirishda zamonaviy yondashuv usullari ko‘rib chiqiladi. Bugungi kunda tezkor rivojlanayotgan jamiyatda o‘quvchilarning tanqidiy, analitik va ijodiy fikrlash qobiliyatlarini oshirish zaruriyati dolzarb masalaga aylangan. Maqolada interaktiv o‘quv metodlari, loyihaviy ta'lim, raqamli texnologiyalar, kreativ fikrlashni rivojlantirish usullari va ko‘ngilochar ta'limiy faoliyatlar singari zamonaviy yondashuvlar haqida batafsil ma'lumot beriladi. Ushbu yondashuvlar orqali o‘quvchilarni qiziqtirish, ularning bilim olish jarayonini qiziqarli va samarali qilish imkoniyatlari o‘rganiladi. Shuningdek, maqolada o‘qituvchilarning roli, kelajakdagi tendensiyalar va yangi innovatsiyalar haqida ham so‘z yuritiladi. Tavsiyalarda esa o‘qituvchilar va ota-onalar uchun foydali maslahatlar keltirilgan.*

Kalit so‘zlar: *Fikrlash qobiliyati, Zamonaviy yondashuvlar, Maktab yoshidagi o‘quvchilar, Tanqidiy fikrlash, Ijodiy fikrlash, Interaktiv o‘quv metodlari, Loyihaviy ta’lim, Raqamli texnologiyalar, STEM ta’limi, Kreativ ta’lim, Kodlash va dasturlash, Onlayn ta’lim platformalari*

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DEVELOPMENT OF SCHOOLCHILDREN'S THINKING WITH THE HELP OF MODERN EDUCATIONAL METHODS

Annotation. *This article examines modern approaches to the development of thinking ability of school-aged students. Today, in the rapidly developing society, the need to improve students' critical, analytical and creative thinking skills has become an urgent issue. The article provides detailed information about modern approaches such as interactive learning methods, project-based learning, digital technologies, methods of developing creative thinking, and entertaining educational activities. Through these approaches, opportunities to interest students and make their learning process interesting and effective are explored. The article also discusses the role of teachers, future trends and new innovations. Recommendations contain useful tips for teachers and parents*

Keywords: *Thinking Skills, Contemporary Approaches, School-Age Students, Critical Thinking, Creative Thinking, Interactive Learning Methods, Project-Based Learning, Digital Technologies, STEM Education, Creative Learning, Coding and Programming, Online Learning platforms.*

Mavzuning dolzarbligi: Bugungi kunda dunyo tezkor suratlarda rivojlanmoqda va bilim iqtisodiyoti davriga kirib bormoqda. Ushbu sharoitda yosh avlodning fikrlash qobiliyatini rivojlantirish nafaqat individual muvaffaqiyat uchun, balki jamiyatning umumiy taraqqiyoti uchun ham nihoyatda muhimdir. Maktab yoshidagi o‘quvchilarni tanqidiy, analitik va ijodiy fikrlashga o‘rgatish ularning kelajakdagi hayotida muhim rol o‘ynaydi, chunki zamonaviy jamiyatda oddiy bilimlarni yod olishdan ko‘ra, muammolarni hal qilish, yangi g‘oyalarni ishlab chiqish va ularni amaliyotga tatbiq etish ko‘nikmalari ko‘proq talab qilinadi.

Maqsad va vazifalar: Ushbu maqolaning asosiy maqsadi maktab yoshidagi o‘quvchilarning fikrlash qobiliyatini rivojlantirishda zamonaviy yondashuv usullarining ahamiyatini o‘rganish va ularni ta'lim jarayonida samarali qo‘llash yo‘llarini tahlil qilishdir. Maqola orqali zamonaviy ta'lim metodlari va texnologiyalarining o‘quvchilarning tanqidiy, analitik va ijodiy fikrlash qobiliyatlarini oshirishga qanday ta'sir ko‘rsatishini yoritish ko‘zda tutilgan.

Zamonaviy yondashuv usullari

1. Interaktiv o‘quv metodlari:

- Munozaralar va debatlar: O‘quvchilarning tanqidiy va analitik fikrlash qobiliyatini rivojlantirish uchun.
- Rol o‘yinlari va simulyatsiyalar: Hayotiy vaziyatlarni yechishda ijodiy yondashuvlarni shakllantirish.

2. Loyihaviy ta’lim:

- Loyihalar asosida o‘rganish: O‘quvchilarga mustaqil va guruhiy loyihalar berish orqali mas’uliyat va hamkorlik qobiliyatlarini oshirish.
- Tadqiqot va innovatsiyalar: O‘quvchilarga yangi g‘oyalar va yechimlar topish uchun tadqiqot qilish imkoniyatlarini yaratish.

3. Raqamli texnologiyalar va vositalar:

- Kodlash va dasturlash: Kompyuter dasturlash orqali mantiqiy va tizimli fikrlash qobiliyatlarini rivojlantirish.
- Onlayn ta’lim platformalari: Khan Academy, Coursera, EdX kabi platformalarda turli kurslardan foydalanish.
- Interaktiv dasturlar va o‘yinlar: Ta’lim jarayonini qiziqarli va samarali qilish uchun raqamli o‘yinlar va dasturlar.

4. Kreativ fikrlashni rivojlantirish:

- Ijodiy yozuv va san’at: Hikoyalar yozish, rasm chizish va boshqa san’at turlari orqali ijodiy fikrlash qobiliyatlarini oshirish.
- STEM va STEAM dasturlari:Fan, texnologiya, muhandislik, san’at va matematika bo‘yicha keng qamrovli bilim va ko‘nikmalarni rivojlantirish.

5. Ko‘ngilochar va ta'limiy faoliyatlar:

- Ekoklub va ilmiy jamiyatlar: O‘quvchilarni ekologik va ilmiy tadqiqotlarga jalb qilish.
- Madaniy va sport tadbirlari: Jismoniy va madaniy faoliyatlar orqali ijtimoiy va jamoaviy ko‘nikmalarni rivojlantirish.

Xulosa

1. Zamonaviy yondashuvlarning afzalliklari:

- Ushbu usullar orqali o‘quvchilarni qiziqtirish va ularning o‘z-o‘zini rivojlantirishga bo‘lgan intilishlarini oshirish.

2. O‘qituvchilarning roli va mas’uliyati:

- O‘qituvchilarni zamonaviy yondashuvlardan foydalanishga rag‘batlantirish va o‘qitish usullarini takomillashtirish.

3. Kelajakda foydalanish mumkin bo‘lgan yangi usullar va texnologiyalar:

- Fikrlash qobiliyatini rivojlantirishda yangi texnologiyalar va yondashuvlar.

Tavsiyalar

1. O‘qituvchilar va ota-onalar uchun maslahatlar:

- O‘quvchilarga qo‘shimcha mashg‘ulotlar va resurslar bilan ta’minlash.

- Ota-onalarning bolalarning ta’lim jarayonida faol ishtirok etishlari uchun tavsiyalar.

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GENE EXPRESSION BETWEEN NORMAL TISSUE AND UTERINE ENDOMETRIOID CANCER CELLS

Abstract: *The prevalence of endometrial cancer is on the rise worldwide, making it a serious public health concern. Comprehending the molecular processes that underlie this illness is essential to creating successful treatment plans. Our goal was to describe the transcriptional alterations in endometrial cancer tissues in comparison to healthy tissue that had been corrected. 2483 differentially expressed genes (DEGs), including those that code for proteins, long non-coding RNAs (lncRNAs), and microRNAs (miRNAs), were found by RNA sequencing. The differential expression of numerous known cancer-related genes, including MYC, AKT3, CCND1, and CDKN2A, was noteworthy.*

Keywords: *Endometrial cancer, transcriptome, differentially expressed genes, non-coding RNAs, pathway analysis.*

Introduction

One of the most prevalent malignancies in women and the most prevalent gynecological cancer in developed nations is endometrial cancer. Furthermore, uterine cancer death rates [3] and incidence [1,2] are on the rise, which is alarming.

Obesity is the most significant risk factor for endometrial cancer aside from age and one of the main contributors to the elevated incidence rates [2]. Endometrial cancer has the greatest correlation with obesity among the 20 most prevalent tumor forms [4]. For every 5 kg/m2 increase in BMI, the risk of endometrial cancer increases quickly [5, 6]. The conversion of adrenal androgens into estrogen by adipose tissue raises estrogen levels. Proliferation of the endometrium is stimulated. Additionally, obesity is frequently linked to hyperinsulinemia and insulin resistance, which can increase the bioavailability of insulin-like growth factor 1 (IGF-1) and estrogen and further stimulate the endometrium. In addition to being linked to enhanced endometrial proliferation, these factors also stimulate the PI3K–AKT–mTOR signaling pathway [2]. Endometrial cancer's current molecular categorization was introduced in 2013 [8] and is still being developed []. This categorization focuses on alterations in the nuclear DNA of tumor cells, particularly copy number variations, mismatch repair (MMR) deficiencies that cause microsatellite instability, and mutations in the polymerase epsilon (POLE) and TP53 genes [7,8]. Additionally, RNA expression changes that were not caused by gene mutations were considered. The group that lacked mismatch repair was found to have lower levels of MLH1 mRNA expression. There have been reports of increased expression of RAD50 in tumors with low copy number and increased expression of

mRNAs responsible for cell cycle dysregulation (CCNE1, PIK3CA, MYC, and CDKN2A) in tumors with endometrioid histology [8].

Materials and methods

5 endometrial cancer patients from Samarkand and two from Tashkent were included in the study; all had abdominal hysterectomy procedures carried out in compliance with the Declaration of Helsinki. The majority of the patients (n = 18) were Samarkandian. The patients' average age was 62.19 years, and their average BMI was 33.06 kg/m2, albeit one patient's height was unknown. The histology of each tumor was endometrioid.

The endometrial cancer's FIGO Grades and Stages were determined by analyzing the uterine tissue. About 25 mg samples of the cancer and healthy tissues were submerged in DNA/RNA Shield (Zymo Research). After that, RNA was isolated from the sliced portions using the Quick-RNATM Miniprep Kit (Zymo Research). The creation of sequencing libraries, rRNA depletion, and reverse transcription were subsequently carried out using the RNA HyperPrep Kit with RiboErase (HMR) (KAPA). After that, the libraries were sequenced using Illumina's NextSeq 500 platform.

Results and discussion

According to KEGG pathway analysis, DEGs were implicated in a number of functions, such as circadian entrainment, cell adhesion, cGMP-PKG and oxytocin signaling, amino acid biosynthesis, glycolysis/gluconeogenesis, cell cycle control, and more (Fig. 1C). Wnt signaling, cell-extracellular matrix interactions, smooth muscle contraction, and extracellular matrix structure were all downregulated, which is consistent with the KEGG pathways, Reactome database pathways, and Gene Ontology (GO) enrichment studies. Most of the participants were 60-year-old postmenopausal women. As a known risk factor for this condition, obesity was represented by the cohort's average BMI, which was within the obese range. The relationship between BMI and differential gene expression has also been previously noted, as it has been shown that a higher BMI is linked to a non-specific molecular profile and that genes linked to obesity are markedly elevated with increasing BMI among endometrioid ECs [9,10]. The top 20 differentially expressed protein-coding genes comprised a number of known endometrial cancer prognostic markers. CTSV, CEACAM1, and PDIA3 expression is linked to positive patient outcomes, according to The Human Protein Atlas, especially when it is high, as it was in our cohort [11]. Recent studies have further clarified the roles of some of these genes in endometrial cancer: low HOXA13 expression is linked to poorer survival rates and may be a prognostic biomarker [14], DUSP1 transcription inhibits tumor growth and invasion while promoting apoptosis through regulation of the MAPK pathway [13], and KLF2 transcription suppresses cell proliferation, invasion, and migration [12].

Conclusions

By confirming and comparing its differential expression data to earlier research, this study contributes to the expanding body of knowledge on the

molecular foundation of endometrial cancer and offers insights into the molecular mechanisms underlying the disease.

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УДК 004

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STUDY ON THE PATH OF CULTIVATING TALENTS FOR GOVERNMENT SERVICE INFORMATIZATION IN THE ERA OF BIG DATA

Abstract: *With the rapid development of big data technology and the in-depth promotion of digital government construction, the demand for government service informatization talents is growing. Based on the existing research results, this paper discusses the path of government service informatization talent training in the era of big data. By analyzing the demand for talents in the construction of digital government, the current status quo and problems in the training of talents, it puts forward specific paths such as optimizing the curriculum system, strengthening the cultivation of practical ability, and establishing the mechanism of cooperation between government, schools and enterprises, with a view to providing theoretical references and practical guidance for the cultivation of talents in informationization of government services.*

Keywords:*Big Data Era; Government Services; Informatization Talents; Cultivation Path; Digital Government*

With the rapid development of information technology, big data has become a key force driving social progress and economic development. In this context, government service informatization, as an important part of digital government construction, presents new characteristics and trends in the demand for talents. Chen Yanliang pointed out that the construction of digital government requires a large number of talents with the composite ability of information technology and government affairs management, while the current talent training system is not yet able to meet this demand. Nong Yuanxian further emphasized that grassroots government informatization construction especially needs composite talents who know both technology and business. Therefore, it is of great theoretical and practical significance to study the cultivation path of government service informatization talents in the era of big data.

I. Connotation of China's digital reform and digitisation of government effectiveness

1.1 The demand for talents in the construction of digital government is characterized by diversification and composite. First, technical ability is the foundation. Government service informatization talents need to master cutting-edge technologies such as big data, cloud computing and artificial intelligence, and be able to apply these technologies to the actual scenarios of government services.

Chen Yanliang's research shows that the construction of digital government requires not only technical experts, but also composite talents who are able to combine technology with government service needs.

1.2 Business comprehension is equally important. Government service informatization talents need to have a deep understanding of the business processes and needs of government departments in order to design an informatization solution that meets the actual application scenarios. Nong Yuanxian pointed out that many problems in the construction of grass-roots government service informatization stem from technicians' insufficient understanding of business requirements.

1.3 The ability to innovate is also key. In the era of big data, government services are facing many new challenges and opportunities, which require talents with innovative thinking and problem-solving ability. Informatization talents should have a forward-looking vision and innovation ability to cope with the rapidly changing technological environment.

II.Current status and problems of talent training

2.1 At present, there are still many problems in the cultivation of government service informatization talents. First, the curriculum system is out of touch with the actual needs. The curricula of many colleges and training institutions favor theory and lack the combination with the actual government service scene, which makes it difficult for students to quickly adapt to the workplace after graduation. There is a disconnect between theory and practice in the training of e-government talents.

2.2 Insufficient cultivation of practical ability. The informatization of government services requires a great deal of practical experience, while the current education system tends to neglect the practical aspects, and the practical ability to operate in the e-government environment is generally insufficient.

2.3 The mechanism for cooperation between government, schools and enterprises is imperfect. The cooperation among universities, enterprises and government departments is not close enough, resulting in a gap between talent training and market demand. We call for the establishment of a closer cooperation mechanism between government, schools and enterprises to promote the cultivation of informatization talents. Insufficient cultivation of practical ability. Informatization of government services requires a lot of practical experience, while the current education system often neglects the practical aspects, and the practical operation ability in the e-government environment is generally insufficient.

III.The Path of Cultivating Talents for Informatization of Government Services

Aiming at the above problems, this paper proposes the following cultivation path:

1. Optimize the curriculum system

Colleges and universities and training institutions should optimize the curriculum by combining with the actual needs of government service informatization, increase the number of courses on big data technology, government

management, policy analysis, etc., and pay attention to the balance between theory and practice.

2. Strengthen the cultivation of practical ability

Enhance the practical operation ability of students by establishing practical training bases, carrying out school-enterprise cooperation projects, and organizing internship practice.

3. Establishing the cooperation mechanism between government, universities and enterprises

The government, universities and enterprises should strengthen the cooperation, formulate talent cultivation plans together, carry out joint research projects, and promote the seamless connection between talents and the market.

4. Strengthening Continuing Education and On-the-Job Training

For on-the-job personnel, carry out diversified continuing education and training programs to enhance their information technology and governmental management capabilities.

IV.Conclusion

The era of big data has put forward higher requirements for government service informatization talents, and the current talent training system needs to be reformed urgently. By optimizing the curriculum system, strengthening the practical ability training, and establishing the government-school-enterprise cooperation mechanism and other paths, the quality of talent training can be effectively improved to meet the demand for composite talents in the construction of digital government. Future research can further explore how to use emerging technologies such as artificial intelligence and blockchain to optimize the talent training model to cope with the changing technological environment.

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IMPORTANCE OF INNOVATIONS ON DEVELOPING COMPANIES

Abstract: *In the period of globalisation a lot of spheres of the economy meet with financial difficulties. In these positions managers of companies decide to maintain and develop companies activity. This article explains the importance of innovations for developing companies.*

Key words: *Innovation, development, business, management, globalization, innovation management, competitiveness.*

Intorduction.

the word economy differs from periods with typical features for the periods. At the beginning of xx century, as a result of developing science and technology world spheres begun to rise up. It formed to manage all spheres for acting and developing. During the period developing technic processes of producing were based on mechanic. After that period it was begun processes of producing were based on electrical equipment. As results of researching, for increasing transactions of production it was invented more comfortable equipment. Afterwards electric accounting machines were invented and used on all spheres. Supporting with computers of all spheres affected and industries have been begun automation. It was begun that news and changes at processes of producing to call innovation on the science. Innovation has become one of the main factors in finding a place in a market economy based on strong competition, withstanding competition, development and expansion, as well as meeting the needs of consumers. Beneficial, high-quality innovations and changes in the industry are necessary conditions for innovation.

If we look at the history of the development path of the world's developed and rapidly developing countries, all of them have been able to achieve industrial development through the widespread introduction of innovations in industries and sectors, resulting in sustainable economic growth. In particular, the history of the transformation of the united states led to the industrial revolution through the widespread introduction of innovations in the economy, led by the agricultural sector from the middle of the xix century until world war i, which ensured the development of the economy.[1]

the global innovation 1000 study shows that the most profitable enterprises in 2019 in 2019 had a profitability ratio (11%) and economic growth rate (22%). These figures not only grow faster than the rest of these enterprises, but also operate more efficiently. [2] at the heart of such economic development is the fact that enterprises are implementing more innovations in their activities than other competitors. Therefore, today innovations are considered as the main source of development of enterprises and industries of the world community. Therefore,

innovations and their orientation to the activities of enterprises is one of the most pressing issues today.

in modern economic theories, innovation is recognized as the main source of development of industries and sectors, and the lack of a well-established theory of innovation, [3] has led to the emergence of many of its content and concepts. However, we note that all researchers in the research center refer to the content of "innovation" and "change" in the final conclusion. The term innovation is expressed in terms of the introduction of new or created products, technical innovations in production processes, changes in certain stages of production, in terms of their introduction into all stages of production, depending on the activities of enterprises. Depending on the scope and results of innovations, they can be divided into the following 3 groups.

according to the representatives of the first group, innovation is the result of an activity (h.b. dusaev, a.s. kulagin, p. Lemerl, o.p. molchanova, d.v. sokolov, a.v. surin, a.b. titov , r.a. fatkhutdinov, etc.);

according to the representatives of the second group, innovation is a process (v.n. lapin, v.g. medynsky, b. Santo, b. Twiss and others);

in the eyes of the third group, innovation is change (p. Druker, la perre, f. Nixon, a.i. prigogine, y. Shumpeter, etc.).

the term innovation was first used scientifically by the austrian economist j.a.schumpeter (1934) in his theory of economic development, in which entrepreneurship was expressed in a new thing, new idea, method, or device, expressing a relationship with innovation. Innovation is the economic key to the development of any company, country or region. As a result of the introduction of innovations, technology will change, the old production industries will be reduced and renewed. [4]

in the central parts of the theory of entrepreneurship development, schumpeter believes that the main source of entrepreneurial development is innovation, which is reflected in changes in raw materials, technology, machinery, finance, products, etc. [5] in his view, the innovations are reflected in:

-production of a new product or improvement of product quality

-introduction of a new method of production

- implementation of external changes

- finding new markets for products and raw materials

from the research work of the scientist, innovations are considered as a key factor in the growth of the whole society, and business entities are considered as entities that like to realize constant innovations. At the same time, he emphasizes the importance of innovative changes in society and companies, which will certainly benefit society, humanity and, of course, business.

economist zaltman (1973) and several other researchers under his leadership conducted research on innovation, its content, types and economic significance, and studied the term innovation as a broad word in 3 groups of theoretical views.

at first glance, the focus of research is the manifestation of innovation in a new product, process and organizational form, at second glance, the main emphasis

is on user perception or impact of innovations, and at third theoretical focus on innovative development processes. At the same time, zaltman interprets innovation management as a key link in the process of innovative development. [6]

in addition, many scholars including p.druker, dogdson, dadfar, damanpour, b.s. the research work of lavson, d. Samson, j. Vozniak, r. Fatkhutdinov, a. Porshneva, b. Varlamov and others covers innovation management, innovation and innovation potential, its composition and factors affecting it, and other features.

based on the research and conclusions of economists and scientists, the following conclusions were drawn. The term innovation is a broad term used by consumers, producers and the state as a broad term.

today, at a time of rapid scientific and technological progress, it has become a requirement of the time to introduce innovations in the stages of production in order to expand and develop the activities of existing businesses in the economy. From this point of view, when innovations are initially considered by consumers, it is the result of the emergence of a new type of product or service, improved product quality, increased consumer preferences, the addition of a new product range, stabilization of product prices. On the other hand, from the point of view of manufacturing enterprises, innovations and changes in the stages of the production process are described as innovations in order to be competitive among similar competitors in the open market, increase market share, maximize profits. Innovation is a global engine of economic growth and at the same time a key factor in competitiveness. [7].

Conclusion. In summary, as recognized by most researchers, innovations are manifested in the following types of enterprises.

- goods and service innovation
- innovation of production process (technology)
- marketing innovation
- innovation of management structure of the enterprise.

as a result of the creation of a new product, product innovation is formed.

as a result of changes in production processes and technology, production innovation is formed. As a result of changes in the product sales strategy, marketing innovation is formed. Changes in the structure of the internal management structure of the enterprise lead to innovation of the management structure. The following conclusions were drawn from the above studies:

in this era of globalization, enterprises need to enter the markets, increase their share and develop, to innovate and implement them in practice, to increase the level of production and quality based on the wishes and desires of consumers, and the state to monitor economic growth. As followings, innovation is considered as a key driver of economic growth of the country.

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AVTOBIOGRAFIK DISKURSDA FRAZEMALARNING LINGVOMADANIY AHAMIYATI

Annotatsiya: *Mazkur maqolada avtobiografik diskursda ishlatilgan frazeologik birliklarning lingvomadaniy mazmuni, ularning shaxs xotirasini ifodalashdagi roli hamda milliy-madaniy identitetni shakllantirishdagi ahamiyati tahlil qilinadi. Muallif frazemalar orqali milliy qadriyatlar, mentalitet, tarixiy voqelik va shaxsiy tajribalar qanday ifodalanishini ko‘rsatadi. Maqolada frazeologizmlar til va madaniyat o‘zaro ta’sirining yorqin namoyoni sifatida baholanadi.*

Kalit so‘zlar: *avtobiografik diskurs, frazeologizm, lingvomadaniyat, identitet, madaniy kod, milliy tafakkur*

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THE LINGUOCULTURAL SIGNIFICANCE OF PHRASEOLOGICAL UNITS IN AUTOBIOGRAPHICAL DISCOURSE

Abstract: *This article explores the linguocultural significance of phraseological units in autobiographical discourse. It examines their role in conveying personal memory, mentality, historical context, and cultural values. The author argues that phraseological expressions serve as markers of both individual and collective identity, representing the deep interrelation between language and culture within the autobiographical narrative.*

Keywords: *autobiographical discourse, phraseologism, linguoculture, identity, cultural code, national mentality*

Frazeologik birliklarning tilshunolikdagi ilmiy ahamiyati juda ham yuqori. Frazeologik birliklar, ya’ni idiomalar yoki barqaror ifodalar, tilning tuzilishi va ifoda boyligida muhim o‘rin egallaydi. Tilshunoslik nuqtai nazaridan ular lug‘at tarkibining tizimli qatlamini tashkil etib, faqatgina til qonuniyatlarini emas, balki madaniy, tarixiy va kognitiv jihatlarni ham aks ettiradi. Frazeologik birliklarni ilmiy

o‘rganish tilshunoslikning bir necha yo‘nalishlariga hissa qo‘shadi: Semantika sohasida ular ma’no qanday qilib kompozitsiyaviy bo‘lmagan shaklda (ya’ni alohida so‘zlarning ma’nosidan bevosita kelib chiqmaydigan tarzda) shakllanishini tushuntiradi. Pragmatikada ular gapiruvchilar qanday qilib barqaror iboralar yordamida hissiyot, baho yoki ijtimoiy munosabatlarni ifodalashini ko‘rsatadi.Kognitiv tilshunoslikda frazeologizmlar aqliy modellarga va kontseptual metaforalarga bog‘langan bo‘ladi. Madaniyatlararo kommunikatsiyada esa ular milliy mentalitet va madaniy o‘zlik xususiyatlarini ochib beradi hamda tarjima nazariyasi va madaniyatlararo kompetensiyani rivojlantirishda muhim rol o‘ynaydi. Bundan tashqari, frazeologik birliklar til o‘rgatishda, ayniqsa ona tilida ham, chet tilida ham ravon va idiomatik nutqni shakllantirishda asosiy ahamiyatga ega. Ularni e’tibordan chetda qoldirish tilning sun’iy yoki ortiqcha so‘zlar ko‘p qo‘llanishiga olib kelishi mumkin.

Demak, frazeologiya tilning chekkadagi emas, balki asosiy tarkibiy qismi bo‘lib, u nafaqat nutq malakasini rivojlantirishda, balki chuqur ilmiy tahlil uchun ham muhim sohaga kiradi. Frazeologik birliklar— idiomalar, kollokatsiyalar, maqollar, matallar va boshqa barqaror iboralarni o‘z ichiga olgan holda har qanday tabiiy tilning ajralmas va murakkab qismini tashkil etadi. Ularning tadqiqi leksikologiya, semantika, pragmatika, kognitiv tilshunoslik, sotsiolingvistika va lingvokulturologiya kabi tilshunoslikning turli yo‘nalishlari bilan bevosita bog‘liqdir. Frazeologik birliklar quyidagi xususiyatlarga ega:

Tuzilmaviy barqarorlik — ularning shakli qat’iy yoki qisman qat’iy bo‘lib, grammatik o‘zgarishlarga qarshilik ko‘rsatadi.

Semantik yaxlitlik — ifoda ma’nosi ko‘pincha uning tarkibidagi so‘zlar ma’nosidan bevosita anglashilmaydi (masalan, “kick the bucket” = “vafot etmoq”).

Qayta qo‘llanish (reproduktivlik) — ular tayyor til birligi sifatida ishlatiladi, bu esa nutq tejamkorligi va samaradorligini oshiradi.Bu barqarorlik nutq egasiga tilni erkinroq va idiomatik tarzda ishlatish imkonini beradi hamda tilning formulasimon tabiatini ochib beradi. Frazeologizmlar konnotativ ma’nolarni ifodalaydi va nutq jarayonida pragmatik vazifalarni bajaradi: Emotsional munosabatni yetkazish (masalan: “yettinchi osmonda uchib yurmoq” = juda quvonmoq), fikrni kuchaytirish (masalan: “xullas”, “to‘g‘risini aytganda”), kinoya, istehzo yoki xushmuomalalikni ifodalash. Suhbat jarayonida frazeologik birliklar nozik va kontekstga mos aloqani ta’minlab, nutq ifodaviyligini va aniqligini oshiradi. Kognitiv tilshunoslik nuqtai nazaridan: frazeologizmlar ko‘pincha kontseptual metaforalarni aks ettiradi, masalan: “vaqt — bu pul” (masalan: “vaqtni sarflamoq”, “vaqtni yo‘qotmoq”). Ular madaniy bilim, dunyoqarash va jamoaviy tajribani kodlaydi. Ularni o‘rganish orqali til inson tafakkurini qanday aks ettirishi va shakllantirishi tushuniladi. Shunday qilib, frazeologik birliklar oddiy leksik birlik emas, balki xalq tafakkurini aks ettiruvchi kognitiv vositalardir. Har bir til o‘ziga xos madaniy asoslangan frazeologik birliklarga ega masalan: inglizcha: “a storm in a teacup”, o‘zbekcha: “tog‘ni ko‘rmay, pashshani urmoq”, fransuzcha: “faire d’une mouche un éléphant”. Ularning ko‘pi boshqa tillarda aniq ekvivalentga ega emas, bu esa tarjima va til o‘rgatishda muammolar keltirib chiqaradi.

Frazeologiyani o‘rganish madaniyatlararo kommunikatsiyani yaxshilaydi va matnlarni moslashtirish (lokalizatsiya)da, ayniqsa adabiyot, reklama va diplomatiya sohalarida muhim o‘rin tutadi. Chet tilini o‘qitishda frazeologik kompetensiya yuqori darajadagi til bilish ko‘rsatkichidir. Idiomalarga ega bo‘lgan o‘rganuvchilar tilni tabiiy va ona tilidek tarzda qo‘llay oladilar. Sun’iy intellekt va tabiiy tilni qayta ishlash (NLP) sohasida frazeologizmlarni aniqlash va tushunish mashinali tarjima, muloqot botlari, his-tuyg‘ularni tahlil qilish, ovozli yordamchilar kabi tizimlar uchun zarurdir. Frazeologizmlar ko‘pincha so‘zma-so‘z tarjimaga bo‘ysunmaydi va kontekstga asoslangan idiomatik talqinni talab qiladi. Frazeologik birliklar — tilning oddiy bezagi emas. Ular tilning ifodaviy kuchining markaziy unsurlari, nutq, shaxsiylik va muloqotni tushunishda kalit omillaridir. Ularning ilmiy tadqiqi bizga til qanday ishlashi, inson qanday o‘ylashi, va madaniyat qanday saqlanib, til orqali uzatilishini anglashda muhim bilimlarni beradi.

O‘zbek tilshunosligida frazeologizmlar bo‘yicha ilmiy tadqiqot ishlarini olib borgan, o‘zlarining ilmiy asoslangan nazariy qarashlarini ilgari surgan olimlarimizdan M. Yo‘ldoshev – frazeologizmlarning tarkibi, strukturasi va stilistik funksiyasi haqida chuqur tadqiq qilgan. N. Mahmudov – frazeologik birliklarning lingvistik va leksik-semantik xususiyatlarini o‘rgangan.

M. Mirzaahmedov – o‘zbek frazeologizmlarining lug‘aviy va semantik jihatlarini tadqiq qilgan. Ushbu ishlarning asosiy g‘oyalari negizida frazeologizmlar – tayyor til birliklari bo‘lib, ko‘pincha obrazli ifoda va xalqning milliy tafakkurini aks ettirishi, milliy-madaniy identitet ko‘zgusi sifatida tilning lingvokulturologik qatlamini belgilashi kabilar yotadi.

Jahon tilshunosligida ham frazeologizmlar olimlar tomonidan samarali o‘rganilgan. A.V. Kunin rus olimi, lekin ingliz frazeologiyasining yetuk tadqiqotchisi hisoblanadi. J.R. Firth – frazeologik birliklarning kontekstdagi o‘rni va kollokatsiyalar nazariyasini ishlab chiqqan. John Sinclair – “corpus linguistics” asoschisi, frazeologik birliklarni katta hajmdagi matnlarda tahlil qilgan. Fernando & Flavell – frazeologik birliklarni turlarga ajratish usulini taklif qilgan. Yuqoridagi olimlar qarashlariga ko‘ra ingliz tilida frazeologik birliklar idioms(idiomalar), collocations(iboralar), phrasal verbs(so‘z birikmalari) kabi shakllarda uchraydi.

J.R. Firth fikriga ko‘ra, “you shall know a word by the company it keeps” – ya’ni so‘zlar o‘z kontekstida ma’no kasb etadi. Frazeologik birliklar tilda reproduktiv (qayta ishlatiladigan) birlik sifatida qatnashadi.

Bundan tashqari Germaniyalik Wolfgang Fleischer – frazeologiyaning klassik nazariyotchilaridan biri hisoblanadi. Helmut Glück – frazeologik birliklar, idiomlar, metaforalar va tilda ularning vazifasi haqida izchil nazariyalar yaratgan. Rosemarie Gläser – frazeologiyaning semantik va stilistik tahlil usullarini ishlab chiqqan. Nemis tilshunosligida frazeologizmlar – sprachliche Einheiten, ya’ni til birliklari sifatida tahlil qilinadi. Idiomlarning nicht-wörtlich Bedeutung (so‘zma-so‘z bo‘lmagan ma’no) asosida talqini keng o‘rganiladi. Frazeologik birliklar ijtimoiy-madaniy kontekstda ham o‘rganib kelingan. Frazeologizmlar lingvokulturologik yondashuvda til va madaniyat o‘rtasidagi ko‘prik vazifasini

bajaradi. Ular o‘zbek tilida milliy mintalitet, tarix va steriotiplarni aks ettiruvchi semantik birliklar bo‘lib, frazema shaklida aniq ko‘rinish topadi.

Avtobiografik diskursda frazeologizmlarning o‘rni dolzarb va chuqur ilmiy masala bo‘lib, shaxsiy tajriba va madaniy xotiraning stilistik, lingvokulturologik va emotsional ifodasida frazeologik birliklar muhim rol o‘ynaydi. Frazeologizmlar ichki kechinmalar, hissiyotlar va holatlarni ifodalashda tabiiy va ta’sirchan vositadir. Masalan: "Yuragim orqaga tortdi", "ko‘nglim g‘ash", "ichimda olov yonardi" — muallifning emotsional holatini berishga xizmat qiladi.

Avtobiografik matn — bu madaniy xotiraning til shakli, frazeologizmlar esa xalqona tafakkur, qadriyatlarni ifoda etadi. “Boshi berk ko‘cha”, “ketmonni ko‘tarish” kabi birliklar muallif hayoti kechgan davr, ijtimoiy muhitni yoritadi. Har bir muallif o‘ziga xos stilistik boylikni frazeologizmlar orqali namoyon qiladi. Bu o‘quvchi bilan dialogik (muloqotli) aloqani kuchaytiradi.

“Ko‘p suvlar oqib o‘tdi”, “hayotimning qora kunlari” — bu nafaqat hikoya, balki shaxsiy stil hamdir. Ba’zan frazeologizmlar realiya (madaniy o‘ziga xos birliklar) bilan uyg‘unlashadi: “Saboq o‘rniga do‘ppimni yedim” – bu ibora real holatni va madaniy voqeani ifodalaydi.

Avtobiografik diskursda frazeologizmlar — bu shaxsiy hayotni madaniy ifodalash vositasi, stilistik emotsiya yuklovchisi va lingvokulturologik belgidir, ular orqali subyektiv tajriba universal tushuncha sifatida taqdim etiladi.

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TO'QIMACHILIK KORXONALARI OQAVA SUVLARINI TOZALASH VA ULARDAN IKKILAMCHI FOYDALANISH

Annotatsiya*: Mazkur maqolada to'qimachilik sanoat korxonalaridan chiqayotgan oqava suvlarining tarkibi, ekologik xavfi, tozalash texnologik bosqichlari va usullari, hamda, tozalangan suvdan foydalanish imkoniyatlari yoritilgan.*

Kalit so'zlar: *Oqava suvlar, ekologik muammo, pistiya o'simligi, kislotalar, ishqorlar.*

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CLEANING AND SECONDARY USE OF WASTEWATER FROM TEXTILE ENTERPRISES

Annotation: *This article covers the composition of wastewater by enterprises of the textile industry, environmental risks, technological stages and methods of cleaning, as well as the possibilities of using treated water.*

Keywords: *Wastewater, environmental problem, pistia plant, acids, alkalis*.

Hozirgi paytda sanoatning tez suratlarda rivojlanib borishi natijasida bir qancha dolzarb ekogeografik muammolar kelib chiqmoqda.Ayniqsa, suv

resurslarini ifloslanishiga sabab bo’layotgan yirik sanoat tarmoqlari ichida to‘qimachilik sanoatining ulushi nisbatan yuqori. Chunki to‘qimachilik suvni eng ko’p miqdorda talab qiluvchi sohalardan biri sanaladi. Gazlamalarni yuvish, bo‘yash, pardozlash va boshqa texnologik jarayonlar natijasida hosil bo‘ladigan oqava suvlar eng murakkab va xavfli tarkibga ega. Ularni tozalamasdan to‘g‘ridan-to‘g‘ri suv havzalariga tashlash mavjud suvlarni sifatiga jiddiy zarar yetkazishi mumkin.

To‘qimachilik sanoati oqava suvlarining asosiy xususiyati murakkab va turli-tuman tarkibga egaligidir hamda ularni ifloslantiruvchi manbalarga quyidagilar kiradi:

1. Bo‘yoqlar va pigmentlar: matolarni bo‘yash va dizayn berish jarayonlarida turli sintetik va tabiiy bo‘yoqlar ishlatilishi suv tarkibiga jiddiy zarar yetkazib uning xususiyatlarini tubdan o’zgartirib yubormoqda.Buning oqibatida bo‘yoqlar suv rangini o‘zgartiradi, quyosh nurlarini to‘liq singdirmaydi, suvdagi organizimlarning hayotiy jarayonlarini buzilishiga olib keladi.

2. Yuvuvchi va tozalovchi vositalar: detergentlar, sirt faol moddalar , sovun va kimyoviy yuvuvchi vositalar suvni kuchli ifloslantirib suvdagi kislorod miqdorini kamaytiradi.

3. Organik moddalar va tolalar: organik aralashmalar(mato qoldiqlari,yog’-moylar,sintetik polimerlar va boshqalar) suvda muallaq holda suzib yuradi yoki suv tarkibida chirib, suvning hidini buzadi, anaerob jarayonlar boshlanishiga sabab bo’ladi va buning oqibatida suv organizimlarining yashashi og’irlashadi.

4. Og‘ir metallar: xrom(Cr), mis(Cu), marganes(Mn) kabi og‘ir metallar suvga tushishi oqibatida suvdagi organizimlar hujayra faoliyatini buzilishiga hamda undan foydalangan inson va hayvon organizimida to’planib surunkali zaharlanishga sabab bo’ladi.

5. Kislota va ishqorlar:kislotalar hamda ishqorlar suv tarkibiga tushganda suvning pH darajasini kuchli o’zgartiradi va suv organizimlarini nobut bo’lishiga olib keladi.

Ekologik xavf : ifloslantiruvchilar suv havzalariga tushsa, suv ekotizimini ishdan chiqarishi, baliqlar va boshqa suv organizmlarining yashash muhitiga salbiy tasir ko’rsatishi, tuproq tarkibining buzilishi va inson salomatligiga zarar yetkazishi mumkin.

To‘qimachilik korxonalarida oqava suvlarni tozalash bosqichlari quyidagilardan iborat:

1. Mexanik tozalash:bu bosqichda suv tarkibidan yirik va qattiq zarrachalar panjaralar ,qum ushlagichlar, yog’ ushlagichlar kabi mexanik tozalash vositalari orqali ajratib olinadi.Bu jarayon keyingi bosqichlarni tozalash samaradorligini oshirishga xizmat qiladi.

2. Fizik-kimyoviy tozalash bosqichida erigan va mayda zarrachalar, bo‘yoq qoldiqlari, yog’-moylar kimyoviy reagentlar orqali ajratiladi. Koagulyantlar (temir, alyuminiy tuzlari)suvga qo’shilganda mayda zarrachalar bir- biriga yopishib yirik zarrachalarga aylanadi. Flokulyantlar yordamida bu yirik zarrachalar cho‘ktiriladi.

Bu esa o’z navbatida tozalash jarayonini tezlashtirib sifatini oshiradi va pH darajasini normallashtirib, kislota va ishqor muvozanatini tiklaydi.

3. Biologik tozalash bosqichida esa suvdagi organik moddalar mikroorganizmlar yordamida parchalanadi.Bunda asosan ikki usuldan foydalaniladi. Bular: aerob hamda anaerob.

Aerob usulda maxsus biohovuz yoki aerotanklarda suvga havo berish orqali organic moddalar parchalanadi.

Anaerob usul kislorodsiz muhitda bakteriyalar yordamida organik moddalarni parchalanish jarayoni.

Bulardan tashqari qo’shimcha tozalash jarayoni ham olib boriladi. Qo‘shimcha tozalash va dezinfeksiya oxirgi bosqichda suvdan qolgan mayda zarrachalar, mikroorganizmlar va patogen bakteriyalar tozalanadi.Xlorlash ozonlash, ultrabinafsha nurlari bilan dezinfeksiyalash natijasida suv standartlarga mos holga keladi va qayta foydalanish imkoniyatiga ega bo’ladi.

O'zbekiston Respublikasi Fanlar Akademiyasidagi Mikrobiologiya instituta (R.Sh. Shoyoqubov va hamkasblari) tomonidan cho'chqachilik, parrandachilik komplekslaridan hamda kanopni qayta ishlaydigan korxonalardan chiqadigan oqava - suvlarni yuksak suv o'simliklar vakili pistiya (Pistia stratiotes L.) yordamida tozalash biotexnologiyasi ishlab chiqilgan va ishlab chiqarishga keng joriy qilingan.

Pistiya o'simligining to'qimachilik korxonalari oqava suvlarida o'sishi, rivojlanishi, ko'payishi va suvlarni organo-mineral moddalardan tozalanishi Yo.Q. Xayitov va boshqalar tomonidan o'rganilgan (1999).

Suv o'tlar va yuksak suv o'simliklarini oqava suviga ekkanda faqat u organik-mineral va bakteriologik ifloslanishdan tozalanib qolmasdan, ulardan qimmatbaxo ozuqabop biomassa ham olinadi.

Pistiyaning umumiy ko’rinishi

To‘qimachilik sanoatida hosil bo‘ladigan oqava suvlari tarkibida aynan

kremniy saqlovchi birikmalarga tanlovchan bo‘lgan kuchli ishqoriy kislotali

muhitga egabo‘lgan og‘ir organik va noorganik moddalar mavjudligi aniqlangan. Tabiiy suvresurslarida seriyning to‘planishi jiddiy ekologik muammolarni keltirib chiqarishi mumkin.

To'qimachilik sanoatida asosiy ekologik muammo - bu chiqariladigan suv miqdori va u ko'taradigan kimyoviy yuk. To'qimachilik sanoati juda ko'p suv talab qiladi. Suv xom ashyoni tozalash va ishlab chiqarishning butun jarayonida ko'plab yuvish bosqichlari uchun ishlatiladi. 1 kg mato ishlab chiqarish uchun taxminan 200 litr suv sarflanadi. Suv asosan quyidagilar uchun ishlatiladi: to'qimachilikka kimyoviy moddalar qo'llash va ishlab chiqarilgan mahsulotlarni yuvish. To'qimachilik oqava suvlarining xususiyatlari har xil bo'lib, ishlab chiqarilgan to'qimachilik turiga va ishlatiladigan kimyoviy moddalarga bog'liq. To'qimachilik oqava suvlari tarkibida atrof-muhit va inson salomatligiga zarar etkazuvchi ko'p miqdorda moddalar, shu jumladan to'xtatilgan va erigan qattiq moddalar, biologik kislorod talabi (BOD), kimyoviy kislorodga bo'lgan talab (KOD), kimyoviy moddalar, Cr, As, Cu va Zn kabi iz metallarni o'z ichiga oladi So'nggi 50-75 yil ichida ishlab chiqarish jarayonlarini atrof-muhitga minimal zarar etkazadigan tarzda tartibga solish bo'yicha harakatlar tobora kuchayib bormoqda. Shu bilan birga, bu sa'y-harakatlar oqava suvlarni tozalash uchun tegishli texnologiyalarni ishlab chiqish va tartibga soluvchi organlar va sanoat o'rtasida munosib munosabatlarni o'rnatishga qaratilgan.

Hosil bo'ladigan chiqindi suvlar miqdorini kamaytirish uchun manbada chiqindi hosil bo'lishini kamaytirishga tizimli yondashuvni qo'llash zarur. Boshqacha qilib aytadigan bo'lsak, bu yondashuv oqava suvlarni bir marta tozalashdan ko'ra, birinchi navbatda paydo bo'lishining oldini oladi.

Xulosa o’rnida shuni aytib o’tish lozimki, to’qimachilik korxonlari oqava suvlarini tozalash orqali ekologik xavfsizlik taminlanadi, tozalangan suvdan foydalanish imkoniyatlari to‘qimachilik korxonalari oqava suvlarini tozalagach, ularni texnik ehtiyojlar uchun ishlab chiqarish jarayonlarida qayta foydalanish ,sanoat hududidagi yashil hududlarni sug‘orish, chiqindini kamaytirish siyosatini rivojlantirish uchun ishlatish mumkin.Buning natijasida suv resurslarini tejash, atrof-muhitni muhofaza qilish va iqtisodiy samaradorlikga erishiladi.

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OQAVA SUVLARNING AYRIM GIDROEKOLOGIK XUSUSIYATLARI HAQIDA

Annotatsiya: *Aholi sonining o‘sishi, sanoatning rivojlanishi va urbanizatsiya jarayonlari oqibatida oqava suvlar miqdori kun sayin ortib bormoqda va turli xil muammolarni keltirib chiqarmoqda. Ushbu muammolarga yechim toppish maqsadida oqava suvlarni gidroekologik xususiyatlarini o’rganish muhim omil sifatida qaraladi. Mazkur maqolada oqava suvlarning hosil bo‘lishi, tarkibi va gidrekologik xususiyatlari yoritilib berilgan.*

Kalit so’zlar: *Oqava suvlar, og’ir metallar, mikroorganizimlar, sanoat oqava suvlari*

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ABOUT SOME HYDROECOLOGICAL PROPERTIES OF WASTEWATER

Annotation: *As a result of population growth, industrial development and urbanization processes, the amount of wastewater is increasing day by day and causing various problems. In order to solve these problems, the study of hydroecological properties of wastewater is considered as an important factor. This*

article covers the formation, composition and hydrological properties of wastewater.

Keywords: *Wastewater, heavy metals, microorganisms, industrial wastewater*

Kirish: Ma’lumki, tozalanmagan yoki chala tozalangan oqava suvlar to’g’ridan to’g’ri relyefga yoki suv havzalariga tahlanmoqda.Bu esa o’z navbatida daryolar, ko‘llar va yer osti suvlarini ifloslanishiga sabab bo’lmoqda. Provard natijada ekotizimlarning muvozanatining buzilishiga va biologik xilma-xillikni kamaytirmoqda.

Oqava suvlaring hosil bo’lishi turli tabiiy va suniy omillarga bog’liq bo’ladi. Bunga atmosfera yog’inlari,maishiy kommunal xo’jaliklaridan chiqadigan chiqindi suvlar,hamda turli sanoat korxonalarida ishlatilgan suvlardan hosil bo’ladi. Oqava suvlarning gidroekologik xususiyatlari va tarkibi har bir sanoat korxonasining qaysi sohaga ixtisoslashganligi,ishlab chiqariladigan mahsulotiga bog’liq holda turlicha bo’ladi. Ularning hosil bo‘lish jarayonini tushunish, ifloslanish manbalarini aniqlash va monitoring qilish uchun asosiy poydevor hisoblanadi.

Oqava suvlarning hosil bo‘lishi, tarkibi va xususiyatlarini chuqur tahlil qilib, ifloslanish manbalarini aniqlash, ekologik xavf omillarini baholash va suv resurslarini samarali boshqarish strategiyalarini ishlab chiqishga hissa qo‘shishdir.

Bugungi kunda sanoat va urbanizatsiyaning tez rivojlanishi natijasida suv resurslariga bo‘lgan talab ortib borayotgan bir paytda, oqava suvlar masalasi tobora dolzarblashmoqda. Oqava suvlar – bu maishiy, sanoat, qishloq xo‘jaligi va boshqa turli manbalardan chiqadigan suv bo‘lib, ularning tarkibida organik modda, kimyoviy moddalar, og‘ir metallar va mikroorganizmlar kabi ifloslantiruvchi elementlar mavjud.

Oqava suvlarning kelib chiqish manbalari (maishiy, sanoat, qishloq xo‘jaligi va boshqa) va ularning hosil bo‘lish jarayonlarini o‘rganish,suv tarkibidagi organik va noorganik moddalarni fizik-kimyoviy va biologik xususiyatlarini tahlil qilish lozim.

Oqava suvlarning pH, harorati, erigan kislorod miqdori, suyuqlik zichligi kabi parametrlarini o‘rganish va ularning ekologik tizimlarga ta’sirini o’rganish Gidroekologik xususiyatlarini baholash imkonini beradi.

Oqava suv tarkibida mavjud zararli moddalarning qanday manbalardan kelib chiqishini va ularning atrof-muhit hamda inson salomatligiga qanday xavf tug‘dirishini ilmiy asoslangan holda tahlil qilish kerak.

Oqava sularni tozalash usullaridan ayniqsa arzon va samarali hisoblangan bilogik usuldan foydalanib,tozalangan oqava suvlarni qishloq xo’jalii ekinlarini sug’orishga imkon yaratib beradi.Buning oqibatida oqava suvlardan qayta foydalanib mahalliy suv resurslarini tejashga olib keladi.

Yurtimizda oqava suvlarning hosil bo‘lishi, tarkibi va xususiyatlarini o‘rganish masalalari ekologiya, gidrologiya, suv resurslarini boshqarish va atrof-muhit muhofazasi sohalarida faoliyat yuritayotgan bir qator olimlar tomonidan keng tadqiq etilgan. Bunday olimlar sirasiga R.Shoyakubov, J.Qutliyev, S.Bo’riyev, Y.Xayitov, X.Murodov, S.Akramovlarni kiritish mumkin.

O’zbekiston fanlar akademiyasining “Botanika ilmiy tekshirish instituti”da ko’p yillar faoliyat olib brogan R.Shoyakubov bir qator sanoat korxonalariga oqava suvlarni biologik usulda (pistiya yuksak suv o’simligi)yordamida tozalashni o’rgangan. J.Qutliyev va S.Bo’riyevlar esa O’zbekiston fanlar akademiyasi “Mikrobiologiya ilmiy tekshirish instituti”da (miroorganizmlar va tuban suv o’simligi xlorella)yordamida oqava suvlarni biologik tozalash usullarini yo’lga qo’yishgan.Y.Xayitov ham to’qimachilik ,ipakchilik va kollektir- zovurlar suvini (yuksak suv o’simliklari pistiya va eyxorniya)yordamida oqava suvlarni tozalashni amaliyotga tatbiq etgan.

Mazkur tadqiqotchi olimlar yurtimiz ilmiy markazlari, oliy o‘quv yurtlari va ilmiy-tadqiqot institutlarida olib borilgan tadqiqotlar natijasida, oqava suvlarning hosil bo‘lishi, tarkibi va xususiyatlari masalalarini chuqur o‘rganib, atrof-muhitni muhofaza qilish va suv resurslaridan oqilona foydalanish strategiyalarini ishlab chiqishda katta hissa qo‘shishgan.

Oqava suvlarni ifloslanish holatini doimiy monitoringini olib borish atrof-muhit muvozanatini barqaror bo’lishiga xizmat qiladi.

Jamoatchilikni xabardor qilish va ekologik savodxonlikni tashkil etish

Tozalangan oqava suvlarni qishloq xo‘jaligi, sanoat va texnik maqsadlarda qayta ishlatish tizimlarini joriy etish.Resurslardan tejash va suv tanqisligini kamaytirish uchun suvni qayta ishlash texnologiyalarini optimallashtirish hamda suv tejamkor texnologiyalarni amaliyotga joriy etish maqadga muvofiq hisoblanadi.

Atrof-muhitni muhofaza qilish, suv resurslaridan oqilona foydalanish va suv ifloslanishini kamaytirish borasida qarorlar qabul qilinishi, yurtimizda ekologik xavfsizlikni ta’minlashga xizmat qiladi

Oqava suvlar tarkibida organik moddalar, noorganik moddalar, og‘ir metallar, kimyoviy ifloslantiruvchilar va mikroorganizmlar mavjud bo‘lib, bu moddalarning miqdori va turi suvning ifloslanish darajasini belgilaydi. Suvning fizik-kimyoviy va biologik xususiyatlarini aniqlash, ekologik xavf omillarini baholashda muhim o‘rin tutadi.

Kelajakda oqava suvlarni samarali tozalash va qayta ishlash texnologiyalarini rivojlantirish, monitoring tizimlarini kuchaytirish va keng xalq ommasi orasida suvdan oqilona foydalanish borasida ekologik tarbiya bilan ta’minlash orqali atrof-muhitni himoya qilish mumkin. Shu bilan birga, ilmiy tadqiqotlarga asoslanib yangi metodlar va innovatsion yechimlar ishlab chiqish, suv resurslaridan samarali foydalanishga xizmat qiladi.

Xulosa o’rnida shuni aytish joizki, oqava suvlar ifloslanishini doimiy ravishda kuzatish va nazorat qilish, shuningdek, zarur chora-tadbirlarni belgilash muhim ahamiyat kasb etadi.

Ushbu vazifalar nafaqat ekologik xavfni kamaytirish, balki suv resurslaridan oqilona foydalanish va atrof-muhitni muhofaza qilishga qaratilgan kompleks tadqiqot va amaliy yechimlarni ishlab chiqish jarayonida muhim o‘rin tutadi deb hisoblaymiz

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BO‘LAJAK BOSHLANG‘ISH SINF O‘QITUVCHILARDA KREATIV KOMPETENSIYALARINI RIVOJLANTIRISHNING PEDAGOGIK IMKONIYATLARI

Annotatsiya: *Ushbu maqolada kreativlik tafakkur jamiyat taraqqiyotining yangi bosqichlarini ta’minlash uchun xizmat qiladigan noan’anaviy fikrlash qobiliyati va taraqqiyot omillarini ta’minlashga yo‘naltirilgan tafakkur tarzi hisoblanishi va bo‘lajak boshlang‘ish sinf o‘qituvchilarda kreativ kompetensiyalarini rivojlantirishni pedagogik faoliyatda shunday o‘qitishni tashkil etish o‘quvchi kreativ fikrlovchi, kelgusida zamonaviy jamiyat va ishlab chiqarishda muhim rejalashtirish, tashkillashtirish, tahlil qilish, asoslash, motivatsiyalash, nazorat qilish kabi funktsiyalarni kreativ tashkil etish imkoniyatiga ega bo‘lishi lozimligi o’z aksini topgan.*

Kalit so’zlari: *Kompetensiya,* Innovatsion faoliyat, kreativlik, o‘quvchi, *tashabbuskorlik,* o‘qituvchining kasbiy faoliyati.

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PEDAGOGICAL OPPORTUNITIES FOR DEVELOPING CREATIVE COMPETENCES IN FUTURE PRIMARY TEACHERS

Annotation: *This article explores creativity as a non-traditional type of thinking that contributes to the advancement of society by fostering the conditions for progress. Special attention is given to the development of creative competencies in future primary school teachers and to organizing the educational process in a way that nurtures students to become creative thinkers. This, in turn, will enable them to effectively carry out essential functions in modern society and the production sector—such as planning, organization, analysis, justification, motivation, and control—using a creative approach.*

Keywords: *competence, innovative activity, creativity, student, initiative, professional activity of the teacher.*

Innovatsion faoliyat, jahon bozorida raqobatbardoshlikning yuqori darajasini ta’minlash vositasi sifatida, globallashuv sharoitida iqtisodiy subektlarning omon qolishining asosiy omillaridan biri deb ataladi.

Kreativlik innovatsiya bilan bog‘liq Tuchunchadir. R. Retrakis va boshqa olimlar fikricha, kreativlik odatda yangi g‘oyalarni ishlab chiqarishga murojaat qilish uchun ishlatiladi, innovatsiya esa g‘oyani joriy etishni va ko‘rinsha uni targ‘ib qilish bo‘yicha birgalikdagi faoliyatni nazarda tutadi. Shu sababli, ushbu kontekstdagi kreativlik asl g‘oyalarni yaratish va shakllantirish jarayoni, innovatsiya esa bu g‘oyalarni amaliyotga tarjima qilishdir; kreativlik yangi narsalarning manbai, innovatsiya esa mahsulot va xizmatlarda kreativ g‘oyalarning timsolidir. Ishbilarmonlik darajasida kreativlik korxonani rivojlantirish imkoniyatlarini aniqlash va ularni noaniqlik va o‘zgaruvshanlik va rast nominal daromad bilan ajralib turadigan iqtisodiyotda mohirona ishlatish qobiliyati sifatida qabul qilinadi. M.Runkoning ta’kidlashisha, kreativlik va innovatsiya o‘rtasidagi munosabatlarni umumiy tushunish muammolarga yechim izlash va yangi g‘oyalarni yaratish ko‘rlab tashkilotlar va korxonalar uchun asosiy vazifaga aylanishiga olib keldi.

Zamonaviy iqtisodiy sharoitda kreativlik fikrlashning moslashuvshanligini saqlashga yordam beradi va murakkab va tez o‘zgaruvshan dunyoning bir qismi bo‘lgan muammolarga javob berish imkoniyatini beradi. Shuning uchun kreativlik nafaqat komraniyalar, balki ularning xodimlari uchun ham omon qolish omili hisoblanadi. 2013-2017 yillarda britaniyalik 35 million kishi ishtirok etgan tadqiqot shuni ko‘rsatdiki, bugungi kunda kreativ xodimlarga talab ko‘rlab sohalarda - nafaqat an’anaviy ijodiy, balki qurilish, biznes tahlillari, sotish, menejment, ishlab chiqarish, ovqatlanish va hokazolarda ham kuzatilmoqda. Shu bilan birga, kreativlik bilan shug‘ullanadigan mutaxassislar talab qilinadigan faoliyat sohalari 2030 yilga kelib bandlik darajasini yanada oshirishi kutilmoqda.

Kreativlikni maqsadli o‘rganish boshlanishi XX asrning o‘rtalariga to‘g‘ri keladi va bu Gildfordning ishlari bilan bog‘liqdir. Dastlab, muallif intellektning umumiy modelini taklif qildi. Gildford ikki fikrlash oreratsiyasini ajratib ko‘rsatdi: konvergentlik va divergentlik.

Konvergent fikrlash, ko‘r g‘oyalarni birlashtirish yoki bir neshta yechimdan faqat bitta to‘g‘ri javobni tanlash kerak bo‘lsa, talab etiladi. Divergent fikrlash esa, bitta nuqtadan ko‘r miqdorda g‘oyalar taklif qilish qobiliyatidir.

Qiziquvshanlik (har qanday kreativ sohada qiziqarli savollarni yoki muammolarni aniqlash, qo‘yish, tadqiq qilish va tanqidiy baholash);

Mustahkamlik (qiyinchilik larga dush kelganda qat’iyatlilikni ko‘rsatish, noaniqlik sharoitida ishonshni namoyish etish va muammoni hal qilishda yondashuvlarni ishlab shiqish riskini olish);

Tasavvur (noan’anaviy yechimlarni taklif qilish, ularni sinab ko‘rish va yaxshilash, mos kelmaydigan ob’ektlar o‘rtasida bog‘lanishlarni o‘rnatish, intuitsiyani ishlatish);

Boshqalar bilan moslashuvshanlik (o‘z fikrlarini boshqalar bilan bo‘lishish, boshqalarga yordam berish va ularning yordamini olish, guruhda ishlash);

vaziyatga rioya qilish (yaratish uchun zarur bo‘lgan bilim va ko‘nikmalarni ishlatib, kreativ mahsulot yaratish, tanqidiy fikrlash, uni yaxshilash bo‘yicha qarorlar qabul qilish).

Muhim jihat shundaki, ta’riflangan modelda kreativlikka bog‘liq shaxsiy xususiyatlar yoki shaxsiyat xususiyatlari ham kiradi, bu Elderning rozitsiyasiga o‘xshashdir. Shu bilan birga, oxirgi nuqtada tanqidiy fikrlashni kiritish ko‘zga tashlanadi. Shunday qilib, tanqidiy fikrlash va kreativlikni ajratish ularning birlashishi bilan birga ko‘rib shiqilishi kerak. Shuning uchun, bugungi kunda ularni o‘rganish bosqichi – bu ularning integratsiyasi bosqichidir. Bu bosqichda “kreativlik” atamasi bilan birga “kreativ fikrlash” atamasi ham qo‘llaniladi.

Boshlang‘ish ta’lim doirasida o‘qituvchilarni tayyorlashning hozirgi bosqichida biz bo‘lajak boshlang‘ish sinf o‘qituvchilarining kreativ imkoniyatlari va kreativ salohiyatini amalda ro‘yobga chiqarishga imkon beradigan zamonaviy yondashuv va usullarni qo‘llash zarurligini anglamoqdamiz. O‘qituvchilarni tayyorlash amaliyotida bo‘lajak o‘qituvchining yangi yondashuvlari, texnologiyalari va an’anaviy, klassik o‘qitish usullarini birlashtirish va tizimlashtirish zarur. O‘qituvchining yangi funksiyalarini shakllantirish va kuchaytirish zarurligini kuzatishimiz mumkin. Zamonaviy o‘qituvchi bolalarni mustaqil o‘qishga undashi, ularning kognitiv qiziqishini shakllantirishi va bolalarni muammolarni hal qilishning yangi, ahamiyatli usullarini topishga va yaratishga o‘rgatishi zarur. Kreativ o‘qituvchi mavjud stereotirlarni va pedagogik muammolarni hal qilishning umumiy qabul qilingan usullarini ko‘rib shiqishga, sinfda va hayotda turli muammolarni hal qilishga yordam beradigan nostandart kombinatsiyalarni, mahsulotlarni yaratishga intiladi. Bundan kelib chiqadiki, o‘qituvchining kasbiy faoliyati zamonaviy ta’lim jarayonida ijodkorlik elementlarisiz samarali bo‘lmaydi. Bundan tashqari, ijodkorlik qulay psixologik iqlim va bo‘sh vaqtni talab qiladi. Bu zamonaviy o‘qituvchi hal qilishi kerak bo‘lgan kasbiy vazifalarga ham tegishli.

E.E.Shsherbakova konsepsiyasi doirasida kreativ o‘quv jarayoni haqiqiy kreativ salohiyatni rivojlantirish jarayonini va doimiy ravishda o‘z-o‘zini bilishga, kreativ o‘zini o‘zi rivojlantirishga intilish va intilish jarayonini aktuallashtiradi, bu oliy ta’lim tizimining gumanistik yondashuvi paradigmasida asosiy maqsadlardan biri hisoblanadi. A.A.Verbitskiyning g‘oyalariga muvofiq bo‘lajak kadrlarni ta’lim sohasida kreativ tayyorlash ularning amaliy ishlarda keltirilgan usul va shakllarning mazmunini mustahkamlash bilan o‘zlarining kasbiy faoliyatini bajarish va amalga oshirish qobiliyatini anglatadi. K.D.Ushinskiy o‘qituvchilik kasbining murakkab kreativ mazmunini anglashda bu: o‘z ishida turli xil faoliyat turlarini birlashtira oladigan, ta’limning maqsad va vazifalariga alohida qarash bilan, kelajakda pedagogika san’atini o‘zlashtira oladigan iste’dodli va kreativ o‘qituvchi deb tariflaydi. V.A.Slastenin, R.S.Rodymova o‘qituvchining ijodkorligi, kreativ kompetensiyasi va kreativ faoliyatini aniqlashda “kreativlik” innovatsion pedagogik faoliyatning kreativ komronenti sifatida qaraladi, bu amalga oshirilganda o‘qituvchining yangi texnologiyalarni, pedagogik amaliyot shakllarini o‘zgartirish,

o‘zgartirish va yaratish qobiliyatini ko‘rsatadi. O‘qituvchi faoliyatning shablon shakllaridan oddiy foydalanishdan tashqariga shiqishini nazarda tutadi.

O‘qituvchining kreativ shaxsiyati quyidagi ko‘rinishlarda yuqori kasbiy intellektni o‘z ishiga oladi: tashabbuskorlik, kreativ shubhaga moyillik, yangilik hissi, g‘ayrioddiy, bilimga shanqoqlik. O‘qitishda kreativ, kreativ shaxs atrofdagi dunyoni boyitadi, bolalar va talabalarning ijodiy tarkibiy qismini o‘zgartiradi va rivojlantiradi. Umuman olganda, ijodkorlikni samarali yoki kreativ faoliyat deb hisoblash mumkin, ijodkorlik yesa umuminsoniy qobiliyat aynan kreativ faoliyat orqali ijodkor shaxs rivojlanishga undaydi.

Umuman olganda, ijodkorlik shaxsiyatning o‘ziga xos xususiyati bo‘lib, kreativ fikrlash inson hayoti davomida rivojlanishi mumkin bo‘lgan hayotiy mahoratga aylanadi. Ta’lim va kasbiy rivojlanishning bir qismi sifatida ijodkorlik va kreativ fikrlash birinchi navbatda akademik yutuqlarni qo‘llab-quvvatlaydi va kelajakdagi pedagogik iste’dodni kashf yetishga yordam beradi, keyin ijodkorlik xarakterli va kreativ fikrlash mahorat sifatida pedagogik faoliyatning ajralmas vositasiga aylanadi. Faqat kreativ o‘qituvchi o‘qituvchi, o‘qituvchi, murabbiy vazifasini amalga oshirishda o‘zgarishlar va yangiliklarni qabul qilishga qodir. Ijodkorlik turli xil hayotiy vaziyatlarga moslashishga imkon beradi, bu yesa yeski muammolarni hal qilish uchun aniqlash usullari va jarayonlarini tanlashga olib keladi. va zamonaviy muammolarni qabul qilish. Kreativ yondashuvni joriy yetish orqali o‘qituvchi o‘zini samarali deb anglay boshlaydi va bu shaxs uchun asosiy ichki motivlardan biri bo‘lgan kasbdan qoniqish hissini beradi. Bundan tashqari, yaratish va yaratish imkoniyati “o‘qituvchi” kasbida o‘zini o‘zi qadrlash hissi sifatida taqdim yetiladi. Shuni ta’kidlash kerakki, bo‘lajak boshlang‘ish sinf o‘qituvchilari ijodkorlik va kelajakdagi kasbiy faoliyatida ijodkorlikdan foydalanish imkoniyatlari haqidagi bilimlarini tizimli kreativ ko‘nikmalarga aylantirishlari kerak. Buning uchun ijodkorlikdan amalda foydalanishni, kreativ faoliyatni amalga oshirishni va ijodkorlikni sifat sifatida amaliy amalga oshirishda tajriba to‘rlashni talab qilish muhimdir. Faoliyat komronenti o‘qituvchining kasbiy faoliyatida ijodkorlik usullari va texnikasini o‘zlashtirish darajasini, pedagogik vazifalarni hal qilishga kreativ yondashish qobiliyatini belgilaydi. O‘z navbatida, xorijiy paradigmada o‘qituvchilarning kreativ kompetensiyasini tushunishning asosiy masalasi hanuzgacha shaxsiy sifat Tuchunchasi bilan bog‘liq. “ijodkorlik” masalan YE.R.Torranse ijodkorlik ta’rifini o‘qituvchining sinfdagi faoliyatiga muvofiq shakllantirdi, bu quyidagi ma’noga yega:” ijodkorlik deganda ma’lumotdagi muammolar yoki bo‘shliqlarni aniqlash, giroteza g‘oyalarini shakllantirish, ushbu farazlarni sinash va o‘zgartirish va natijalarni uzatish jarayoni tuchuniladi. Bu o‘qitish va o‘rganishda “og‘zaki va og‘zaki bo‘lmagan, aniq va mavhum” ni yaratishda o‘zini namoyon qiladigan samarali jarayon

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GENERAL PHYSICAL PREPARATION METHOD VOLLEYBALL GIRLS

Annotation: *This article explores the methods and importance of physical preparation for female volleyball players, focusing on developing strength, endurance, agility, and coordination to meet the demands of the modern game. The study emphasizes the integration of general and special training exercises tailored to the athletes' physiological characteristics.*

Keywords: *exercise, functional opportunities, physical qualities, downloads, physical preparation, method.*

The actual ministry. To deal with regular exercise, especially in sports games targeted to deal with the health, physical development of their preparation, the mode of action and coordination of the daily requirements of the times, it is important to find at the level of identities.

Very currently make up the majority engaged in volleyball. The results of the analysis conducted the survey the survey, univesitetdagi 85,8% of the hox girls engaged in this sport. The action of the game reflect the real modern volleyball athletes puts high demands on functional skills and opportunities. The comprehensive development of the physical qualities necessary to do this.

Going about physical preparations physical quality of raising the necessary skills and action skills to master the functional capabilities aimed at increasing understanding of the process of teaching. Involved functional capacity and the physical attributes of strength, agility (movement of koordinatsiya), efficiency, durability, elasticity and a high level of skills in the development of action competence plays the main role in the position. The task of psychological and physical preparation to be done at the same time will help in the formation of the quality of irodaviy.

Research methods: questionnaire survey section, pedagogical observation, conversation, mathematical statistics.

The purpose of the research. Choose exercises and physical training them to increase preparedness girls voleybolchi introduction.

Voleybolchi is divided into general and special physical preparation of a part of the process.

General physical preparation of the following tasks:

1. Of health of the overall development of the player's body on the body formation.
2. The basic that you need to Voleybolchi harakat development and improvement of qualifications and skills.

3. Main voleybolchi strengthen the system of the body that falls during the game downloads.

Umumrivojlantiruvchi exercise, walking, running, jumping, review, cast all directed to the development of quality in the review process and exercise more variety snaryad, in-flight exercise, do sports to deal with other types of general physical preparation means.

Special physical preparation tasks are the following:

1. The development of physical qualities that are necessary for the activity of the game.

2. To master the techniques and tactics of the game and physical abilities required for the quality of develop.

The development of the physical qualities necessary for long-term and complex process. Because high-level sport requires physical training. Therefore, the development of the physical qualities proporsional is very important.

Physical preparation tools. Take off on the tasks of physical preparation, as well as various tools: training exercises, harakatli and sports games, educational games and competitions that you can use. Shug'ullanuvchilarning exercises adapted to the individual characteristics of one of the main conditions to be applied is from.

Shug'ullanuvchilar you can add to workout issued for the following:

a) the body, hands, legs affecting the development of the power and efficiency of muscle power exercises;

b) affecting the development of the quality of endurance (efficiency-durability, efficiency-power resistance) exercise;

v) scan, quick order effects which exercise;

g) agility on the quality impact which exercise;

d) elasticity on the quality impact which exercise;

This exercise from the use of technical and tactical methods of performance to the quality of right- right effect will be.

The physical preparation used to style. Students for necessary that the physical qualities of nurturing in the following methods of use.

1. Bazoviy issues bringing up a flat resistant for long-term running

2. Complete the work on nurturing bilateral relations in the changing character of special resistant

3. Repeated exercise method. This method efficiency, power and agility were used in the development of quality and, thus, the chance of full recovery should create the rest of the body care range

4. Space style. Chidamkorlik this style is used mainly in the raising of efficiency and power. Thus, work and rest to get a persistent basis sorted out. The rest to get the range typically large is not.

5. Almashinuvchi exercise methods. This method is muhim side of exercise to go looking at the effect of a target of the directed case is changed. Thus, different hbuy in a different way with nagruzka (movement speed, work hof ajm, duration and hokazaki)of some indicators on mastering (action method navbatlashtirish, as well as, rest take to the range and activity of the external conditions change) way of

by is achieved. Thus, the body's functional reflect the real deals as usual is, that is, tohavea bigger requirements are put , and this with their development for the opportunities it will create. This with along, action forms and conditions are updated to stand due utilized skills of dynamic stereotypes to modifications are introduced, conditional on a reflektor bound moves more nozikroq differensiyalash face lets, as a result, actions, skills further improvement, changing, external additional factors are relatively robust and flexible to be will. Involved physical qualities of nurturing for being granted exercise of their youth characteristics and physical qualitiesng comfortable youth on the period of depending to be chosen and to develop very muchhim is.

It should be remembered that in the game, volleyball girls have to perform multiple jumps, various movements, falls and cross-movements with a ball flying at the same time. And the volume of downloads is very high. Injuries can occur if engaged girls are not prepared to perform such loads.

The distance of sprint running exercises in the development of special endurance of volleyball girls can be up to 200 -300 meters. Downloads are issued in a strictly individualized order. 175 -180 rounds /min until the end of the work of the stroke. be saved. Performance maximum speed 80-85%, rest 45 sec.from 3 min.up to, the number of repetitions is 3-4 times, attempts are 2-3 times, between attempts it is advisable to have a rest period of up to 5 minutes.

Exercises to jump girls in argamchi in training. With the help of some special exercises, it is desirable to develop (on the way) as a game. Jumpiness and endurance not only play the necessary role during the game, but also closely ensure that the technique is performed with agility and changes the place of the volleyball player during the game. In a process in which the game is going, the emergency remains all sorts of moving missions, which require quick and precise thinking of the player as they block and strike.

When assessing girls ' fitness, it is good to use 30 m jogging, jumping long from where they stand, jumping three letters from where they stand, throwing a tennis ball from behind the head to the distance (left hand right foot ahead, right hand left foot ahead)..

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ELEKTR ENERGIYASINI TEJASH VA ZAHIRALARINI BAHOLASHNING UMUMIY USULLARI

Annotatsiya: *Texnologik va tashkiliy omillarning ishlab chiqarishning energiya ko‘rsatkichlariga ta’sirini elektr energiyasini baholashning taklif etilayotgan usullari ularni energiya resurslarini tejash zaxirasiga keng va asosli kiritish imkonini beradi va mavjudlarini takomillashtirish va yaratishga energiya tejovchi yangi jarayonlar va uskunalar yordam beradi. Sanoat korxonalarining yakuniy mahsulotining umumiy elektr quvvatini baholash, shuningdek, materiallar sarfini kamaytirish orqali energiyani tejash uchun zaxiralarni aniqlash energiya ko‘rsatkichlarini Ekspluatatsiya qilish, rejalashtirish va prognozlashda hisobga olinishi kerak.*

Kalit so’zlar: *elektr qurilma*, texnologik asbob-uskunalar*, texnologik asbob-uskunalar, elektr himoya, elektr yuklarining kattaligiga, kuchlanish, texnik xizmat, laboratoriya, energiya tizimi.*

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GENERAL METHODS OF CONSERVING ELECTRICITY AND ASSESSING RESERVES

Annotation: *The proposed methods for assessing the impact of technological and organizational factors on the energy performance of production allow for their broad and reasonable inclusion in the reserve of energy resources and contribute to the improvement of existing ones and the creation of new energy-saving processes and equipment. The assessment of the total electric power of the final product of industrial enterprises, as well as the identification of reserves for energy saving by reducing material consumption, should be taken into account in the operation, planning and forecasting of energy performance indicators.*

Keywords: *electrical equipment, technological equipment, technological equipment, electrical protection, electrical load size, voltage, maintenance, laboratory, energy system.*

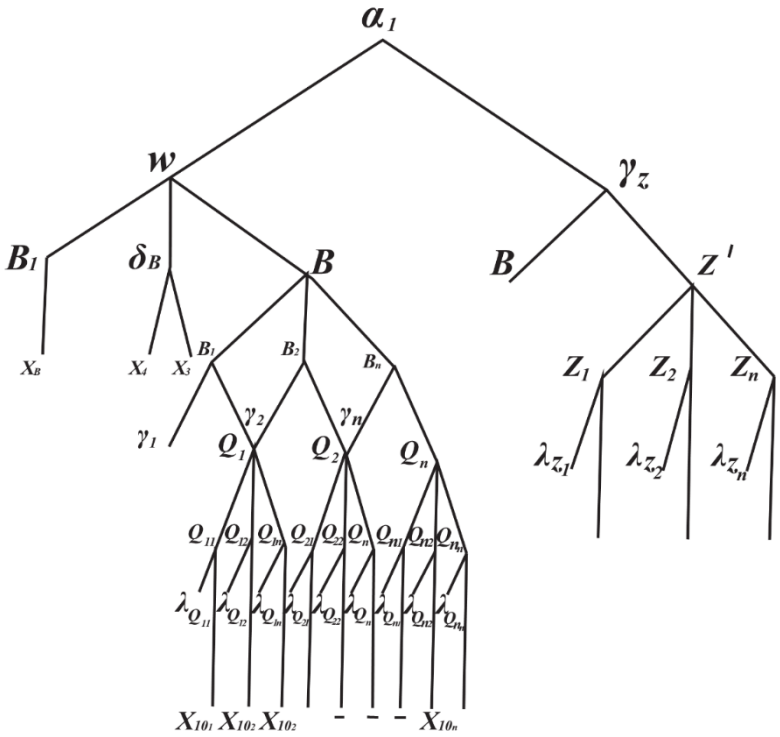
Elektr energetikasi va elektrotexnologik jarayonlarda tizimli tahlil usullaridan foydalangan holda korxonalarning mavjud asbob-uskunalari bo‘yicha olib borilgan ilmiy-tadqiqot va tajriba-sinov ishlarining tajribasi taklif Etilayotgan tavsiyalarning ilmiy asosliligini ta’kidlaydi.

Tadqiqotning asosiy yo’nalishlari quyidagilardan iborat: texnologik asbob-uskunalarning ish rejimini o‘zgartirganda elektr haydovchining elektr yuklarining o‘zgarishi qonuniyatlarini aniqlash; ushbu yuklarni minimallashtirish

imkoniyatlarini aniqlash uchun tegishli matematik modellarni tuzish; energiya, texnologik va Ekologik omillarning elektr yuklarining kattaligiga, mutlaq va xususiy quvvat sarfiga ta'sirini baholashda; juftlik va ko'p bog'lanish tenglamalaridan, shuningdek, grafik-analitik usullardan foydalanish; bundan tashqari, elektrotermik birliklarning konstruktiv xususiyatlariga elektr parametrlarining funktsional bog'liqligini aniqlash bo'yicha ishlar olib borilmoqda; yuqori haroratli pech ichidagi zonada quvvatni Eng foydali taqsimlash usullarini ishlab chiqish; mavjud elektr tarmoqlarida, elektr mashinalari va qurilmalarida elektr energiyasi yo'qotishlarini kamaytirish usullarini ishlab chiqish; kuchlanish darajasini hisobga olgan holda va statik xususiyatlarga muvofiq reaktiv quvvatni ishlab chiqarish va taqsimlashni ratsionalizatsiya qilish; tunu kun ishlaydigan korxonalarning energiya tizimining Eng yuqori soatlarida ishlab chiqarishni kamaytirmagan holda energiya sarfini kamaytirish bilan elektr yuklarini tartibga solishning yangi usullarini ishlab chiqish; korxonalarni iste'molchilar - energiya tizimining yuk regulyatorlari rejimiga o'tkazish yo'llari va vositalarini topish ; ichki va tashqi tarmoqlararo aloqalarni hisobga olgan holda energiya resurslarini tahlil qilish, hisoblash, prognozlash va standartlashtirish algoritmlari va kompyuter dasturlari majmuasini ishlab chiqish; foydalanishdan chiqarilgan uskunalarni energiya tejovchi rejimlarga o'tkazish va yangi istiqbolli mashinalar, mexanizmlar va texnologik jarayonlarni joriy Etishda energiya tejashni rejalashtirish.

Ushbu xususiyatlar, ularning asosiy xizmat ko'rsatish roliga qo'shimcha ravishda, minimal xarajatlarni ta'minlaydigan Eng foydali energiya rejimlarini tanlash va elektr energiyasini iste'mol qilishning ratsionini elektr energiyasini tejash zaxiralarini aniqlash uchun ham qo'llanilishi mumkin. Shu maqsadda quyidagi usullarni taklif qilish mumkin.

Texnologik asbob-uskunalar va texnologik reglamentlarning pasporti va omil ma'lumotlari asosida ishlab chiqarish birligining (tsex, korxona) energiya xususiyatlarini tuzamiz. Dastlabki ma'lumotlar sifatida Ushbu xarakteristikani qurish uchun korxonaning normal ish sharoitida va mashinalar va mexanizmlarning normal holatidagi o'lchovlardan olingan haqiqiy quvvat iste'moli va elektr energiyasini olish kerak.



Keling, energiya tejashning ba’zi misollarini ko‘rib chiqaylik. Ma’lumki, elektr yuklari va alohida birliklar va ishlab chiqarish birliklarining o‘ziga xos elektr iste’moli o‘zgarishining asosiy qonuniyatlari quvvat (D), mutlaq (W) va o‘ziga xos (E) elektr energiyasining funktsiyalari bo‘lgan energiya xususiyatlarini qurish orqali aniqlanishi mumkin. Qayta ishlangan xom ashyo miqdoridan (G) olingan mahsulotlar (P).

Ma’lumki, elektr yukotishlari va alohida birliklar va ishlab chiqarish birliklarining o‘ziga xos elektr iste’moli o‘zgarishining asosiy qonuniyatlari quvvat (S), mutlaq (W) va o‘ziga xos (E) elektr energiyasining funktsiyalari bo‘lgan energiya xususiyatlarini qurish orqali aniqlanishi mumkin. qayta ishlangan xom ashyo miqdoridan (G) olingan mahsulotlar (P).

Shaklda. $W = f(P)$ va $E = f(P)$ Egri chiziqlari elektr energiyasini iste’mol qilishning minimal mumkin bo‘lgan darajasini va texnologik asbob-uskunalarning tarkibi va texnik darajasini hisobga olgan holda hech qanday tarzda kamaytirilishi mumkin bo‘lmagan o‘ziga xos quvvat sarfini ifodalaydi. Bu Erda har bir mahsuldorlik nuqtasi maksimal unumdorlikda ishlaydigan mashinalar, mexanizmlar, dastgohlar, liniyalar va boshqalarning qat’iy belgilangan soniga mos keladi.

Korxonalarni energiya tizimi yukini tartibga soluvchi iste’molchilar rejimiga o‘tkazish yo’llari va vositalarini topish; algoritmlarni ishlab chiqish va tahlil qilish uchun kompyuter dasturlari to‘plami. ichki va tashqi tarmoqlararo aloqalarni hisobga olgan holda energiya standartlarini hisoblash, prognozlash va standartlashtirish; foydalanishdan chiqarilgan uskunalarni energiya tejovchi

rejimlarga o‘tkazish va yangi istiqbolli mashinalar, mexanizmlar va texnologik jarayonlarni joriy Etishda energiya tejashni rejalashtirish.

Ushbu xususiyatlar, ularning asosiy xizmat ko‘rsatish roliga qo‘shimcha ravishda, minimal xarajatlarni ta’minlaydigan Eng foydali energiya rejimlarini tanlash va elektr energiyasini iste’mol qilishning ratsionini elektr energiyasini tejash zaxiralarini aniqlash uchun ham qo‘llanilishi mumkin. Shu maqsadda quyidagi usullarni taklif qilish mumkin. Texnologik asbob-uskunalar va texnologik reglamentlarning pasport va omil ma’lumotlariga asoslanib, biz ishlab chiqarish birligining (sex, korxona) energiya tavsifini quramiz, bu xarakteristikani qurish uchun dastlabki ma’lumotlar sifatida, o‘lchovlar natijasida olingan haqiqiy quvvat sarfi va elektr energiyasi. korxonaning normal ishlashi va normal holati, olinishi kerak mashinalar va mexanizmlar .

Shaklda Kriviv $W = f(P)$ va $E = f(P)$ ikkalasi ham elektr energiyasini iste’mol qilishning minimal mumkin bo‘lgan darajasini va texnologik uskunaning tarkibi va texnik darajasini hisobga olgan holda hech qanday tarzda kamaytirilishi mumkin bo‘lmagan o‘ziga xos quvvat sarfini ifodalaydi. Bu Erda har bir mahsuldorlik nuqtasi maksimal unumdorlikda ishlaydigan mashinalar, mexanizmlar, dastgohlar, liniyalar va boshqalarning qat’iy belgilangan soniga mos keladi.

Elektr energiyasini iste’mol qilishning doimiy komponenti (W_{II}) yoritish, isitish, ventilyatsiya va boshqalar uchun xarajatlarni o‘z ichiga oladi.

Chiqarilgan qiymatdagi amalda mumkin bo‘lgan og’ishlar bilan cheklangan xususiyatlarning ish maydoni uchun.

Haqiqiy ishlab chiqarish ma’lumotlariga asoslanib, matematik statistika usullaridan foydalangan holda energiya iste’molining haqiqiy darajasini aks Ettiruvchi energiya xarakteristikasi kesimini topamiz (a ÷ b , a ÷ b).

Shunday qilib, joriy "K" da energiya tejash zahirasi miqdori ifodadan aniqlanadi

$$\Delta W_{Ek} = (e_k - e)P_k \qquad (1.23)$$

Formuladan foydalangan holda olingan natija ishlab chiqarishni tashkil Etish uchun berilgan ish darajasida energiya tejashning umumiy zaxirasi haqida fikr beradi.

Tabiiyki, ushbu zahirani amalga oshirish uchun elektr energiyasini isrof qiladigan aniq omillarni aniqlash kerak. Shu maqsadda korrelyatsiya va multifaktorial regressiya tahlilidan foydalanish mumkin.

Elektr energiyasini ishlab chiqarish bo‘yicha mutaxassislar ishtirokida tezkor ma’lumotlarni tahlil qilish natijasida ularning sifat ko‘rsatkichlariga asoslanib, elektr energiyasini iste’mol qilish ko‘rsatkichlariga ma’lum ta’sir ko‘rsatishi mumkin bo‘lgan omillarni hisoblash uchun.

Funktsiya sifatida biz ishlab chiqarish birligi uchun o‘ziga xos energiya sarfini olamiz.

Hisoblash natijasida biz bir nechta matematik modelni olamiz

$$e = a + bx_1 + cx_2 + \cdots \ldots + \gamma' x_n \qquad (1.24)$$

Bu Erda x_1 , $x_{2...}$ x_n – Eng muhim standart o‘rnatish omillari, masalan, uskunadan foydalanish darajasi, harorat, namlik va boshqalar.

A . b . c . g – doimiy koeffitsientlar.

Olingan polinom modeli ta’siri ostida energiya iste’moli ortib borayotgan omillarni aniqlash, ularga sifatli baho berish va ularni energiya tejash zaxirasiga kiritish imkonini beradi.

E =f(P) xarakteristikalari yordamida hal qilish mumkin. Shuningdek, birlamchi xom ashyodan foydali mahsulot olinadigan korxonalarda energiya sarfini kamaytirish zahirasini aniqlash va tayyor mahsulot sifati uning xom ashyo tarkibidagi tarkibiga va qazib olish darajasiga (fosforitlar, paxta -ipak va boshqalar) Tabiiyki, foydali mahsulotlar (E) hosildorligining oshishi va uning yo’qotilishining kamayishi energiyani sezilarli darajada tejashga olib kelishi mumkin.

Qayta ishlash birligi uchun o‘ziga xos energiya sarfi Qayta ishlangan xom ashyo quyidagilar bo‘ladi:

$$E_c = \frac{W_d}{C} \tag{1.25}$$

Bu Erda C - qayta ishlangan xom ashyo miqdori. Tayyor mahsulot miqdori bo‘ladi

$$P = \xi\check{G} \tag{1.26}$$

tayyor mahsulot ishlab chiqarish uchun elektr energiyasining solishtirma iste’moli.

$$e = \frac{W}{\xi\check{G}} \tag{1.27}$$

Bir xil hajmdagi xom ashyoni qayta ishlashda elektr energiyasi iste’moli doimiy bo‘lib qoladi va foydali mahsulot tarkibiga va rentabellik koeffitsientiga bog’liq Emas deb hisoblasak ($W_G = W$)

- biz olamiz:

$$e = \frac{1}{E} e_G \tag{1.28}$$

Qiymat (E) to‘g’ridan-to‘g’ri energiya xususiyatlaridan ham olinishi mumkin; *E= f (P)*

E miqdoriga oshishi quyidagi ifodaga muvofiq elektr energiyasining solishtirma iste’moli va energiyani tejashning pasayishiga olib keladi:

$$\Delta e = (\frac{1}{E} - \frac{1}{E+\Delta E}) e_G \tag{1.29}$$

Xom ashyodan foydali mahsulotni olish jarayoni ikki bosqichli jarayon bo‘lgan korxonalar uchun - (dastlabki va to‘liq qayta ishlash) - energiya tejash zaxirasi har bir bosqichda foydali mahsulotlarning rentabellik koeffitsientlari nisbatida yashiringan. Masalan, presslash zavodida urug‘lardan moy olinayotganda yog‘ning bir qismi qobiqda qoladi va jarayonning ikkinchi bosqichida Ekstraktsiya yo’li bilan olinadi. Ikki ishlab chiqarishning har biri uchun solishtirma energiya sarfi qarama-qarshi bo‘ladi, dasgoh uchun Ekstraksiya koeffitsienti o‘zgarishiga bogliq bo‘ladi - oldindan kuyish paytida qazib olish qanchalik yuqori bo‘lsa, o‘ziga xos energiya sarfi shunchalik past bo‘ladi va aksincha - Ekotrationda yuqori bo‘ladi.

Jarayon Eng energiya jihatdan qulay koeffitsient (texnologik reglamentlar doirasida jarayonning ikkala bosqichining ko‘rsatkichlarini hisobga olgan holda grafik-analitik usul bilan olinishi mumkin.

Tayyor mahsulotlarning moddiy zichligini pasaytirish va xom ashyo va yarim tayyor mahsulotlar iste’molining o‘ziga xos ko‘rsatkichlarini oshirish chora-tadbirlarida energiya resurslari va uskunalarni tejashning muhim zaxiralari .

Tabiiyki, bu muammoni hal qilish uchun, o‘z navbatida, ishlatiladigan materiallar, buyumlar va yakuniy mahsulotlarning energiya zichligi haqida aniq tasavvurga Ega bo‘lish kerak va bu har doim ham mumkin Emas.

Gap shundaki, hozirgacha sanoat mahsulotlarining ayrim turlarining energiya sig‘imini baholashda yagona yondashuv mavjud Emas: masalan, to’liq texnologik tsiklga Ega korxonada, shu jumladan birlamchi xom ashyoni qayta ishlashdan tayyor mahsulot ishlab chiqarishgacha bo’lgan jarayonlar. , ishlab chiqarilgan mahsulotlarning to‘liq elektr quvvati hisobga olinadi va aniqlanadi.

Tugallanmagan ishlab chiqarish sikliga Ega bo‘lmagan korxonalarda tegishli korxonalardan tegishli yarim tayyor mahsulotni oladigan profil bo‘lmagan korxonalar, asosan bir xil energiya tarkibiga Ega bo‘lgan tayyor bo‘lmagan mahsulotlar faqat energiya bilan baholanadi. Natijada, xuddi shu mahsulot uchun elektr energiyasining o‘ziga xos iste’moli ko‘rsatkichi sezilarli darajada farq qiladi.

Shu bilan birga, korxona ichidagi energiya intensivligini baholash usuli ham boshqacha. Demak, to’liq ishlab chiqarishga Ega bo’lgan turli tarmoqlar korxonalarini, masalan, ip igirish va gazlama ishlab chiqarishni oladigan bo’lsak, birinchi holatda tayyor mahsulot (paxta)ning energiya sig‘imiga yarim tayyor mahsulot ishlab chiqarish kiradi. Mahsulot - tayyor mahsulotlari qayta ishlangan paxta energiya zichligi yarim tayyor mahsulot ip va gazlama jumladan energiya zichligi hisoblanadi. Bir qator mahsulotlarda ushbu muammoni hal qilishda yagona yondashuvning yoqligi natijasida ma’lum bir mahsulotning energiya intensivligini baholashda sezilarli qiyinchiliklar yuzaga keladi.

Keling, zamonaviy paxtaning umumiy energiya sig’imini baholash usulini ko‘rib chiqaylik va uni ishlab chiqarishda bir qator korxonalar, shu jumladan boshqa tarmoqlar ham uning alohida bosqichlarida ishtirok Etadi. Qabul qilamiz -Q- yakuniy mahsulot ishlab chiqarish uchun zarur bo‘lgan xom ashyo, yarim tayyor mahsulotlar va materiallarni qabul qilish va ishlab chiqarish bilan shugullanadigan sanoat tarmoqlarining umumiy soni - Z. Ushbu sohalarning har biri tomonidan ishlab chiqarilgan mahsulotlar miqdori tegishli ravishda belgilanadi -

Umumiy elektr quvvati quyidagicha bo‘ladi:

$$E_n = \sum_1^n \sum_1^k E_i \gamma_Z + e \qquad (1.30)$$

Bu Erda *m* - xom ashyo, materiallar, yarim tayyor mahsulotlar turlarining soni. yakuniy mahsulot ishlab chiqarish uchun korxonaga kirish.

E_i - yakuniy mahsulot ishlab chiqarishga jalb qilingan *i* - *ishlab chiqarishni* ishlab chiqarish uchun elektr energiyasining solishtirma iste’moli . $\gamma_{Zi} = \frac{Q}{Z}$ yakuniy mahsulot birligiga *i* - oraliq mahsulotning solishtirma sarfi yakuniy mahsulot ishlab chiqaruvchi korxonada solishtirma energiya sarfi miqdori.

Tayyor mahsulot ishlab chiqarish uchun xom ashyo, materiallar va yarim tayyor mahsulotlar tannarxini kamaytirish Engil sanoat faoliyatida energiya resurslaridan oqilona foydalanish bo'yicha juda muhim yo'nalish hisoblanadi. Ushbu xarajatlar, hozirgi vaqtda, odatda, elektr energiyasini hisoblashda hisobga olinmaydi. Shu bilan birga, ular har bir ishlab chiqarishning barcha ko'p texnologik bosqichlarida elektr energiyasini iste'mol qilishda hal qiluvchi ahamiyatga Ega.

Tabiiyki, energiya iste'moli darajasi ham xom ashyo sifatiga, ham texnologik asbob-uskunalar va jarayonning texnik sifatiga bog'liq bo'ladi.

Bir tonna tayyor mahsulot olish uchun zarur Ekanligini hisobga olsak ayrim hollarda ishlab chiqarishni tashkil Etish Etarli darajada bo'lmagan o'nlab tonna xom ashyo va materiallarni qayta ishlash uchun ortiqcha yo'qotishlarga va shunga mos ravishda ortiqcha energiya sarfiga yo'l qo'yilishi mumkin.

Bularning barchasini hisobga olish elektr energiyasini normalash bo'yicha ishlarning mazmunini yangi sifat darajasiga ko'tarish imkonini beradi.

Taklif Etilayotgan usulning mohiyati shundan iboratki, xomashyoning o'ziga xos xarajatlari to'g'ridan-to'g'ri har bir ishlab chiqarish birligi va umuman korxonaning solishtirma energiya iste'moli uchun hisoblash formulalariga kiritiladi. Shu bilan birga, xom ashyo, materiallar va energiya ko'rsatkichlari kompleksini optimallashtirish natijasida energiyani tejash uchun zaxiralar aniqlanadi.

Yakuniy mahsulotni ishlatishda ΔZ qiymatiga tejash natijasida energiya tejash miqdori quyidagicha bo'ladi :

$$W_{EK} = E\Delta Z \qquad (1.31)$$

Bizning misolimizda, fermada bir tonna tejalgan ammofosni tomizish 5000 kVt/soatdan ortiq energiya tejash imkonini beradi. Keyinchalik, biz material iste'molining tayyor mahsulotning mikro sig'imiga ta'sirini baholash usulini ko'rib chiqamiz va ushbu ko'rsatkichni kamaytirishdan energiya tejash zaxirasining hajmini aniqlashimiz mumkin. *n ta* ustaxonada material sarfini kamaytirishda umuman korxona uchun energiyani tejash quyidagicha bo'ladi:

$$W_{EK} = \sum_1^n [\alpha_i - (d_i \pm \Delta d_i)(q_i - \Delta q_i)]Z \qquad (1.32)$$

Bu yuqoridagilardan kelib chiqadi. Texnologik va tashkiliy omillarning ishlab chiqarishning energiya ko'rsatkichlariga ta'sirini elektr energiyasini baholashning taklif Etilayotgan usullari ularni energiya resurslarini tejash zaxirasiga keng va asosli kiritish imkonini beradi va mavjudlarini takomillashtirish va yaratishga energiya tejovchi yangi jarayonlar va uskunalar yordam beradi. Sanoat korxonalarining yakuniy mahsulotining umumiy elektr quvvatini baholash, shuningdek, materiallar sarfini kamaytirish orqali energiyani tejash uchun zaxiralarni aniqlash energiya ko'rsatkichlarini Ekspluatatsiya qilish, rejalashtirish va prognozlashda hisobga olinishi kerak.

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TA'LIM JARAYONIDA INTEGRATSIYA VA INTEGRATIV YONDASHUVNI JORIY ETISH ZARURATI

Annotatsiya: *Integrativ yondashuvning mazmun - mohiyati va ta'lim tizimida undan faydalanishning hozirgi vaqtdagi zarurati ushbu maqolada yoritib berilgan. Ta'lim sifatini oshirish va o'qitishning maqsadi hamda omillarini bir butunligini ta'minlashda integratsiyalashning ahamiyati izohlab berilgan.*

Kalit so'zlar: *o'qitish, ta'lim, intetratsiya, integrativ yondashuv, samaradorlik, modelli integratsiya, sistemali integratsiya, innovatsion texnologiya.*

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THE NEED TO IMPLEMENT INTEGRATION AND INTEGRATIVE APPROACH IN THE EDUCATIONAL PROCESS

Abstract: *The essence of the integrative approach and the current need for its use in the education system are highlighted in this article. The importance of integration in improving the quality of education and ensuring the integrity of the goals and factors of education is explained.*

Key words: *teaching, education, integration, integrative approach, efficiency, model integration, systemic integration, innovative technology.*

Zamonaviy pedagogik yondashuvlarga asoslangan ta'lim jarayonida integrativ yondashuvni joriy etish zaruratiga ta'limning har bir bosqichida ehtiyoj sezilmoqda. «Integratsiya» termini ilmiy atama sifatida pedagogikaga 1980-yillarining birinchi yarmida shakllandi va jadal sur'atlarda ijtimoiy hayotga, iqtisod, siyosat, axborot va boshqa sohalarda tadbiq etila boshlandi. 1990-yillarga kelib esa ta'limda «integratsiyalash» tushunchasi paydo bo'ldi.

Mamlakatimizni 2022-2026-yillarga mo'ljallangan yangi O'zbekistonning taraqqiyot strategiyasida ta'lim tizimiga oid vazifalar belgilab berilgan. Jumladan, nufuzli xalqaro ilmiy markazlar va oliy ta'lim muassasalari bilan birgalikda ilm-fan va amaliyot integratsiyasini chuqurlashtirish bo'yicha fikrlar bildirilgan.

Ta'lim mazmunidagi uyg'unliklarni ta'minlash muammolari ham integratsiyalashning shug'ullanadigan sohasi hisoblanadi. Ta'lim va tarbiyada esa bilimlar, tushunchalar, ko'nikmalar va malakalarni shakllantirishlarni umumlashtirib, qonun yoki qoida ko'rinishiga keltirishni amalga oshiradi. Ta'lim jarayonini integratsiyalash – o'qitishning maqsadi va omillarini bir butun qilib

birlashtirishdir. Bunda ta’lim mazmunini tashkil etuvchi elementlar: bilim, ko‘nikma, malaka, me’yor, pedagogik tizimlarni o‘zida mujassamlab bilimlarni tizimlashtirishni tashkil etish, talabalarda texnik, texnologik jarayonlarda sodir bo‘ladigan hodisalar, tushunchalar, g‘oyalar, nazariyalar orasidagi o‘zaro integratsiya va har tomonlama bog‘lanish borligini tushuna olish ko‘nikmalarini shakllantirish; bu bog‘lanishlar ilmiy va kasbiy bilimlarni chuqurlashtirishga yordam beruvchi ekanini tushuntirishni ta’minlash; o‘quvchilarda ijodkorlik masalalarini nazariy jihatdan to‘g‘ri va amaliy jihatdan maqsadga muvofiq yechishda, turli o‘quv predmetlarini o‘rganishda olgan bilim va malakalari asosida texnikaviy – iqtisodiy, ijtimoiy – ekologik, tashkiliy – pedagogik tizimlar maqsadi, mezoni va vazifasini to‘g‘ri shakllantirish ko‘nikmalarini hosil qilishlarini nazarda tutadi.

Har bir davrda ta’lim jarayonida integrativ yondashuvni joriy etish zarurati yuzaga kelgan. Xususan, o‘quv jarayoniga ta’limning interfaol shakllari, texnologiyalari – integrativ dars, talabani tanqidiy fikrlashga undovchi metodlar jadal rivojlanmoqda. Ta’limning globallashuviga erishish orqali talabalarni birgalikda o‘qitish maqsadiga xizmat qiladigan integrallashgan ta’limni tashkil qilish ishlari amalga oshirilmoqda. Integrallashgan kasblar paydo bo‘layotganligi bo‘lajak o‘qituvchilarning kasbiy kompetentligini rivojlantirishda integratsiyalashgan ta’limning o‘rni va ahamiyatini oshirmoqda.

Dunyo miqyosida ta’lim sifati va samaradorligini oshirishda o‘qitishning integratsiyalashuviga, kompleks yondashuvni tatbiq etishga qaratilgan bir qator ilmiy izlanishlar hamda ilmiy tadqiqotlar olib borilmoqda. L.S.Vigotskiy tomonidan ilgari surilgan konstruktivistik nazariyalar bu yondashuvni asoslaydi. Uning ta’kidlashicha, talabalar o‘zlarining bilimlarini atrof-muhit bilan o‘zaro ta’sir qilish va tengdoshlari bilan hamkorlik qilish orqali qurishadi [1]. Ushbu yondashuv an’anaviy modelga qarshi o‘laroq ko‘proq talabaga asoslangan yondashuviga e’tibor qaratadi. Masalan, geografiya fani misolida mashg‘ulotda talabalar ma’ruzalarni passiv tinglashdan ko‘ra ularning ilmiy tushunchalarni o‘rganish uchun amaliy tajribalar va guruh muhokamalarida qatnashishi yaxshi natijalarni beradi.

L.T.Ahmedovaning fikricha, integratsiyalashgan dars bu - darsning muayyan va o‘ziga xos shakli bo‘lib, u nafaqat turli fanlardan olingan ma’lumotlarni birlashtiradi, balki vaqtni ham tejaydi [2].

Integrativ yondashuv asosida ta’lim beruvchi dastlabki institut California Institute of Integral Studies AQShning Kaliforniya shtatida 1968 yilda tashkil topgan. O‘tgan o‘n yil ichida AQShda Ken Vilberning integrativ instituti ham yuzaga keldi. Ispaniyaning Madrid shahridagi R.Y.Karlos universitetida integrativ ta’lim asosida ta’lim berila boshlandi [3].

Integratsiyalashgan ta’lim, avvalo, bir-biriga yaqin va mos bo‘lgan o‘quv fanlarini yaqinlashtirish, yaxlitlash va kompleks holda o‘qitishni ko‘zda tutadi. Ta’lim mazmunini integratsiyalashtirish pedagog uchun ham ta’lim oluvchi uchun ham katta ahamiyat kasb etadi, ta’lim sifatini oshirish, ta’lim oluvchining faoliyatini yaxshilash, faollashtirish, bilimlarini mustahkamlash, ularda kuchli motivatsiyani

uyg‘otish va o‘z-o‘zini rivojlantirishda muhim omillardan biri hisoblanadi. Integrativ yondashuv – axborotlarni tashkil qiluvchi cheksiz ko‘p kichik qismlarning o‘zaro ajralmas bog‘liqligi, ularning yaxlitligi, bir butunligi asosida yagona to‘g‘ri xulosani aniqlash jarayonidir. Bu yondashuv o‘rganilayotgan bilimlarning didaktik tizimi chuqur mazmunga ega bo‘lishi, bilimlarga tizimli yondashish, o‘quvchilar bilimlarini egallashning eng maqsadga muvofiq yo‘llarini o‘rgatishdan iborat.

Integrativ yondashuv ta’lim-tarbiya jarayonlariga kompleks va tizimli yondashuv hisoblanib, tizimiy tahlil tadqiqot metodlarini joriy etishda va bilishning induksiya hamda deduktsiya metodlaridan foydalanishda qo‘l keladi. Integrativ yondashuv ta’lim va tarbiyani iyerarxik tizim sifatida qarab, ular ustida olib boriladigan tadqiqotlarning samaradorligini kafolatlaydi [4].

Zamonaviy ilmiy metodologik rivojlanish har bir fanda o‘zaro aloqalar integratsiyasining zaruratini yuzaga keltirmoqda. Ayni paytda fanlardagi differensiatsiya jarayonlari bilan bir qatorda ilmiy ma’lumotlarning sintezi va integratsiyasiga bo‘lgan ehtiyojni ham kuchaytirdi. Integratsiya jarayoni geografiya faniga yangicha qarashni taqoza etadi, yangi paradigmalarni qidirish zaruriyatini keltirib chiqaradi. Geografiyaning o‘zida kechgan integratsiya jarayonlari natijasida tabiiy va sotsial-iqtisodiy geografiyani bog‘lab turadigan integrativ yo‘nalishlar (meliorativ geografiya, rekreatsion geografiya, tabiatdan foydalanish geografiyasi va b.). vujudga keldi [6].

R.V.Konchakovskiy integratsiyani 4 ta asosiy darajaga ajratadi: sistemali, modelli, kompleksli va analitik. Uning fikricha, sistemali integratsiya ikki fanning birlashuviga asoslanadi va yangi ilmiy jarayonda yangi fanning vujudga kelishiga sabab bo‘ladi. Modelli integratsiya esa funksional va strukturali modellarning boshqa fanlar bilan birlashishiga asoslanadi. Kompleksli integratsiyada turli ijtimoiy fanlarni bir vaqtning o‘zida kompleks tavsiflash va ularni o‘qitishning turli darajalari o‘rtasidagi o‘zaro bog‘liqligi bilan ifodalanadi. Analitik integratsiya ilmiy ma’lumotlar asosida tegishli sohalarda erishilgan yutuqlarni tahlil qilish, ularning ijtimoiy hayotga ta’sirini o‘rganish va ulardan amaliy foydalanishga asoslanadi [4].

L.P.Elinkon ham maktab ta’limini integratsiyalashning muhimligini ta’kidlab, «integratsiya darslarni samarali tashkil qilish vositasi, predmetlar orasidagi aloqalarni yangi pog‘onalarga ko‘tarish shakli» deb hisoblaydi [5].

Zamonaviy pedagogik yondashuvlar o‘rganish tajribasini oshirish uchun texnologiyadan foydalanadi. Aralashtirilgan ta’lim, o‘zgaruvchan sinflar va onlayn resurslar talabalarga ta’lim mazmuniga moslashuvchanlikni ta’minlaydi. Ta’lim texnologiyasi individual ehtiyoj va imtiyozlarga moslashtirilgan shaxsiylashtirilgan ta’lim tajribasini yaratishga imkon beradi [6].

Integrativ yondashuvda turli fanlardan olingan bilimlar, ko‘nikma, malaka va tajribani hisobga olish, ularga tayanish, ya’ni chet tilda kommunikativ, kasbiy, ijtimoiy kompetentlikni integratsiyalash, barobar rivojlantirishni nazarda tutadi. Ushbu yondashuv talabalarda erkin muloqot qilish kompetensiyasini rivojlantirishga qaratilgan yangi innovatsion texnologiyalarni qo‘llash, talabalarda mustaqil va jamoa bo‘lib ishlash ko‘nikmalarini shakllantiradi. Mazkur yondashuv

ta’lim sifatining sezilarli ravishda ijobiy tomonga o‘zgarishiga va talabalarning til o‘rganishga bo‘lgan motivatsiyalari kuchayishiga olib keldi.

Integrativ yondashuv zamonaviy va samarali ta’lim tamoyillaridan biri bo‘lib, ta’lim oluvchilarda ko‘p qirrali tasvir va dunyoqarashni shakllantiradi, ularni yangicha fikrlash va mulohaza yuritishga undaydi, bilimlarni oson va tez o‘zlashtirishga imkon yaratadi va motivatsiya uyg‘otadi, fanlardan olgan bilimlarini amaliyotda erkin qo‘llash imkoniyatini yaratish bilan birga dunyoni yaxlit anglashga, tizimlarning o‘zaro bog‘liqlikda ekanligi haqidagi tasavvurni shakllantiradi.

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IMPROVEMENT OF THE METHODOLOGY OF ECOLOGICAL-GEOGRAPHICAL ASSESSMENT OF LAND FUND

Abstract: *The article presents information on the current state of land resources, including the categories and types of land resources, assessment of the ecological and economic state, and general assessment, along with the opinions of many scientists about the land fund. In addition, this study presents theoretical aspects such as mapping the results of the assessment, as well as how to zone them.*

Keywords: *Natural resource, policy, land resource, soil, territory, lalmikor, obikor, historical and cultural monument, reserve land, forest fund land, cadastre, heavy industry, light industry, natural reserves, ecological park, cartographic reherence*

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YER FONDINI EKOLOGIK-GEOGRAFIK BAHOLASH METODIKASINI TAKOMILLASHTIRISH

Annotasiya: *Maqolada hozirgi davrda ko'plab olimlar tomonidan yer fondi haqidagi fikrlar bilan birgalikda, yer fondi toifa va turlari, ekologik-xo'jalik holatini baholash, umumiy baholash singari malumotlar keltirilgan. Undan tashqari mazkur tadqiqot davomida baholash natijalarini xaritalashtirish, shu bilan bir qatorida ularni qay tartibda rayonlashtirish singari nazariy jihatlari yoritib keltirilgan.*

Kalit so'zlar: *Tabiiy resurs, siyosat, yer resursi, tuproq, hudud, lalmikor, obikor, tarixiy-madaniy yodgorlik, zahira er, o'rmon fondi er, kadastr, og'ir sanoat, yengil sanoat, tabiiy rezervar, ekologik bog', kartografik ishora*

Kirish. O‘zbekiston Respublikasida so‘ngi yillarda olib borilayotgan ijtimoiy-iqtisodiy islohotlarning muvaffaqiyati, aholi turmush farovonligini oshirish, iqtisodiyotning barqaror holatini ta'minlash natijalari qishloq xo‘jaligining rivojlanish darajasiga uzviy bog‘liq. Mazkur so‘zlarning yaqqol tasdiqi sifatida O‘zbekiston Respublikasi Prezidenti Sh.M.Mirziyoevning “O‘zbekiston Respublikasini yanada rivojlantirish bo‘yicha Harakatlar strategiyasi to‘g‘risida”gi 2017 yil 7 fevralda imzolagan Farmonida “Iqtisodiyotni rivojlantirish va liberallashtirishning ustuvor yo‘nalishlari” ning uchinchi bo‘limi “Qishloq xo‘jaligini modernizasiya qilish va jadal rivojlantirish”[1] deb nomlanishi qishloq xo‘jaligiga mamlakatimizda jiddiy e'tibor qaratganidan dalolat beradi.

Shundan kelib chiqib barcha sohalarda bo‘lgani kabi geografiya faniga mamlakatimizning mustaqillikga erishganidan so‘ng e'tibor kuchaytirilib, tadqiqotlarni olib borish ishlariga sharoitlar yanada yaxshilandi. Aristotelning yer resurslari haqidagi fikrlari asosan uning tabiiy fanlar va iqtisodiyotga oid nazariyalariga asoslanadi. U yer resurslarini, jumladan, qishloq xo‘jaligi, mineral boyliklar va boshqa tabiiy resurslar bilan bog‘liq masalalarni o‘rganishga harakat qilgan.

Bu sohadagi yutuqlar zamirida yer resurslaridan oqilona foydalanish yotadi. Shu bois, respublikada amalga oshirilayotgan ijtimoiy-iqtisodiy islohotlarda yer munosabatlarini takomillashtirish, yer resurslaridan oqilona foydalanish va uni muhofaza qilish alohida ahamiyat kasb etadi. Mamlakatimizda qabul qilingan «yer kodeksi» (2012) yer resurslaridan oqilona, samarali foydalanish, qishloq xo‘jaligida mulkchilikning turli shakllarini rivojlantirishga asos bo‘lib xizmat qilmoqda.

- Mavzuga doir adabiyotlar tahlili (Litereture review). Mamlakatimizda ko‘plab tadqiqotchilar yer fondidan foydalanishni takomillashtirish bo‘yicha ekologik-geografik masalalarni o‘rgangan. Jumladan, Dokuchaev(1951), Minsk A.A,(1972), Zamkov O.K.(1978), Zvorkin K.V.(1984), Tolipov G.A.(1994), Yu.G.Saushkin(2001), Jumaev T.J.(2004), V.A.Pulyarkin (2000), Kochurov B.I. (2009), Yu.I.Ahmadaliev (2014) kabi tadqiqotchilar o‘z ishlarida dunyodagi va mamlakatimiz yer fondidan foydalanishni takomillashtirish bo‘yicha o‘z tavsiyalarini berib, bir qator ishlar amalga oshirilgan.

- Tadqiqot metadologiyasi (Research Methodology). Dunyodagi yer resurslarini barcha olimlar o‘z tadqiq etgan hududdan kelib chiqgan holda, qishloq xo‘jaligi, tuproqlar sifat jihatdan o‘zgarishi, yer fondi turlari singari turli tarmoqlarini o‘rganib o‘z taklif va mulohazalar qilishgan. Mazkur olimlar qatorida, Dokuchaev, B.I,Kochurov, V.A.Pulyarkinlar tomonidan taklif etilgan usullardan foydalanilmoqda. Mamlakatimizdagi geograf olimlar ham yer resurslariga doir ko‘plab ilmiy izlanishlar olib brogan. Mazkur olimlar qatorida V.G.Kryuchkov, A.M. Nosonov, Kaluskov V.N. O‘zbekistonlik olimlandan A.A.Abdulqosimov, L.A.Alibekov, A.Raxmatullaev, A.O‘razbaev, S.B.Abbosov A.Maqsudov, A.A.Rafiqov, Yu.Shadametov, T.Djumaev, A.N.Nigmatov, B.Kamolov, K.Boymirzaev, Yu.I.Ahmadaliev O.Abdug‘aniev, F.Yuldashev, R.Qo‘ziev, D.Mo‘minov, N.Alimdjonov singari olimlar tadqiqotlarida taklif etilgan usullardan foydalanilsa maqsadga muvofiq.

Yuqoridagi mamlakatimiz olimlari tomonidan olib borilayotgan izlanishlar natijasida yer fondidan foydalanishni takomillashtirish bo‘yicha quyidagi tomonlari o‘rganib borilmoqda: Barqaror rivojlanishning yer resurslari bilan bog‘liq ilmiy-nazariy asoslarini ochib berish;

Yer fondi landshaft tarkibi va uning o‘zgarish darajasi bo‘yicha ekologik gomogen guruxlarga ajratish uslubini takomillashtirish va nazariy-uslubiy asoslarini takomillashtirish;

Qishloq joylarida geoekologik-xo‘jalik muvozanatni tabiatdan foydalanishning tabiiy-tarixiy, tovar-maqsadli va dastur-maqsadli turlarida (zamonda) o‘zgarish jarayonini tahlil etish;

Hududini nisbiy ekologik zo‘riqish koeffisentini, yer fondiga tushadigan xususiy antropogen yuk miqdorini aniqlash, rayonlashtirib, kartalashtirish, geoekologik vaziyatni takomillashtirishning asosiy tadbirlarini amalga oshirishning landshaftli dasturini tavsiya etish singari boshqa ko‘plab ilmiz ishlar amalga oshirilmoqda.

-Tahlil va natijalar (Analysis and results). Yer fondini ekologik-geografik baholashni takomillashtirishga doir ilmiy izlanishlar qadimdanoq o‘rganila boshlangan. Dastlabki yer resurslarini tadqiq etgan insonlardan Aristotel bo‘lib u yer resurslariga oid ba'zi asosiy g‘oyalaridan biri keltirilgan: “Qishloq xo‘jaligi va tabiiy resurslar Aristotel qishloq xo‘jaligini inson hayoti uchun muhim deb hisoblagan. U Yerning unumdorligini, tuproqni ishlatish va ekinlarni parvarish qilishning ahamiyatini ta'kidlagan. Uning fikricha, yaxshi tuproq va iqlim sharoitlari qishloq xo‘jaligi mahsulotlarining sifatiga va hosildorligiga ta'sir qiladi”. Umuman olganda, Aristotelning yer resurslari haqidagi qarashlari uning tabiatga bo‘lgan e'tibori, iqtisodiy faoliyatni tushunishi va ijtimoiy adolatni ta'minlashga bo‘lgan intilishlari bilan bog‘liqdir. Uning fikrlari keyinchalik iqtisodiyot va ekologiya sohalarida o‘zgarishlarga sabab bo‘lgan.

Rossiyalik geograf Yu.G.Saushkin ta'kidlab o‘tganidek “Bir ijtimoiy tuzumdan boshqasiga o‘tish eski tuzumdagi ishlab chiqarish va noishlabchiqarish tarmoqlarining joylanishiga ta'sir etmasa-da, ular o‘rtasidagi munosabat va aloqalarni o‘zgartiradi, bu esa oqibat natijada ularni hududiy tashkil etishning o‘zgarishiga olib keladi” [10].

Ilmiy tadqiqot ishlari bilan shug‘ullanish davomida jamiyat hayotini uchun dolzarb bo‘lgan ilmiy takliflar olib kirish, yangicha yondashishlar nafaqat vatanimizda balki, dunyoning bir qator rivojlangan mamlakatlarda sodir bo‘layotganini ko‘rishimiz mumkin. Izlanishlarni yangicha yondashishlar sababi, hozrgi keskinlashib borayotgan va ekologik muammolar yuzaga kelayotganini hisobga olgan holda, o‘sha paytlardayoq barqaror rivojlanish yo‘li tanlanganligi ham aytish mumkin. Jamiyatda yuz berayotgan o‘zgarishlar yer resurslariga ham ta'sir qilmay qolmayapti. Shuning natijasida erdan foydalanishni hududiy tashkil qilishni zamon talabidan kelib chiqib, yangidan-yangi usullari yaratishni va bu usullar avvalo atrof muhitga kam zarar keltirilishi lozimligi asosiy maqsad qilib olinmoqda.

Zamonaviy ilmiy va maxsus adabiyotlarda insonlarning "tuproq", "yer", "yer resurslari" "yer fondi" va "hudud" tushunchalari yanada chuqurroq tadqiq etilib, keng qo‘llanilayapti. Yuqoridagi, tushunchalar bir-biriga yaqin bo‘lsa-da, ularning mazmuni, ma'nosi, ko‘lami va qo‘llanishi mumkin bo‘lgan o‘rinlari turlichadir.

Yer resurslaridan foydalanishda tuproq o‘rni beqiyosdir. Tuproq litosfera yuza qavatlarining suv, havo va tirik organizmlar ta'sirida o‘zgarishidan shakllanadigan va genetik jihatdan o‘zaro bog‘liq gorizontlardan tashkil topgan tabiiy tuzilma; yer po‘stining yuza va unumdor qatlami. Tuproq haqida hozirgacha juda ko‘plab olimlar ta'rif berishgan, lakin bu tariflardan eng maqbuli B.B.Dokuchaevning quyidagicha tarifidir: “tuproq - iqlim, organizmlar, grunt, mahalliy relyef va o‘lkaning yoshi kabi omillarning birgalikdagi faoliyati ta'sirida paydo bo‘ladigan tabiiy-tarixiy hosiladir" (Dokuchaev, 1951). Tuproqning tarkibida quyidagilar mavjud: tuproq mikroorganizmlari, chuvalchanglar, mollyuskalar, hasharotlar vakillaridan hamda yerni o‘yuvchi umurtqalilardan tashkil topgan. Biz tuproqga quyidagicha ta'rif beramiz: “tuproq o‘simliklar o‘sishi, rivojlanishi, uchun zarur, unumdorlik xususiyatiga ega bo‘lgan, ona jinsi, mikroorganizmlar, chuvalchanglar, mollyuskalar, hasharotlardan tashkil topgan iqlimiy, relyef va quyosh nuri kabi omillar ta'sirida vujudga keladigan murakkab tabiiy hosilani” aytish mumkin.

Yer resurslari “qishloq xo‘jaligi uchun foydalanish mumkin bo‘lgan yerlar” hisoblanadi. yer resurslari tushunchasini ko‘plab olimlar tomonidan ilmiy adabiyotlarda ta'riflar berilgan (Minsk A.A, 1972; Zamkov O.K., 1978; Zvorkin K.V, 1984; Tolipov G.A, 1994; Jumaev T.J, 2004; Yu.Ahmadaliev, 2014). Jumladan mazkur ta'riflarni ichida eng maqbullardan biri Yu.Ahmadaliev tomonidan berilgannidir:» yer resursi bu - yer fondining tarkibiy qismi bo‘lib, u o‘ziga xos tuproq sifati, iqlim, relyef, gidrogeologik xususiyatlari bilan tavsiflanadi, jamiyatning muayyan rivojlanish bosqichida undan asosan zarur mahsulotlar etishtirishda va boshqa maqsadlarda foydalaniladi” [4]

Yer fondi mamlakatning jami yer resurslari maydoni hisoblanadi va barcha foydalaniladigan bir nechta toifalar bo‘yicha izlanishlar olib boriladi. Yerlarni toifalarga bo‘lish va bir toifadan boshqasiga o‘tkazish. Yerlar asosiy foydalanish maqsadiga qarab yer fondi toifalariga bo‘linadi. Bu yer fondi turlari har bir mamlakatda yoki mintaqada farq qilishi mumkin, chunki ularning ta'rifi va tasnifi mahalliy qonunlarga va an'analariga bog‘liq.

Yer fondining toifalari va turlari uning turli foydalanish maqsadlariga qarab farqlanadi. Har bir toifa va tur o‘ziga xos xususiyatlarga ega bo‘lib, ularni boshqarish va rivojlantirishda muhim ahamiyatga ega. Barqaror rivojlanish va ekologik muvozanatni saqlash uchun bu toifalar va turlarni to‘g‘ri boshqarish zarurdir. Biz tadqiqot ishimizni bevosita qishloq xo‘jaligidagi yerlariga chambarchas bog‘liq hisoblanadi. Qishloq xo‘jaligi ehtiyojlari uchun berib qo‘yilgan yoki ana shu maqsadlar uchun belgilangan yerlar qishloq xo‘jaligiga mo‘ljallangan yerlar hisoblanadi. Qishloq xo‘jaligiga mo‘ljallangan yerlar qishloq xo‘jaligini yuritish uchun zarur bo‘lgan qishloq xo‘jaligi yerlari va daraxtzorlar,

ichki xo‘jalik yo‘llari, kommunikasiyalar, o‘rmonlar, yopiq suv havzalari, binolar, imoratlar va inshootlar egallagan yerlarga ajraladi. Haydaladigan yerlar, pichanzorlar, yaylovlar, tashlandiq yerlar, ko‘p yillik dov-daraxtlar (bog‘lar, tokzorlar, tutzorlar, mevali daraxt ko‘chatzorlari, mevazorlar va boshqalar) egallagan yerlar qishloq xo‘jaligi yerlari jumlasiga kiradi. qishloq xo‘jaligi yerlari maxsus muhofaza qilinishi lozim. Qishloq xo‘jaligiga mo‘ljallangan yerlarni qishloq xo‘jaligidan o‘zga ehtiyojlar uchun boshqa toifadagi yerlarga o‘tkazishga alohida hollarda ushbu kodeks va boshqa qonun hujjatlariga muvofiq yo‘l qo‘yiladi.

Dunyo miqyosida tadqiq etgan olimlardan V.A.Pulyarkinning ta'kidlashicha “mustamlaka sharoitiga tushib qolgan mamlakatlarda erdan foydalanish sohasida yuz beradigan birinchi jarayon tovar ekinlarni kiritilishi va bu hududlar iqtisodiyotini metropoliya davlatlarining agrar xom-ashyo quyrug‘iga aylanib qolishidir”[11].

Mazkur mustamlaka tuzim asoratlari dunyodagi ko‘plab davlatlarda bo‘lgani singari bizning mamlakatimizni ham chetlab o‘tgani yo‘q.

SSSR Minstrlar Soveti Komunistik Partiyasi Markaziy Komitetida Paxta etishtirishni oshirish uchun O‘zbekiston SSSR va Qozog‘iston SSSR dashtlaridagi qo‘riq yerlarni o‘zlashtirish va sug‘orish haqida 1956-yil 6-avgustdagi qarori haqida quyidagi olimlar fikr bildirishadi: A.I.Chistobaev va M.D.Shariginlar (1990.127 b.)

Adabiyotlarda qayd etilishicha, 1961 yildan orol dengizining suv sathi pasaya boshladi (Problemi... 1969). Ko‘plab olimlar Orolni ham, Kaspiy va baykal ko‘llari kabi qutqarish kerak, degan fikrlarga ko‘ra, O‘rta Osiyo geografiyasini “bilimdoni” deya ta'riflashadigan olim C.Yu.Geller shunday deb javob yozadi: “ Orol dengizini qurishda uni Kaspiyga qiyoslash maqsadga muofiq emas, chunki suvdan foydalanishdan keladigan iqtisodiy samara turlicha qolaversa, daryo suvi butunlaysug‘orishga ishlatilsa, Orolning baliqchiligidan 100 marta ko‘p foyda olish mumkin” (Problem,1969, 7 b).

2015-yilda Rossiyada Farg‘ona vodiysi sug‘oriladigan yerlarni o‘rganish buyicha A.N.Nikonorova Dissertasiya yoqlab, u “Sug‘oriladigan yerlarda suvni tejashning "ichki" zaxiralarini baholash Farg‘ona vodiysi omillari va sharoitlarini aniqladi”. Demak, vodiy hozirda ham chet davlatdagi olimlarni o‘ziga jalb qilmoqda.

Baholash natijalarini xaritalashtirish tadqiqot usullaridan baholash jihatdan eng tushnarli va ko‘zga yaqqol tashlanadigan kartografik metod baholash jarayonida tadqiqot jarayoni usullaridan biri hisoblanadi. (Kartografik metodi o‘rganilayotgan hududiy komplekslarni va komponentlarni haritalashtirish va xaritalarni tahlil etish metodi). Mazkur usulda foydalanishda rus olimlaridan S. E. Salnikov (1993) tomonidan amalga oshirilgan.

Пролетарии всех стран, соединяйтесь!

Коммунистическая партия Советского Союза

ПРАВДА

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СЕГОДНЯ В НОМЕРЕ:

ГОЛОДНАЯ СТЕПЬ СТАНЕТ ДОЛИНОЙ ПЛОДОРОДИЯ

В Центральном Комитете КПСС и Совете Министров СССР

Об орошении и освоении целинных земель Голодной степи в Узбекской ССР и Казахской ССР для увеличения производства хлопка

Беседа товарищей Н. А. БУЛГАНИНА и Н. С. ХРУЩЕВА с Министром иностранных дел Японии г-ном Мамору СИГЕМИЦУ

1- rasim. “Pravda” gazetasi 1956.09.11. №224.

Yuqoridagi baholash haqidagi ayrim ma'lumotlar muayyan hudud erdan foydalanishning mavjud holatiga iqtisodiy georafik, geoekologik nuqtai-nazardan ishonchli ilmiy «tashxis» qo‘yishga hamda yer resurslaridan oqilona foydalanishni hududiy tashkil etishni takomillashtirishga ko‘maklashadi.

Baholash natijalarini xaritalashtirish — bu ma'lumotlarni vizual ko‘rinishda taqdim etish jarayoni bo‘lib, u ko‘pincha geografik yoki statistik xaritalar yordamida amalga oshiriladi. Bu jarayon, odatda, quyidagi bosqichlarni o‘z ichiga oladi:

1. Ma'lumotlarni yig‘ish; 2. Ma'lumotlarni tayyorlash; 3. Xaritani tanlash: 4. Vizualizasiya; 5. Tahlil va sharhlash; 6. Taqdimot;

Baholash natijalarini xaritalashtirish jarayoni, ma'lumotlarni yanada tushunarli va qiziqarli qilishga yordam beradi, shuningdek, qaror qabul qilish jarayonida muhim vosita sifatida xizmat qiladi.

Kartografik metod- tadqiq etilyotgan hududni so‘ngi yillardagi (5, 10, 15, 20 .. yillardagi) geografik o‘rinda, relyefda, havoda, tabiatida sodir bo‘layotgan barcha jarayonlarni kuzatish natijasida Aerokosmonavtik moslamalar yordamida olingan sur'atini sinchiklab o‘rgangan holda geografik qobiqdagi tadqiq etilayotgan tegishli bo‘lgan qismini xaritaga tushiriladigan va tahlil qilish metodi hisoblanadi.

Kartografik imzo tizimini takomillashtirish, to‘g‘ridan-to‘g‘ri idrok qilish, fazoviy tahlil va umumlashtirish uchun xaritalarning ko‘rinishi va ulardan foydalanish imkoniyatlarini yaxshilash natijasida erishilgan yuqori ma'lumot sig‘imi (ma'lumotlarning "siqilish darajasi") ilmiy va amaliy tadqiqotlar jarayonida kartografik usulni ajralmas holga keltiradi [13].

Kartografik usul yordamida hududning tashqi qiyofasi tasvirlanayotganda berilayotgan elementlar soni qancha koʻp boʻlsa xarita shuncha yuzaroq tasvirlanadi. Agar xaritada berilayotgan elementlar soni qancha kam va chuquqrroq berilsa tadqiqot ishini shuncha aniq yorita oladi. Kartalarni mavzular boʻyicha guruhlash bilan bir qatorda, ya'ni kartalar turlarini ajratish bilan bir qatorda, kartalarning turlarini ham hisobga olish kerak. Umumiy qabul qilingan tasnifga koʻra, xarita turlari sub'ektlarning kengligi, kartografik hodisalarni oʻrganish usullari, ob'ektivlik darajasi va amaliy yoʻnalishi bilan ajralib turadi [8]

Kartografik ishoralar tizimini takomillashtirish, toʻgʻridan-toʻgʻri idrok etish, fazoviy tahlil va umumlashtirish uchun xaritalarning koʻrinishi va ulardan foydalanish imkoniyatlarini yaxshilash orqali erishilgan kartografik materiallarning yuqori ma'lumot sigʻimi (ma'lumotlarning "siqilish darajasi") ilmiy va amaliy tadqiqotlar jarayonida kartografik usulni ajralmas holga keltiradi [9]

Yer fondi baholash natijalarini xaritalashtirish — bu yer resurslarining holatini va foydalanishini vizual tarzda aks ettirish jarayonidir. Bu jarayon, yer fondining turli jihatlarini (masalan, tuproq unumdorligi, ifloslanish darajasi, suv resurslari va boshqalar) xaritalar orqali koʻrsatish imkonini beradi.

Natijalarni rayonlashtirishda tadqiqod ishning maqsadidan kelib chiqqan holda, ajratilgan landshaft asosidagi yer turlaridan kelib chiqib turli rayonlashtirish oʻtkaziladi. Hududni erdan foydalanishning tarixiy va mahalliy xuxuxiyatlarini tahlil qilish, toʻplangan malaka, koʻnikma va tajribalarini baholash uchun dastlab tarixiy geografik rayonlashtirish oʻtkaziladi. Tabiiy omillarni hisobga olgan holda hududni rayonlashtirish kerak. Rayonlashtirishda tabiiy va iqtisodiy-ijtimoiy xususiyatlarni inobatga olgan holda guruhlarga ajratish mumkin. Masalan : tabiiy geografik xususiyatlarga geomorfologik-geologik tuzulishi, iqlimi, relyefi, oʻsimlik va hayvonot dunyosi, tuproqlari va boshqa omillarni hisobga olgan holda rayonlashtiriladi.

Olimlardan B.B.Proxorov (1998) tomonidan aniqlangan antropoekologik rayonlashtirish hududni inson ekologiyasi nuqtai nazaridan oʻrganish uchun muhim usul hisoblanadi: hududlarni yashash sharoitlariga, demografik xulq-atvorga va aholi salomatligiga ta'sir koʻrsatadigan belgilar boʻyicha taqsimlash.

Rayonlashtirish jarayoni yer fondi baholash natijalarini aniqroq tushunishga yordam beradi va resurslardan samarali foydalanishni ta'minlaydi. Bu jarayon orqali har bir rayonning oʻziga xos xususiyatlari va muammolari aniqlanadi, bu esa barqaror rivojlanish va ekologik xavfsizlikni ta'minlashda muhim ahamiyatga ega.

Xulosa va takliflar (Conclusion/Recommendations). Yer fondini ekologik-geografik baholash metodikasini takomillashtirish, ekologik barqarorlikni ta'minlash va resurslardan samarali foydalanishni oshirish uchun muhimdir. Quyida bu jarayonda e'tiborga olish kerak boʻlgan ba'zi asosiy jihatlar keltirilgan: 1. Ma'lumotlarni yigʻish va tahlil qilish (Geoinformasion tizimlar, Uzoqdan zondlash); 2. Ekologik indikatorlar (Indikatorlarni tanlash, Indikatorlarning integrasiyasi); 3. Model va prognozlar (Matematik modellar, senariy tahlili); 4. Barqaror rivojlanish strategiyalari (Resurslardan foydalanish, Mahalliy aholi ishtirokini ta'minlash); 5. Monitoring va baholash (Davriy monitoring, natijalarni baholash); 6. Ta'lim va

axborot (O‘qitish dasturlari, axborot almashinuvi); 7. Integrasiya (Multidisiplinar yondashuv,) ekologiya, geografiya, iqtisodiyot va boshqa sohalarni birlashtirib, kompleks baholash tizimini yaratish;

Ushbu jihatlar yer fondini ekologik-geografik baholash metodikasini yanada takomillashtirishga yordam beradi va barqaror rivojlanishni ta'minlashga xizmat qiladi.

Yer fondini ekologik-geografik baholash metodikasini takomillashtirish uchun zamonaviy texnologiyalarni, multidisiplinar yondashuvlarni va barqaror rivojlanish tamoyillarini qo‘llash zarurligi ko‘rinadi. Bu esa nafaqat yer resurslaridan samarali foydalanishni ta'minlaydi, balki atrof-muhitni muhofaza qilishga ham xizmat qiladi. Geografik rayonlashtirish mavzusi geografiya, iqtisodiyot va ekologiya sohalarida muhim ahamiyatga ega. Ushbu jarayonning asosiy maqsadi hududlarni ularning tabiiy, iqtisodiy va ijtimoiy xususiyatlariga ko‘ra tasniflash va boshqarishdir. Quyidagilar geografik rayonlashtirishning ahamiyati va uning asosiy jihatlarini yoritadi:

1. Hududiy taqsimot; 2. Iqtisodiy samaradorlik; 3. Ekologik muvozanat; 4. Ijtimoiy rivojlanish; 5. Mahalliy xususiyatlar; 6. Monitoring va tahlil; 7. Barqaror rivojlanish:

Yuqoridagilar geografik rayonlashtirishning ahamiyatini va uning turli sohalarga ta'sirini ko‘rsatadi. Ushbu jarayonni takomillashtirish orqali hududlarning barqaror rivojlanishini ta'minlash va resurslardan samarali foydalanishni oshirishni inobatga ekologik-geografik baholashning ahamiyati va asosiy jihatlari sifatida quyidagilarni taklif sifatida aytish mumkin: 1. Ekologik holatni aniqlashda ekologik geografik baholash orqali hududning ekologik holati, tabiiy resurslar va ularning taqsimoti haqida aniq ma'lumotlar to‘plash va ma'lumotlar atrof-muhitni boshqarishda muhim ahamiyatga egaligi o’rganilishi lozim. 2. Baholash jarayoni inson faoliyatining tabiiy muhitga ta'sirini o‘rganish bu orqali antropogen omillar, masalan, sanoat, qishloq xo‘jaligi va shaharsozlikning ekologik oqibatlari aniqlash mumkin. 3. Ekologik geografik baholash natijalari barqaror rivojlanish strategiyalarini ishlab chiqishda asos bo‘ladi. Bu jarayon orqali resurslardan oqilona foydalanish va atrof-muhitni muhofaza qilish choralarini belgilash mumkin. 4. Baholash jarayoni ekologik xavf-xatarlarni, masalan, ifloslanish, iqlim o‘zgarishi va tabiiy ofatlar kabi muammolarni aniqlashga yordam beradi. U holda oldini olish choralarini ko‘rishga imkon beradi. 5. Ekologik geografik baholash ijtimoiy-iqtisodiy omillarni ham hisobga oladi, u aholi ehtiyojlari va resurslardan foydalanishni muvozanatlash imkonini beradi. 6. Har bir hududning o‘ziga xos ekologik sharoitlari va mahalliy xususiyatlarini inobatga olish zarur. Bu mahalliy aholi uchun qulay sharoitlar yaratishga xizmat qiladi. 7. Ekologik geografik baholash doimiy monitoring va nazorat bo’lishi kerak. Bu jarayon orqali hududlarning ekologik holati va rivojlanish dinamikasini kuzatish mumkin. 8. Ekologik geografik baholash jarayoni orqali aholi va mutaxassislarga atrof-muhit muhofazasi va barqaror rivojlanish haqida ma'lumot berish imkoniyati yaratiladi, bu esa ekologik xabardorlikni oshiradi. Ekologik-geografik baholash ahamiyatini

va uning turli sohalarga ta'sirini koʻrsatadi. Ushbu jarayonni takomillashtirish orqali atrof-muhitni muhofaza qilish va barqaror rivojlanishni ta'minlash mumkin.

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XALQ TA’LIMI TIZIMIDA TA’LIM SIFATINI BAHOLASH BO‘YICHA XALQARO TADQIQOTLARNI (PISA, TIMSS, PIRLS, TALIS) JORIY ETISHNING ME’YORIY-HUQUQIY ASOSLARI

Annotatsiya: *Bugungi globallashuv davrida ta’lim sifatini ko‘tarilishi har qanday davlat taraqqiyotining asosiy ko‘rsatkichlaridan biridir. Ta’lim sifatini yaxshilanib borishishini domiy nazorat qilib borish bu tizimdagi muommo va kamchiliklarni aniqlashtirish va zaruriy choralarni qo‘llash imkonini beradi.*

Kalit so’zlar: *Globallashuv, standart, xalqaro baholash tadqiqotlari, professional faoliyatini, muommo, zamonaviy, qonuniy, me’yoriy asoslar*

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REGULATORY AND LEGAL FRAMEWORK FOR THE IMPLEMENTATION OF INTERNATIONAL STUDIES (PISA, TIMSS, PIRLS, TALIS) IN ASSESSING THE QUALITY OF EDUCATION IN THE PUBLIC EDUCATION SYSTEM

Annotation*: In today's era of globalization, the rise in the quality of education is one of the main indicators of the development of any state. Domicile control over the improvement of the quality of Education makes it possible to clarify the treatment and shortcomings of this system and apply the necessary measures.*

Key words*: Globalization, Standard, International Assessment studies, professional activities, treatment, modern, legal, regulatory framework.*

Ta’lim sifati har qanday davlat taraqqiyotining asosiy ko‘rsatkichlaridan biridir. Bugungi globallashuv davrida ta’lim tizimining rivojlanishi nafaqat ichki baholash mezonlariga, balki xalqaro standartlarga ham mos bo‘lishi zarur. Shu nuqtai nazardan, xalqaro baholash dasturlari – PISA (Programme for International Student Assessment), TIMSS (Trends in International Mathematics and Science Study), PIRLS (Progress in International Reading Literacy Study) va TALIS (Teaching and Learning International Survey) – o‘quvchilarning bilim, ko‘nikma va kompetensiyalarini chuqur tahlil qilishga, o‘qituvchilarning professional faoliyatini baholashga xizmat qilmoqda.. Xalqaro baholash dasturlari – PISA, TIMSS, PIRLS va TALIS – bu talim sifati va tizim samaradorligini o‘lchashda eng muhim vositalardan hisoblanadi. Mazkur tadqiqotlar o‘quvchilarning bilim darajasini, o‘qituvchilarning kasbiy mahoratini va ta’lim muhitining sifatini baholashga qaratilgan bo‘lib, ularning natijalari ta’lim tizimini takomillashtirish uchun muhim ma’lumotlar manbai hisoblanadi. O‘zbekiston Respublikasi ta’lim tizimida mazkur tadqiqotlarni joriy etish, ularning huquqiy va me’yoriy asoslarini yaratish orqali xalq ta’limini yanada isloh qilish yo‘lida muhim qadamlardan biridir.

O‘zbekiston Respublikasi ham ushbu xalqaro baholash tizimlarida ishtirok etishni davlat siyosati darajasiga ko‘tardi. Mamlakatimizda ushbu tadqiqotlarni joriy etish bo‘yicha qator normativ-huquqiy hujjatlar qabul qilindi, institutsional baza yaratildi va xalqaro tajribani o‘zlashtirish bo‘yicha izchil ishlar olib borilmoqda.

PISA – 15 yoshli o‘quvchilarning o‘qish, matematika va tabiiy fanlar bo‘yicha funksional savodxonligini baholaydi. PISAning asosiy maqsadi – o‘quvchilarning o‘rganilgan bilimlarini real hayotiy vaziyatlarda qo‘llash qobiliyatini aniqlashdir. Har uch yilda bir marta OECD (Iqtisodiy hamkorlik va taraqqiyot tashkiloti) tomonidan o‘tkaziladi.

TIMSS – 4- va 8-sinflar o‘quvchilarining matematika va tabiiy fanlardan bilim darajasini o‘lchashga yo‘naltirilgan. Bu tadqiqot orqali fanga qiziqish, darsliklar sifati, o‘qituvchilarning malakasi va ta’lim muhiti haqida batafsil ma’lumot to‘planadi.

PIRLS – boshlang‘ich sinf (odatda 4-sinf) o‘quvchilarining matnni o‘qish va tushunish darajasini baholaydi. Bu tadqiqot orqali bolalarning nutqiy savodxonligi va matn bilan ishlash qobiliyati aniqlanadi.

TALIS – maktab o‘qituvchilari va rahbarlari orasida o‘tkaziladigan so‘rovnoma bo‘lib, u ta’lim muhitini, o‘qituvchilarning kasbiy rivojlanishini, mehnat sharoitlarini o‘rganishga qaratilgan.

O‘zbekiston Respublikasi xalqaro baholash tadqiqotlariga ilk bor 2018–2019 yillarda faol tayyorgarlik ko‘rishni boshladi. 2019-yilda O‘zbekiston TIMSS va PIRLS tadqiqotlarida ishtirok etdi. 2022-yilda PISA sinov baholashida qatnashdi va 2025-yilda PISAning to‘liq baholash bosqichiga qo‘shilishni rejalashtirmoqda.

Bu jarayonni muvofiqlashtirish uchun 2021-yilda Ta’lim sifatini baholash milliy markazi (TSBMM) tashkil etildi. Mazkur markaz xalqaro baholash dasturlarini rejalashtirish, tadqiqotlarni o‘tkazish, natijalarni tahlil qilish va ulardan amaliy foydalanishni ta’minlash bilan shug‘ullanadi.

Ushbu xalqaro tadqiqotlar doirasida o‘quv dasturlarining zamonaviylashtirilishi, o‘quvchilarning mustaqil fikrlashini rag‘batlantirish, kompetensiyalarga asoslangan yondashuvni joriy etish bo‘yicha strategiyalar ishlab chiqilmoqda.

Xalqaro baholash tadqiqotlarini joriy etish va ularga tayyorgarlik ko‘rish jarayonida quyidagi asosiy huquqiy-me’yoriy hujjatlar qabul qilindi:

• O‘zbekiston Respublikasi Prezidentining 2018-yil 5-sentabrdagi PQ-3931-son qarori – Xalq ta’limi tizimini tubdan isloh qilish chora-tadbirlari haqida. Ushbu qaror xalqaro baholash tizimlarini joriy etish zaruratini belgilab berdi.

• “Ta’lim to‘g‘risida”gi Qonun (2020-yil, yangi tahrirda) – bu qonunda ta’lim sifatini baholash, xalqaro tadqiqotlarda ishtirok etish, baholashning ochiqligi va oshkoraligi kabi asosiy prinsiplar mustahkamlangan.

• Vazirlar Mahkamasining 2021-yil 24-martdagi 154-son qarori – Ta’lim sifatini baholash milliy markazi faoliyatini tashkil etish haqida. Ushbu qarorda markazning vakolatlari, funksiyalari va tashkiliy tuzilmasi aniq belgilab qo‘yilgan.

• 2022–2026 yillarga mo‘ljallangan “Yangi O‘zbekistonning taraqqiyot strategiyasida xalqaro baholash tadqiqotlarida ishtirok etish va ularning natijalariga tayangan holda ta’lim mazmunini takomillashtirish davlat siyosati darajasiga ko‘tarilgan.

Xulosa qilib aytganda, xalq ta’limi tizimida ta’lim sifatini baholash bo‘yicha xalqaro tadqiqotlarni joriy etishning me’yoriy-huquqiy asoslari O‘zbekiston Respublikasi Konstitutsiyasi, qonunlari, Prezident farmonlari va qarorlari, Vazirlar Mahkamasining qarorlari, xalqaro shartnomalar va boshqa normativ-huquqiy hujjatlar bilan mustahkamlab qo‘yilgan. Biroq, bu jarayonning muvaffaqiyatli amalga oshirilishi uchun qonunchilik bazasini takomillashtirish, moliya ta’minotini kuchaytirish, kadrlar salohiyatini oshirish va jamiyatning xabardorligini oshirish zarur. Ta’lim sohasidagi islohotlarni xalqaro standartlarga moslashtirish, xalqaro tajribani o‘rganish va ilg‘or metodikalarni joriy etish orqali O‘zbekiston ta’lim tizimini sifat jihatidan yangi bosqichga ko‘tarish mumkin. Bu esa, o‘z navbatida, mamlakatning barqaror rivojlanishi, iqtisodiy o‘sishi va madaniy yuksalishiga xizmat qiladi.

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BOYSUN TUMANI DEMOGRAFIK HOLATI, MUAMMOLARI VA ISTIQBOLLARI

Annotatsiya: *Mazkur ilmiy ishda Boysun tumanining 2024–2025-yillardagi demografik ko‘rsatkichlari tahlil qilingan. Aholi soni, tug‘ilish va o‘lim koeffitsientlari, tabiiy o‘sish dinamikasi hamda nikoh-ajrimlar statistikasi o‘rganilgan. Migratsiya jarayonlari va ularning ijtimoiy ta’siri yoritilgan. Demografik o‘zgarishlarning tuman rivojiga ta’siri tahlil qilingan. Tadqiqot rasmiy statistik ma’lumotlar asosida amalga oshirilgan.*

Kalit so‘zi: *Aholi, demografik harakat, tug‘ulish, o‘lim, migratsiya, migratsiya saldosi.*

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DEMOCRAPHIC SITUATION, PROBLEMS, AND PROSPECTS OF BOYSUN DISTRICT

Annotation:*This scientific work analyzes the demographic indicators of the Boysun district for the years 2024–2025. It studies the population size, birth and death rates, natural growth dynamics, and the statistics of marriages and divorces. Migration processes and their social impact are highlighted. The influence of demographic changes on the district's development is analyzed. The study is based on official statistical data*

Keywords: *Population, demographic movement, birth, death, migration, net migration.*

Kirish. Demografik jarayonlar har qanday hududning ijtimoiy-iqtisodiy rivojlanishida muhim omil hisoblanadi. Aholi soni, tarkibi, tabiiy harakat ko‘rsatkichlari, migratsiya holati bevosita iqtisodiy faollik, mehnat resurslari va ijtimoiy xizmatlar tizimiga ta’sir ko‘rsatadi. O‘zbekiston Respublikasi uchun har bir tuman va hududning demografik ko‘rsatkichlarini aniqlash, ularni ilmiy tahlil qilish asosida tegishli strategik qarorlar qabul qilish dolzarb vazifadir[1,4].

Surxondaryo viloyatining tog‘li hududlaridan biri bo‘lgan Boysun tumani o‘zining tarixiy, madaniy va tabiiy salohiyatidan tashqari, ijtimoiy-demografik jarayonlar dinamikasi bilan ham alohida e’tibor talab etadi. Ushbu ilmiy maqolada tumanning 2024-yil yakuniga oid demografik holati statistik ma’lumotlar asosida tahlil qilinadi, mavjud muammolar ochib beriladi va istiqboldagi demografik rivojlanish yo‘nalishlariga doir takliflar ilgari suriladi.

Tadqiqot metodologiyasi. Boysun tumanining demografik holati, mavjud muammolari va demografik rivojlanish istiqbollarini o‘rganish jarayonida kompleks, tizimli va zamonaviy ilmiy-uslubiy yondashuvlar asosida tadqiqot olib borildi. Ushbu metodologik asoslar demografik jarayonlarni chuqur o‘rganish, muammolarni aniqlash va ularni bartaraf etish yo‘llarini ishlab chiqishga xizmat qiladi.

Tahlil va natijalar. 2025-yil 1-yanvar holatiga ko‘ra, Boysun tumanining doimiy aholisi 127,1 ming kishini tashkil etgan. Bu raqam 2024-yil boshiga nisbatan 2,5 ming kishiga (2,0%) ko‘p bo‘lib, aholi sonining ijobiy o‘sish sur’atini ifodalaydi.

Aholining jinsiy tarkibi ham muvozanatli ko‘rinishda bo‘lib, erkaklar ulushi 51,2%, ayollar ulushi esa 48,8% ni tashkil etadi. Bu esa, o‘z navbatida, mehnat resurslarini shakllantirishda muhim omil bo‘lib xizmat qiladi[9].

2024-yil davomida tumanda 3 512 ta tug‘ilish holati qayd etilgan bo‘lib, bu ko‘rsatkich 2023-yilga nisbatan 90 taga kamaygan. Tug‘ilish koeffitsienti esa 27,9 promilleni tashkil etgan (2023-yilda 29,2 promille). Shuningdek, 2024-yilda 576 ta o‘lim holati qayd etilgan bo‘lib, bu 2023-yilga nisbatan 30 taga kamaygan (2023-yilda 606 ta).

O‘lim koeffitsienti 4,6 promille bo‘lib, o‘tgan yilga qaraganda 0,3 promillega pastlagan. Bu esa sog‘liqni saqlash tizimidagi yutuqlar, profilaktika choralari va aholining yashash darajasi o‘zgarishiga bog‘liq bo‘lishi mumkin.

2024-yil yakunida tumanning tabiiy o‘sish ko‘rsatkichi 2 936 kishini tashkil etdi, bu 2023-yildagi 2 996 kishiga nisbatan 60 kishiga kamaygan. Bu tendensiya tug‘ilish sur’atining pasayishi va o‘lim darajasining nisbiy barqarorligi bilan izohlanadi. Umuman olganda, tabiiy o‘sish mavjud bo‘lsa-da, uning sur’atida pasayish kuzatilmoqda[8].

Nikoh va ajralishlar jamiyatdagi ijtimoiy muhit, oilaviy qadriyatlar va iqtisodiy sharoitlarning o‘ziga xos ko‘rsatkichidir. 2024-yil davomida FHDYO organlarida 965 ta nikoh va 110 ta ajralish holati qayd etilgan. Har ming aholiga to‘g‘ri keluvchi nikoh koeffitsienti 7,7 promille (2023-yilda 8,6), ajralishlar esa 0,9 promille (2023-yilda 1,0 promille) ni tashkil etgan.

Bu raqamlar nikohlar sonida biroz kamayish, ajralishlarda esa nisbiy barqarorlikni ko‘rsatmoqda. Nikohlar sonining kamayishi yoshlar orasida oilaviy hayotga kirishish yoshi ortib borayotgani, ijtimoiy-iqtisodiy barqarorlikka bog‘liqligini bildirishi mumkin.

2024-yil davomida Boysun tumanida ko‘chib kelganlar soni 338 kishini, ko‘chib ketganlar esa 794 kishini tashkil etdi. Natijada, migratsiya saldosi –456 kishini tashkil etib, 2023-yildagi saldodan (–362 kishi) ham yomonroq natijani ko‘rsatdi. Bu esa, asosan, ishsizlik, ijtimoiy infratuzilmaning yetarli emasligi yoki yaxshi yashash sharoitini izlash kabi omillar bilan bog‘liq bo‘lishi mumkin[7].

Migratsiya saldosi salbiy bo‘lgan hududlarda aholi soni tabiiy o‘sish hisobiga oshgan bo‘lsa-da, uzoq muddatda bu aholi tarkibining o‘zgarishiga, mehnat resurslarining kamayishiga olib keladi. Shu bois, migratsiyani boshqarish, ayniqsa yoshlar orasida mahalliy bandlikni ta’minlash siyosati muhimdir[3,5,6].

Boysun tumanining 2024-yil bo‘yicha demografik ko‘rsatkichlari shuni ko‘rsatadiki, aholining tabiiy o‘sishi barqaror bo‘lsa-da, tug‘ilish darajasida pasayish, migratsiya ko‘rsatkichlarida esa salbiy holat saqlanib qolmoqda. Aholi sonining umumiy o‘sishi ijobiy bo‘lsa-da, bu o‘sishning barqarorligini ta’minlash uchun quyidagi takliflar muhim deb hisoblanadi:

- tug‘ilish sur’atini barqarorlashtirish uchun ijtimoiy qo‘llab-quvvatlov choralarini kuchaytirish zarur: tug‘ruqdan keyingi yordam, yosh oilalarga subsidiyalar, bolalar bog‘chasi va tibbiyot xizmatlarini kengaytirish;
- migratsiyani kamaytirish uchun tumandagi ish o‘rinlarini ko‘paytirish, yoshlar uchun kasb-hunar o‘rganish markazlarini ochish, tadbirkorlikni qo‘llab-quvvatlash dasturlarini amalga oshirish lozim;
- nikohlar sonini barqarorlashtirish va ajralishlarni kamaytirish maqsadida ijtimoiy-psixologik maslahat markazlarini yo‘lga qo‘yish, yoshlar orasida oilaviy hayot madaniyatini targ‘ib qilish muhimdir;
- tibbiyot xizmatlarini takomillashtirish orqali o‘lim ko‘rsatkichini yanada pasaytirish, sog‘lom turmush tarzini targ‘ib qilish zarur;
- demografik monitoringni yaxshilash, raqamli statistik tizimlar orqali demografik jarayonlarni real vaqtda kuzatish va tahlil qilish imkoniyatlarini yaratish lozim.

Xulosa

Xulosa qilib aytganda, Boysun tumanining demografik holati ijobiy jihatlar bilan birga, ehtiyotkorlik bilan tahlil etilishi lozim bo‘lgan muammoli tomonlarga ham ega. Tabiiy o‘sish sur’atini saqlab qolish, migratsiya oqimini ijobiy tomonga o‘zgartirish, oilaviy barqarorlikni ta’minlash orqali ushbu tumanning barqaror demografik taraqqiyotiga erishish mumkin. Davlat va mahalliy boshqaruv organlarining hamkorlikda olib boradigan siyosati ayni shu yo‘nalishlarga qaratilishi zarur.

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BOYSUN TUMANI QISHLOQ XO‘JALIGINING SALOHIYAT DARAJASI

Annotatsiya: *Ushbu maqolada Boysun tumanining iqtisodiy salohiyatida qishloq xo‘jaligining, xususan chorvachilik va dehqonchilik tarmoqlarining o‘rni tahlil qilingan. 2024-yil statistikasi asosida ishlab chiqarish hajmlari, xo‘jaliklar toifalari va ularning iqtisodiy ta’siri yoritilgan. Shuningdek, o‘rmon xo‘jaligi va baliqchilikning hozirgi holati va istiqbollari baholangan. Tadqiqot natijasida tuman iqtisodiyotini rivojlantirish uchun takliflar ishlab chiqilgan.*

Kalit so‘z: *Boysun tumani, chorvachilik, dehqonchilik, o‘rmon xo‘jaligi, dehqon xo‘jaligi, tomorqa, zamonaviy yondashuvlar.*

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THE POTENTIAL LEVEL OF AGRICULTURE IN BOYSUN DISTRICT

Abstract: *This article analyzes the role of agriculture, in particular livestock and farming, in the economic potential of the Boysun district. Based on statistics for 2024, production volumes, categories of farms and their economic impact are covered. The current state and prospects of forestry and fisheries are also assessed.*

As a result of the study, proposals have been developed for the development of the district's economy.

Keywords: *Boysun district, livestock, farming, forestry, peasant farming, homestead, modern approaches.*

Kirish. Boysun tumani Surxondaryo viloyatining shimoliy, tog‘li hududida joylashgan bo‘lib, o‘zining tabiiy geografik xususiyatlari, agroiqlimiy sharoiti va tarixiy-iqtisodiy rivojlanish bosqichlari bilan ajralib turadi. Mavjud geografik holat va tabiiy resurslar tuman iqtisodiyotining muhim tarmoqlaridan biri sifatida qishloq xo‘jaligini ajratib ko‘rsatishga asos bo‘ladi. Tadqiqot davomida Boysun tumanining 2024-yil bo‘yicha rasmiy statistik ko‘rsatkichlari asosida amalga oshirilgan chuqur tahlil shuni ko‘rsatmoqdaki, qishloq xo‘jaligi tumanning asosiy iqtisodiy tayanch tarmog‘i bo‘lib qolmoqda.

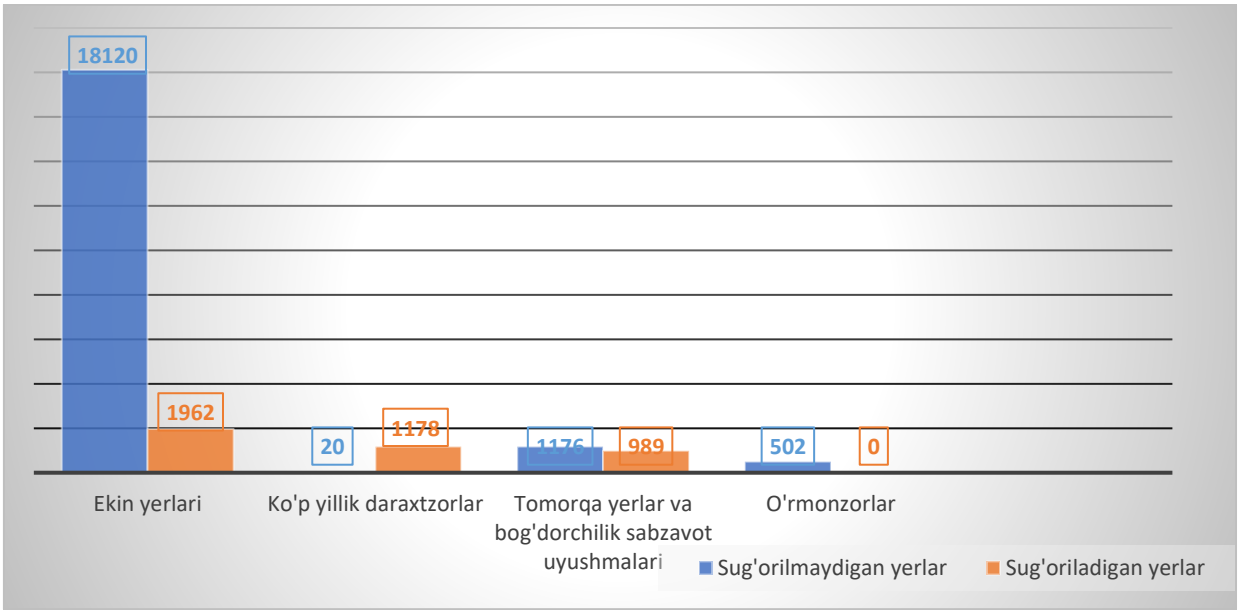
Tadqiqot metodologiyasi. Boysun tumanining qishloq xo‘jaligi salohiyat darajasini o‘rganish uchun kompleks va tizimli yondashuv asosida turli ilmiy-uslubiy metodlardan foydalanildi. Tadqiqotning asosiy maqsadi — tumandagi tabiiy-geografik sharoitlar, yer resurslari, mehnat resurslari, iqlim omillari, agrotexnik imkoniyatlar va ishlab chiqarish tizimi orqali qishloq xo‘jaligining mavjud salohiyatini baholash va uning rivojlanish imkoniyatlarini aniqlashdan iboratdir.

Tahlil va natijalar. 2024-yilda qishloq, o‘rmon va baliqchilik xo‘jaligi mahsulotlari umumiy hajmi 1 749,7 milliard so‘mni tashkil etib, 2023-yilga nisbatan 103,6 foizga o‘sish qayd etilgan. Bu holat tumanning agrar salohiyati yuqoriligidan dalolat beradi. Ayniqsa chorvachilik tarmog‘i ajralib turadi — ishlab chiqarish hajmi 1177,4 milliard so‘mga yetgan, bu esa umumiy qishloq xo‘jaligi mahsulotlari tarkibida 74,6 foiz ulushni tashkil qiladi. Bu ma’lumotlar asosida xulosa qilish mumkinki, chorvachilik Boysun tumanining yetakchi qishloq xo‘jaligi sohasi sifatida shakllangan va uning iqtisodiyotdagi o‘rni tobora mustahkamlanmoqda. Lekin ushbu sohada Boysun tumani Surxondaryo viloyati reytingida 12-o‘rinni egallaydi. Bunga asosiy sabab esa Boysun tumanida sug‘oriladigan yerlar miqdori kamligi, suv masalasida kuzatiladigan taqchillik va zamonaviy turdagi qishloq xo‘jaligini olib bormaslikdir.

Boysun tumanida qishloq xo‘jaligida foydalaniladigan yerlar tuman jami yer maydonining 65,8% ni tashkil etadi.

Qishloq xo'jaligida foydalaniladigan umumiy yer maydoni(2023-yil 1-yanvar holatida)

Bundan tashqari, dehqonchilik mahsulotlari ishlab chiqarish hajmi 400,7 milliard so‘mni tashkil etib, bu tarmoq umumiy qishloq xo‘jaligi mahsulotlari ichida 25,4 foizlik ulushga ega. Tuman don yetishtirish bo‘yicha viloyatda oxirgi o‘rinda turadi. Bunga asosiy sabab esa suv tanqisligi va sug‘orma dehqonchilik qiladigan yerlarning taqchilligidir. Shuningdek tumanda 1619 gektar yerni ko‘p yillik daraxtzorlar egallagan bo‘lib, tuman jami ekin maydonining 7,8%ini tashkil etadi. Boysun tumani viloyatimiz dehqonchiligida uzum yetishtirish hajmi bo‘yicha 4-o‘rinda, meva yetishtirish hajmi bo‘yicha 5-o‘rinda, kartoshka yetishtirish hajmi bo‘yicha 13-o‘rinda, sabzavot yetishtirish hajmi bo‘yicha 14-o‘rinda va poliz ekinlarini yetishtirish hajmi bo‘yicha 14-o‘rinda turadi. Bu ko‘rsatkichlar tuman hududidagi yer resurslaridan foydalanish, sug‘oriladigan maydonlar samaradorligi hamda ekinlar diversifikatsiyasi darajasini anglash imkonini beradi. Yerlarning nisbatan tog‘li va qiyalik hududlarda joylashganligi, infratuzilmaning yetarli darajada rivojlanmaganligi dehqonchilikning to‘liq salohiyatda ishlashiga ma’lum darajada to‘sqinlik qilmoqda. Shunga qaramay, mavjud salohiyatdan to‘g‘ri foydalanilsa, dehqonchilik hamda bog‘dorchilik, tokchilik va sabzavotchilik kabi yo‘nalishlar bo‘yicha sezilarli natijalarga erishish mumkin.



Boysun tumanida qishloq xo'jalik korxonalari va tashkilotlarining foydalaniladigan yerlari, gektarda (2023-yil 1-yanvar holatiga ko'ra)

Qishloq xo‘jaligi mahsulotlari ishlab chiqarish strukturasi xo‘jaliklar toifasi bo‘yicha tahlil qilinganda, asosiy yuk dehqon va tomorqa xo‘jaliklariga tushadi. Statistik ma’lumotlarga ko‘ra, 2024-yilda tuman bo‘yicha jami ishlab chiqarilgan mahsulotlarning 91,8 foizi dehqon va tomorqa xo‘jaliklariga, 7,9 foizi fermer xo‘jaliklariga va atigi 0,3 foizi qishloq xo‘jaligi tashkilotlariga to‘g‘ri kelgan. Bu ko‘rsatkich tuman iqtisodiyotining ko‘p qismi hali ham an’anaviy, mayda xo‘jaliklarga tayanayotganini anglatadi. Bunda tomorqa xo‘jaliklarining oilaviy turmushdagi ahamiyati, mahalliy darajada o‘zini o‘zi band qilish manbai sifatidagi roli muhim o‘rin tutadi. Biroq, iqtisodiy samaradorlik, mahsuldorlik, texnologik yondashuv jihatidan bu xo‘jaliklarning ko‘pchiligi past darajada bo‘lib qolmoqda. Shu bois, ularni ilmiy-tadqiqotlar asosida mexanizatsiyalash, agrotexnik xizmatlar bilan ta’minlash va kredit resurslariga keng kirish imkoniyatini yaratish lozim.

Xulosa

Boysun tumani qishloq xo‘jaligi salohiyati jihatidan O‘zbekistonning tog‘li mintaqalari orasida yirik agrar tumanlardan biri hisoblanadi. Uning iqtisodiyotida qishloq xo‘jaligi, ayniqsa chorvachilik, hal qiluvchi o‘rin egallaydi. Mavjud resurslardan oqilona va zamonaviy yondashuv asosida foydalanilsa, qishloq xo‘jaligi sohasida yanada yuqori natijalarga erishish mumkin. Shu bilan birga, innovatsion texnologiyalar, iqtisodiy islohotlar va davlat tomonidan yaratilgan imkoniyatlardan keng foydalanish orqali Boysun tumanini nafaqat viloyat miqyosida, balki respublika darajasida yetakchi agroiqtisodiy hududlardan biriga aylantirish mumkin.

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BOYSUN TUMANIDA XIZMAT KO‘RSATISH SOHASINING RIVOJLANISH HOLATI VA ISTE’MOL BOZORI

Annotatsiya: *Ushbu maqolada Boysun tumanida xizmat ko‘rsatish sohasining hozirgi holati, asosiy ko‘rsatkichlari va tarmoqlar kesimidagi tahlil berilgan.*

Kalit so‘zlar: *ijtimoiy infrastruktura, maishiy xizmat ko‘rsatish, savdo, turizm, transport, chakana savdo, logistika, yakka tartibdagi tadbirkorlar (YaTT).*

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THE STATE OF DEVELOPMENT OF THE SERVICE SECTOR AND THE CONSUMER MARKET IN BOYSUN DISTRICT.

Annotation: *This article explores the current state of the service sector in Boysun district, presenting key indicators and a sectoral analysis.*

Keywords: *social infrastructure, household services, trade, tourism, transport, retail trade, logistics, individual entrepreneurs (IE).*

Kirish. Bugungi kunda xizmat ko‘rsatish sohasi har bir davlatning iqtisodiy taraqqiyotida muhim rol o‘ynaydi. Bu soha jamiyatda zamonaviy xizmatlarga

bo‘lgan ehtiyojni qondirish bilan birga, bandlikni ta'minlash, tadbirkorlikni rivojlantirish, ichki bozorda faol iqtisodiy muhit yaratishda ham beqiyos ahamiyatga ega. Xizmat ko‘rsatish sohasi deganda – ishlab chiqarish jarayonida moddiy mahsulotlar yaratilmaydigan, biroq ijtimoiy-iqtisodiy rivojlanishga xizmat qiladigan faoliyatlar majmui tushuniladi. Ushbu maqolada Boysunda xizmat ko‘rsatish sohalari rivojlanishining hozirgi holati, muammolar va istiqbollar tahlil qilinadi.

Tadqiqot metodologiyasi. Tadqiqotda tahliliy-statistik va strukturaviy yondashuv usullari qo‘llanildi. Xizmat ko‘rsatish sohasining asosiy ko‘rsatkichlari 2023–2024-yil statistik ma’lumotlari asosida tahlil qilindi. Hududiy taqqoslash orqali Boysun tumanining boshqa hududlar bilan farqlari aniqlandi. Mavjud muammolar va istiqbolli yo‘nalishlar ekspert baholari asosida belgilandi.

Tahlil va natijalar. Xizmat ko‘rsatish sohasi bozor iqtisodiyoti sharoitida nafaqat ishlab chiqarish tarmoqlarining samarali faoliyat ko‘rsatishiga yordam beradi, balki aholining turmush darajasini oshirish, infratuzilmani rivojlantirish va bandlikni ta’minlashda ham muhim o‘rin tutadi. So‘nggi yillarda O‘zbekiston hukumati tomonidan xizmat ko‘rsatish sohasiga alohida e’tibor qaratilib, ularni qo‘llab-quvvatlash, qulay biznes muhiti yaratish, xorijiy investitsiyalarni jalb qilish bo‘yicha qator chora-tadbirlar amalga oshirilmoqda[4].

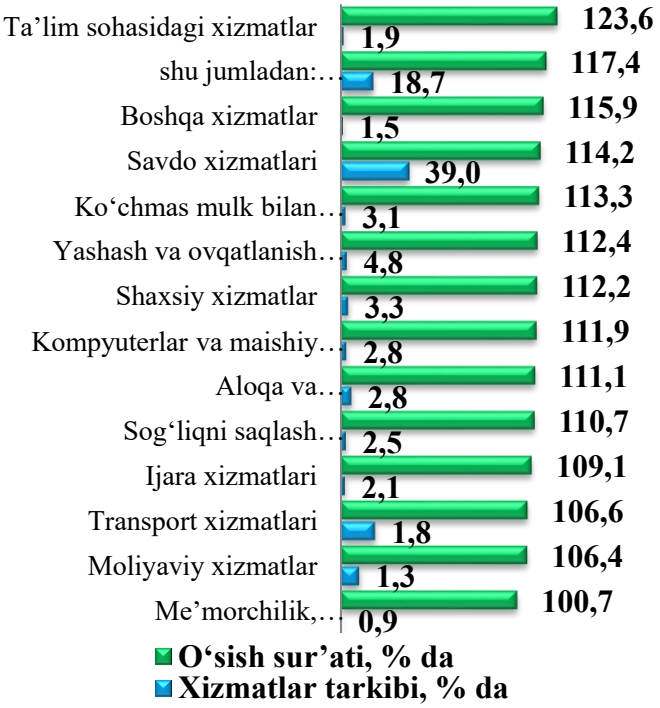
Statistik ma’lumotlarga ko‘ra, xizmatlar sohasining yalpi ichki mahsulotdagi ulushi yildan-yilga ortib bormoqda. Bu esa uni strategik tarmoq sifatida baholash zarurligini ko‘rsatadi.

2025-yil 1-yanvar holatiga ko‘ra, tumanda xizmat ko‘rsatish sohasida jami umumiy 1 332 ta korxona faoliyat yuritmoqda. Ularning 266 tasi yirik, 1 066 tasi kichik va mikrofirmalardir. Shuningdek, 2 ta xorijiy investitsiyalar ishtirokidagi korxonalar ham mavjud. Yangi tashkil etilgan xizmat ko‘rsatish korxonalari soni 174 tani tashkil qilib, 2023-yilga nisbatan 84 taga kamaygan.

1-jadval. Iqtisodiy faoliyat turlari bo‘yicha bozor xizmatlarida ishlab chiqarish. (2024-yil yanvar-dekabr)

	Mlrd so‘m	O‘sish sur’ati, % da	Jami hajimga nisbatan ulushi, % da
Xizmatlar – jami	**587,1**	**111,7**	**100,0**
shu jumladan asosiy turlari bo‘yicha:			
aloqa va axborotlashtirish xizmatlari	36,4	111,1	6,2
moliyaviy xizmatlar	63,1	106,4	10,8
transport xizmatlari	115,7	106,6	19,7
shu jumladan: avtotransport xizmatlari	109,8	117,4	18,7
yashash va ovqatlanish xizmatlari	21,9	112,4	3,7
savdo xizmatlari	228,8	114,2	39,0
ko‘chmas mulk bilan bog‘liq xizmatlar	17,9	113,3	3,1
ta’lim sohasidagi xizmatlar	11,3	123,6	1,9
sog‘liqni saqlash sohasidagi xizmatlar	18,2	110,7	3,1
ijara xizmatlari	14,9	109,1	2,5
kompyuterlar va maishiy tovarlarni ta’mirlash bo‘yicha xizmatlar	20,1	111,9	3,4
shaxsiy xizmatlar	26,1	112,2	4,4
me’morchilik, muhandislik izlanishlari, texnik sinovlar va tahlil sohasidagi xizmatlar	3,6	100,7	0,6
boshqa xizmatlar	9,1	115,9	1,5

Tuman xizmat ko‘rsatish yo‘nalishlari ichida savdo sohasining ulushi eng yuqori bo‘lib, 39% ni tashkil qilmoqda. Shundan so‘ng transport xizmatlari (19,7%), ayniqsa avtotransport xizmatlari (18,7%) yetakchi o‘rinlarni egallaydi. Aksincha, muhandislik va me’morchilik izlanishlari kabi sohalarning ulushi 1% dan kam bo‘lib, bu yo‘nalishlarda salohiyatdan to‘liq foydalanilmayotganini bildiradi.



Iqtisodiy faoliyat turlari bo‘yicha ko‘rsatilgan bozor xizmatlarining o‘sish sur’atlari va takibi. *(2024-yil yanvar-dekabr, % da)*

Shu bilan birga, boshqa xizmat yo‘nalishlari, xususan, axborot texnologiyalari, reklama, turizm, dam olish va sport xizmatlari Boysunda yetarlicha rivojlanmagan.

Chakana savdo – xizmatlar sektorining eng muhim yo‘nalishlaridan biri hisoblanadi. 2025-yil 1-yanvar holatiga ko‘ra, Boysunda 170 ta chakana savdo korxonalari faoliyat yuritmoqda. Shundan 4 tasi yirik korxona, 166 tasi esa kichik va mikro korxonalardir. Bundan tashqari, yuridik shaxs tashkil etmasdan faoliyat yuritayotgan yakka tartibdagi tadbirkorlar (YATT) va jismoniy shaxslar ham tuman chakana savdo sektorida faol ishtirok etishmoqda.

2024-yil davomida chakana savdo aylanmasi 966,7 milliard so‘mni tashkil etib, 2023-yilga nisbatan 8,7% ga o‘sgan. Bu o‘sishda kichik biznes va xususiy tadbirkorlikning ulushi yuqori bo‘lib, 678,1 milliard so‘m yoki umumiy hajmning 70,1% ni tashkil etdi. Uyushmagan savdo sektori esa 283,1 milliard so‘mlik aylanma bilan umumiy savdoning 29,3% ini tashkil qildi.

2024-yilda Surxondaryo viloyatining hududlari bo‘yicha aholi jon-boshiga xizmatlar hajmi reytingida Boysun tumani 10-o‘rinni egallagan. Hududlar kesimida xizmatlar sohasidagi kichik tadbirkorlik yo‘nalishida esa tuman 14-o‘rinni band qilgan, ya’ni, faqatgina Bandixon tumanidan oldinda turgan.

Boysun tumanida xizmatlar sohasi izchil rivojlanib borayotganiga qaramasdan, bir qancha muammolar mavjud: hududiy nomutanosiblik – xizmatlar asosan markaziy hududlarda to‘plangan, chekka qishloq joylarda esa xizmatlardan foydalanish imkoniyati past; infratuzilmaning yetarli darajada rivojlanmaganligi – ayniqsa, axborot texnologiyalari va logistik xizmatlarda zamonaviy infratuzilma

yetishmaydi; malakali kadrlar yetishmovchiligi – ayrim yo‘nalishlarda malakali mutaxassislar yetarli emas; xususiy sektorning cheklanganligi – ayrim sohalarda davlatga qaramlik yuqori bo‘lib, xususiy tadbirkorlar uchun raqobat muhiti to‘liq shakllanmagan; investitsiya muhitining sustligi – xorijiy sarmoyalarni jalb qilish darajasi past bo‘lib, bu xizmatlarning diversifikatsiyasini sekinlashtirmoqda.

Xulosa.

Boysun tumanida xizmatlar sohasi iqtisodiyotning barqaror rivojlanayotgan yo‘nalishlaridan biri hisoblanadi. Savdo, transport va maishiy xizmatlar tuman iqtisodiyotida yetakchi o‘rin egallagan. Shu bilan birga, muhandislik, axborot texnologiyalari, moliyaviy xizmatlar va boshqa zamonaviy yo‘nalishlarda hali to‘liq salohiyatga erishilmagan. Mazkur muammolarni hal etish, xizmat sohasini raqobatbardosh va zamonaviy shaklga keltirish orqali Boysun tumani aholisi farovonligini oshirish, iqtisodiy o‘sish sur’atlarini yanada jadallashtirish mumkin bo‘ladi.

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RAQAMLI IQTISODIYOT SHAROITIDA XIZMAT KO‘RSATISH KORXONALARIDA BIZNESNI RIVOJLANTIRISH TAMOYILLARI VA BOSQICHLARI

Annotatsiya: *Ushbu maqolada raqamli iqtisodiyot sharoitida xizmat ko‘rsatish korxonalarida biznesni rivojlantirish tamoyillari va bosqichlari tahlil qilingan. Raqamli texnologiyalarning xizmat ko‘rsatish sohasiga ta’siri, zamonaviy menejment yondashuvlari va innovatsion yechimlarning ahamiyati yoritilgan.*
Kalit so‘zlar*: raqamli iqtisodiyot, xizmat ko‘rsatish, biznes rivoji, tamoyillar, bosqichlar, innovatsiya, raqamli transformatsiya.*

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PRINCIPLES AND STAGES OF BUSINESS DEVELOPMENT IN SERVICE ENTERPRISES UNDER THE CONDITIONS OF A DIGITAL ECONOMY

Abstract: *This article analyzes the principles and stages of business development in service enterprises under the conditions of a digital economy. It highlights the impact of digital technologies on the service sector, the importance of modern management approaches, and the role of innovative solutions.*
Keywords: *digital economy, service sector, business development, principles, stages, innovation, digital transformation.*

Raqamli iqtisodiyot sharoitida xizmat ko‘rsatish korxonalarida biznesni rivojlantirish muhim ahamiyat kasb etmoqda, chunki raqamlashtirish nafaqat xizmat ko‘rsatish jarayonlarini avtomatlashtirish va optimallashtirish imkonini beradi, balki mijozlar bilan interaktiv va shaxsiylashtirilgan munosabatlarni yo‘lga qo‘yishga zamin yaratadi. Bugungi kunda mijozlar ehtiyojlari tez o‘zgarayotgan bir paytda, raqamli texnologiyalar yordamida real vaqt rejimida xizmat ko‘rsatish, individual yechimlar taklif qilish va xizmat sifati monitoringini yuritish imkoniyati xizmat ko‘rsatish sektorining raqobatbardoshligini oshirishda asosiy omillardan biriga aylanmoqda.

Bundan tashqari, xizmat ko‘rsatish sohasida biznesni rivojlantirish orqali bandlik darajasini oshirish, kichik biznes va startaplar uchun yangi imkoniyatlar

yaratish hamda hududiy iqtisodiy faollikni rag‘batlantirish mumkin. Ayniqsa, sun’iy intellekt, IoT, Big Data kabi raqamli texnologiyalar xizmat turlarining diversifikatsiyasiga, resurslardan samarali foydalanishga va ekologik barqarorlikka erishishga xizmat qiladi. Shu bois xizmat ko‘rsatish korxonalarining raqamli iqtisodiyot sharoitiga moslashuvi va transformatsiyasi O‘zbekistonning barqaror va innovatsion iqtisodiy taraqqiyotida muhim o‘rin tutadi.

Raqamli iqtisodiyotning rivojlanishi dunyo miqyosida xizmat ko‘rsatish korxonalarining faoliyatiga sezilarli ta’sir ko‘rsatmoqda. Ayniqsa, mintaqalarda xizmat ko‘rsatish korxonalarining raqamli iqtisodiyotga moslashishi ularning raqobatbardoshligini oshirish, xizmatlar sifatini yaxshilash va yangi bozorlarni o‘zlashtirish uchun muhimdir.

Raqamli iqtisodiyotning global tendensiyalari bilan hamohang bo‘lish uchun, Dunyo bo‘ylab raqamli iqtisodiyotning ulushi tobora oshib bormoqda. Sun’iy intellekt, Big Data, IoT, blokcheyn kabi texnologiyalar biznesni boshqarishda muhim vositalarga aylanmoqda. Xalqaro savdo, turizm, logistika va boshqa sohalarda raqamli texnologiyalar orqali xizmatlarni boshqarish imkoniyati yanada oshmoqda.

Raqamli iqtisodiyot sharoitida xizmat ko‘rsatish korxonalarida biznesni rivojlantirish tamoyillarini o‘rganishning asosiy maqsadi – bu zamonaviy raqamli texnologiyalar asosida xizmat ko‘rsatish korxonalarining samaradorligini oshirish, ularda innovatsion faoliyatni rivojlantirish hamda raqamlashtirish orqali xizmat sifati, xaridorlar ehtiyojiga moslik va tezkorlikni ta'minlovchi strategiyalarni ishlab chiqishdan iborat. Mazkur maqsad xizmat ko‘rsatish sektorida raqamli transformatsiya jarayonlarini chuqur tahlil qilish, global tendensiyalarni mahalliy sharoitda qo‘llash imkoniyatlarini o‘rganishni talab etadi.

Ushbu tadqiqotning vazifalari qatoriga, birinchi navbatda, raqamli iqtisodiyot sharoitida xizmat ko‘rsatish sohasi korxonalarining holatini baholash, raqamli texnologiyalarning joriy etilishi darajasini aniqlash va ularning iqtisodiy samaradorlikka ta’sirini o‘rganish kiradi. Shuningdek, korxonalarda qo‘llanilayotgan raqamli platformalar, CRM/ERP tizimlari, sun’iy intellekt asosidagi xizmatlarni tahlil qilish hamda ularni joriy etishning afzallik va cheklovlarini ko‘rsatib berish vazifalari ham muhim ahamiyat kasb etadi.

Uchinchi navbatda, tadqiqotning vazifalari sirasiga raqamli transformatsiyaning xizmat ko‘rsatish tizimida biznes jarayonlarni soddalashtirish, xarajatlarni kamaytirish va foydalanuvchi tajribasini (customer experience) yaxshilashga qaratilgan tamoyillarini aniqlash, ularni konseptual modelga asoslangan holda tizimlashtirish hamda sektorning uzoq muddatli rivojlanish strategiyasini ishlab chiqish kiradi. Shu orqali xizmatlar eksportini kengaytirish, mahalliy brendlar raqobatbardoshligini oshirish va barqaror iqtisodiy o‘sishga hissa qo‘shish ko‘zda tutiladi. Raqamli iqtisodiyot sharoitida xizmat ko‘rsatish korxonalarida biznesni rivojlantirish tamoyillari (1-jadval)

1-jadval

Xizmat ko‘rsatish korxonalarida biznesni rivojlantirish tamoyillari

№	Tamoyil nomi	Mazmuni
1	**Raqamlashtirish tamoyili**	Xizmat ko‘rsatishning barcha bosqichlarida raqamli texnologiyalardan foydalanish – buxgalteriya, mijozlar bilan aloqa, xizmat yetkazib berish va marketing jarayonlarini avtomatlashtirish.
2	**Mijozga yo‘naltirilganlik**	Har bir xizmat jarayoni mijoz ehtiyojlarini markazga qo‘ygan holda, personalizatsiya va tezkor javob berishga asoslangan bo‘lishi kerak.
3	**Innovatsion rivojlanish**	Sun’iy intellekt, bulutli hisoblash, IoT va Big Data texnologiyalarini joriy etish orqali xizmat sifati va samaradorligini oshirish.
4	**Barqarorlik va yashil yondashuv**	Energiya tejovchi uskunalar, chiqindilarni kamaytirish va ekologik xavfsiz xizmatlar asosida faoliyat yuritish.
5	**Moslashuvchanlik va tezkor transformatsiya**	Bozordagi o‘zgarishlarga moslashuvchan rejalashtirish va xizmat turlarini mos ravishda yangilash.
6	**Ma'lumotlarga asoslangan qarorlar qabul qilish**	Raqamli tahlillar va mijoz xatti-harakatlari asosida biznes strategiyalarni shakllantirish.
7	**Ochiqlik va shaffoflik**	Raqamli platformalar orqali xizmat narxlari, sifati va mijoz fikrlariga ochiq bo‘lish, ishonch muhitini yaratish.

Bu tamoyillar xizmat ko‘rsatish korxonalarining raqamli muhitda raqobatbardosh bo‘lishi va iqtisodiy samaradorligini oshirishga xizmat qiladi.

1-jadvaldagi har bir tamoyil raqamli transformatsiya jarayonida o‘ziga xos funksional rol o‘ynaydi va umumiy xizmat ko‘rsatish tizimining samaradorligiga xizmat qiladi. Raqamlashtirish tamoyili xizmat ko‘rsatish jarayonlarida raqamli texnologiyalarni to‘liq integratsiyalashni nazarda tutadi. Bunga buxgalteriya tizimlarining elektronlashtirilishi, CRM orqali mijozlar bilan doimiy aloqada bo‘lish, onlayn buyurtmalar, raqamli marketing kampaniyalari kiradi. Bu avtomatlashtirish nafaqat tezlik, balki aniqlik, xarajatlar optimallashtiruvini ham ta'minlaydi.

Mijozga yo‘naltirilganlik tamoyili xizmat markazida mijoz ehtiyojlari turadi. Har bir xizmat, platforma yoki ilova individual mijoz profili, xarid tarixi yoki talablari asosida moslashtirilishi kerak. Bu tamoyil xizmatni personalizatsiyalash, mijozlar tajribasini boyitish va ularning sadoqatini oshirishga xizmat qiladi.

Innovatsion rivojlanish tamoyili sun’iy intellekt (AI), IoT (Internet of Things), bulutli texnologiyalar va Big Data xizmatlar sifatini oshirishda asosiy vositadir. Bu tamoyil xizmat korxonalariga raqobatbardoshlikni saqlab qolish va xizmat turlarini yangilab borish imkonini beradi. Masalan, chatbotlar, avtomatik tahlil vositalari va aqlli yechimlar mijozlarga 24/7 xizmat ko‘rsatadi.

Barqarorlik va yashil yondashuv tamoyili raqamli xizmatlar ekologik jihatdan ham samarador bo‘lishi kerak. Energiya tejamkor uskunalar, qog‘ozsiz hujjat

aylanishi, chiqindilarni kamaytirish – bu tamoyil ijtimoiy javobgarlik va barqarorlik mezonlariga asoslanadi. Bu nafaqat tabiat, balki brend imiji uchun ham foydalidir.

Moslashuvchanlik va tezkor transformatsiya tamoyili bozordagi o‘zgaruvchan talablar va texnologik yangiliklarga tezkor moslashuv xizmat korxonalarining uzoq muddatli barqarorligini ta’minlaydi. Bu tamoyil xizmat turlarini segmentlarga ajratish, tajriba asosida iteratsion (aylanma) yondashuvlarni amalga oshirishga yordam beradi.

Ma'lumotlarga asoslangan qarorlar qabul qilish big Data, analitik platformalar, mijozlar xatti-harakati monitoringi orqali to‘plangan ma’lumotlar asosida strategik qarorlar qabul qilinadi. Bu tamoyil intuitsiyadan ko‘ra, raqamli dalillarga tayanishni targ‘ib etadi, bu esa samaradorlikni sezilarli darajada oshiradi.

Ochiqlik va shaffoflik tamoyili raqamli muhitda xizmat narxlari, foydalanuvchi reytinglari, mijoz fikr-mulohazalari ochiq ko‘rinishda taqdim etilishi ishonch muhitini yaratadi. Bu tamoyil korxonaga mijozlar orasida ijobiy obro‘ orttirishga va sodiqlikni shakllantirishga xizmat qiladi.

Raqamli iqtisodiyot sharoitida xizmat ko‘rsatish korxonalarini rivojlantirishga oid tamoyillar asosida tuzilgan strategik model taqdim etamiz. Modelning asosiy maqsadi — xizmat ko‘rsatish korxonalarida raqamli transformatsiyani tizimli va bosqichli amalga oshirish orqali samaradorlik, mijoz sodiqligi va barqaror o‘sishni ta'minlashdan iborat. "D-MII-SEE" strategik modeli (Digitalization – Mijoz – Innovatsiya – Integratsiya – Ekologik-barqarorlik – Effektivlik).Birinchi bosqichda tashxis (diagnostika) , tamoyillar asosida ma’lumotlarga asoslangan tahlil olib boriladi .Raqamlashtirish darajasini baholash (Raqamli tayyorgarlik indeksi) natijasida,: korxona raqamli salohiyati, ehtiyojlari va imkoniyatlari aniqlanadi.

Ikkinchi bosqichda raqamli transformatsiya tamoyillar asosida, **r**aqamlashtirish,innovatsion rivojlanish, moslashuvchanlik amaliyotda CRM, ERP, IoT, AI kabi texnologiyalarni bosqichma-bosqich joriy etish, xizmat jarayonlarini avtomatlashtirish ishlari tashkil qilinadi. Uchinchi bosqichda, mijozga yo‘naltirilgan xizmatlar yaratish tamoyillar asosida, mijozga yo‘naltirilganlik, ochiqlik va shaffoflik uchun, individual xizmatlar, omnikanal aloqa, real vaqtli fikr-mulohaza tizimi, personalizatsiya strategiyalari ishlab chiqiladi.

Turtinchi bosqichda ekologik va barqaror yechimlar tamoyillari asosida, yashil yondashuv, ijtimoiy javobgarlik bo’yicha chiqindilarni kamaytirish, qog‘ozsiz ofis, energiya tejovchi texnologiyalar, ekologik brending takomillashtiriladi.

Beshinchi bosqichda, monitoring va takomillashtirish tamoyillar asosida, **e**ffektivlik, ma’lumotlarga asoslangan boshqaruv a*maliyoti olib boriladi va* KPI tizimi (foyda, mijoz sadoqati, xizmat sifati, xarajatlar), BI-platformalarda vizual monitoring (Power BI, Tableau) qilinadi.

Natijada:

- Mijozlar ehtiyojlariga mos xizmatlar soni ortadi
- Raqamli ko‘rsatkichlar asosida boshqaruvning aniqligi oshadi
- Innovatsion xizmatlar orqali raqobatbardoshlik kuchayadi

- Ekologik va ijtimoiy jihatdan barqaror muhit shakllanadi

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XIZMAT KO‘RSATISH SOHASIDA BIZNESNI RIVOJLANTIRISHNING NAZARIY ASOSLARI VA TARKIBIY TUZILMASI

Annotatsiya: *Ushbu maqolada xizmat ko‘rsatish sohasida biznesni rivojlantirishning nazariy asoslari, uning tarkibiy tuzilmasi hamda sohaning iqtisodiy rivojlanishdagi o‘rni yoritilgan. Shuningdek, xizmatlar sektori tarkibidagi turli yo‘nalishlarning o‘ziga xos xususiyatlari va ularni rivojlantirish omillari tahlil qilingan.*

Kalit so‘zlar: *xizmat ko‘rsatish sohasi, biznes rivoji, tarkibiy tuzilma, iqtisodiy omillar, innovatsion yondashuv.*

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THEORETICAL FOUNDATIONS AND STRUCTURAL FRAMEWORK OF BUSINESS DEVELOPMENT IN THE SERVICE SECTOR

Abstract: *This article explores the theoretical foundations of business development in the service sector, its structural components, and its role in economic growth. It also analyzes the specific characteristics of various branches within the service industry and the factors that drive their development.*

Keywords: *service sector, business development, structural composition, economic factors, innovative approach.*

Kirish. Jahonda globalizatsiya jarayonlari xizmat ko‘rsatish sohasida xalqaro raqobatni kuchaytirmoqda. Xalqaro standartlar va innovatsiyalarni joriy etish, marketing strategiyalarini takomillashtirish muhim ahamiyatga ega. Xizmat ko‘rsatish sohasida biznesni rivojlantirish dolzarb va amaliy jihatdan ahamiyatli hisoblanadi. Bugungi kunda xizmatlar sektori dunyo miqyosida iqtisodiy o‘sish va ijtimoiy rivojlanishning muhim manbaiga aylangan. Raqamlashtirish jarayonlari butun dunyoda faol davom etmoqda. Xizmat ko‘rsatish sohasida raqamli texnologiyalardan foydalanishning kengayishi biznes modelini o‘zgartirishga olib kelmoqda. Elektron tijorat, onlayn xizmatlar va mobil ilovalar orqali xizmatlarni taklif qilish keng tarqalgan. Mijozlar o‘z ehtiyojlarini tezroq va qulayroq

qondirishni istashadi. Shaxsiylashtirilgan xizmatlar ko‘rsatish va mijozga yo‘naltirilgan strategiyalar dolzarb masalalardan hisoblanadi.

Bugungi kunda, sun’iy intellekt, Internet of Things (IoT), Big Data va boshqa texnologiyalardan foydalanish xizmatlar sifatini oshirishga yordam bermoqda. Innovatsion texnologiyalar mijozlar ehtiyojlarini aniqlash va ularga mos xizmatlarni taklif qilishga imkon beradi. Xizmat ko‘rsatish sohasini rivojlantirish iqtisodiyotning boshqa tarmoqlarini ham rivojlantirishga xizmat qiladi. Turizm, savdo, transport, ta’lim, sog‘liqni saqlash kabi sohalarda iqtisodiy samaradorlik oshadi. Xizmat ko‘rsatish sohasi yangi ish o‘rinlari yaratish imkoniyatlarini oshiradi. Ayniqsa, kichik va o‘rta biznes uchun qulay sharoitlar yaratadi. Innovatsiyalar orqali xizmatlarni shaxsiylashtirish va ularni takomillashtirish imkoniyatlari kengayadi. Yangi yondashuvlar yordamida mijozlar ehtiyojlariga yanada mos xizmatlar taklif etiladi. Xizmat ko‘rsatish sohasidagi ilg‘or xalqaro tajribalarni o‘rganish va ularni milliy sharoitlarga moslashtirish muhimdir.Bu esa, o‘z navbatida, xizmatlar eksportini oshirish va yangi bozorlarni o‘zlashtirish imkoniyatlarini yaratadi.

Umuman, xizmat ko‘rsatish sohasida biznesni rivojlantirishning nazariy yondashuvlari dolzarb va amaliy jihatdan ahamiyatli. Raqamli texnologiyalardan foydalanish, mijozga yo‘naltirilgan strategiyalarni takomillashtirish va xalqaro tajribalarni o‘rganish bu sohaning rivojlanishiga ijobiy ta’sir ko‘rsatadi. Xizmat ko‘rsatish sohasi iqtisodiyotning barqaror o‘sishi, bandlikni oshirish va aholining turmush darajasini yaxshilashda muhim omillardan biri hisoblanadi. Raqamli iqtisodiyot sharoitida ushbu soha yangi bosqichga chiqib, texnologik innovatsiyalar, ekologik barqarorlik va mijozga yo‘naltirilgan xizmat ko‘rsatish modellari orqali iqtisodiyotni diversifikatsiya qilishning tayanch tarmog‘iga aylanmoqda. Ayniqsa, logistika, moliyaviy xizmatlar, sog‘liqni saqlash, axborot texnologiyalari, turizm va ta’lim sohalarida xizmatlar ko‘lami kengayib, xalqaro raqobatbardoshlik omili sifatida xizmatlar eksporti ulushi ortmoqda.

Mazkur yo‘nalishda biznesni rivojlantirish zamonaviy boshqaruv mexanizmlarini, raqamlashtirish darajasini, xizmatlar sifati va innovatsion yondashuvlarni uyg‘unlashtirishni talab etadi. Bu esa nafaqat xizmat ko‘rsatish korxonalari darajasida, balki hududiy va milliy iqtisodiy siyosat kontekstida ham muhim strategik yo‘nalishga aylanadi. Shu bois xizmat ko‘rsatish sohasida biznesni rivojlantirishning ilmiy asoslangan yondashuvlari, iqtisodiy samaradorlik ko‘rsatkichlari, hamda texnologik transformatsiya jarayonlarini chuqur o‘rganish dolzarb ahamiyatga egadir.

Don Tapscott tadqiqotida raqamli texnologiyalarning iqtisodiyotga ta'sirini tahlil qiladi, ayniqsa xizmat ko‘rsatish sohasida biznes modellarining o‘zgarishini ko‘rsatadi [1]. Muallif tarmoq intellekti davrida yuzaga keladigan imkoniyatlar va xavflarni muhokama qiladi. Edward J. Malecki va Bruno Moriset asarlarida mualliflar raqamli iqtisodiyotning biznes tashkiloti, ishlab chiqarish jarayonlari va mintaqaviy rivojlanishga ta'sirini o‘rganadilar [2]. Xizmat ko‘rsatish sohasida raqamli texnologiyalarning integratsiyasi va uning natijalari tahlil qiladi. Adam Jabłoński va Marek Jabłońskilar raqamli iqtisodiyotda ijtimoiy biznes modellari va

ularning xizmat ko‘rsatish sohasidagi ahamiyatini tahlil qiladilar [3]. Ularning tadqiqotlarida yangi kontseptsiyalar va zamonaviy muammolar yoritiladi. Paul X. McCarthy [4] raqamli gigantlarning iqtisodiyot va xizmat ko‘rsatish sohasiga ta'sirini tahlil qiladi, ularning biznes modellarini va muvaffaqiyat omillarini o‘rganadi. Marek Kowalkiewicz [5] raqamli savdoning institutsionalizatsiyasi va uning xizmat ko‘rsatish sohasidagi biznes jarayonlariga ta'siri tahlil qilinadi. Muallif raqamli savdoning rivojlanishi uchun zarur bo‘lgan institutsional o‘zgarishlarni muhokama qiladi.

Marketing, innovatsion va raqamli iqtisodiyot yondashuvlari ushbu sohaning raqobatbardoshligini oshirish, samaradorligini kuchaytirish va sifatni yaxshilashga xizmat qiladi. Xizmat ko‘rsatish sohasida biznesni rivojlantirishni ilmiy-nazariy asosda o‘rganish uning kelgusidagi istiqbollarini belgilashda muhim o‘rin tutadi.

Xizmat ko‘rsatish sohasida biznesni rivojlantirish uchun, Stephen L. Vargo, Robert F. Lusch [6] xizmatlar marketingi uchun yangi nazariy paradigmaga asos solib, mahsulot emas, balki xizmatlar va mijozlar bilan birga yaratiladigan qadriyatlar asosida marketingni qayta ko‘rib chiqishni taklif qilishadi. Bu "Service-Dominant Logic" (SDL) konsepsiyasi xizmatlar iqtisodiyotini tushunishda tub burilish yasagan. **"Service-Dominant Logic" (SDL)** konsepsiyasi — bu xizmatlar iqtisodiyoti va marketing nazariyasining yangi paradigmalaridan biri bo‘lib, **asosiy maqsadi** — mahsulot emas, **xizmatni** markazga qo‘ygan holda qadriyat yaratish jarayonini chuqurroq tushuntirishdir.

Bu iste'molchiga yo‘naltirilgan marketing modelini taklif qilish hisoblanib, SDL mijozlar bilan birgalikda qadriyat yaratishni nazarda tutadi. Ya’ni, kompaniya emas, balki kompaniya + mijoz birgalikda qiymat yaratuvchi subyektlardir. Xizmatni iqtisodiy faoliyatning asosi sifatida qarash esa, har bir mahsulot aslida xizmat ko‘rsatish vositasi sifatida baholanadi. Misol: matkap mahsuloti emas, devorga teshik qilish xizmati uchun kerak. Raqobat ustunligini foydalanuvchi tajribasi orqali belgilash – mahsulot xossalari emas, balki xizmat ko‘rsatish jarayonida hosil bo‘lgan foydalanuvchi tajribasi markaziy o‘rinda bo‘ladi.

1.1-jadval.
SDL konsepsiyasining asosiy mazmuni:

Asosiy g‘oya	Tavsif
Xizmat — iqtisodiy faoliyatning asosi	Har qanday mahsulot yoki jarayon — bu xizmatni yetkazish vositasi
Qadriyat birgalikda yaratiladi	Qadriyat mijoz va tashkilot o‘rtasidagi o‘zaro hamkorlikda vujudga keladi
Resurslar — faol va passiv	Asosiy resurs – bu **inson bilimlari, kompetensiyasi, aloqalari**
Marketing – faoliyat emas, falsafa	Marketing — bu qadriyat yaratish va sheriklikka asoslangan falsafa

Jadvaldan ko’rib turganimizdek, SDL konsepsiyasi **raqamli iqtisodiyot**, **startaplar**, **platforma bizneslar** (Uber, Amazon, Coursera) kabi yangi biznes modellar uchun nazariy asos bo‘lib xizmat qiladi. Bu yondashuv xizmat ko‘rsatish

sohasida biznes strategiyasini zamonaviy va barqaror shakllantirishda muhim metodologik vositadir.

Ushbu jadvalda keltirilgan asosiy g‘oyalar "Service-Dominant Logic" (SDL) kontseptsiyasining markaziy tushunchalariga asoslanadi va zamonaviy xizmatlar iqtisodiyotining mohiyatini chuqur ifodalaydi. Birinchi g‘oya bo‘yicha, iqtisodiy faoliyatda mahsulot emas, balki xizmat ko‘rsatish — asosiy birlik deb qaraladi. Mahsulotlar esa bu xizmatni yetkazib beruvchi vosita sifatida ko‘riladi. Shu orqali, an’anaviy mahsulot markazidan xizmat markaziga o‘tish sodir bo‘ladi. Ikkinchi tamoyil — qadriyat faqat ishlab chiqaruvchi tomonidan emas, balki mijoz va tashkilot o‘rtasidagi interaktiv hamkorlik natijasida vujudga keladi. Bu esa mijozni passiv iste’molchi emas, balki faol sherik sifatida ko‘rishga undaydi.

Uchinchi tamoyilda resurslar "faol" va "passiv"ga ajratiladi. Bu yerda inson kapitali (bilim, malaka, aloqa, tajriba) asosiy faol resurs sifatida e’tirof etiladi, moddiy resurslar esa bu faollikni qo‘llab-quvvatlovchi vosita sifatida talqin qilinadi. To‘rtinchi tamoyilga ko‘ra, marketing endilikda mahsulot sotish vositasi emas, balki mijoz bilan birgalikda qadriyat yaratish falsafasi sifatida qaraladi. Bu yondashuv kompaniyalarni mijoz bilan uzoq muddatli sheriklikka undaydi va brend sodiqligini kuchaytiradi. Umuman olganda, ushbu g‘oyalar xizmat ko‘rsatish sohasida innovatsion yondashuvlarni shakllantirishga zamin yaratadi.

2-jadval.

"Service-Dominant Logic" (SDL) – 10 ta asosiy tamoyil

№	SDL Tamoyili	Qisqacha tavsif
1	**Xizmat – fundamental asos**	Har qanday iqtisodiy almashinuv xizmat ko‘rsatishga asoslangan.
2	**Qadriyat – hamkorlikda yaratiladi**	Kompaniya va mijoz birgalikda qadriyat yaratadi, mijoz – faol ishtirokchi.
3	**Mijoz – qadriyatni belgilovchi subyekt**	Qadriyatni kompaniya emas, aynan mijoz yaratadi va baholaydi.
4	**Xizmat – almashuvning asosiy birligi**	Hamma mahsulotlar xizmatni yetkazib berish vositasidir.
5	**Barcha iqtisodiyot xizmatlarga asoslanadi**	Hatto ishlab chiqarish ham xizmatlar almashinuvining bir ko‘rinishidir.
6	**Mijozlar resurslarni integratsiyalaydi**	Mijozlar o‘zlarining resurslarini (bilim, vaqt, tajriba) xizmatga jalb qiladi.
7	**Tashkilotlar ham mijozlar, ham xizmat taqdimotchilari**	Kompaniyalar o‘zaro xizmat ko‘rsatadi va o‘zaro resurs almashadi.
8	**Qadriyat potentsial emas, balki real qo‘llanishda yaratiladi**	Mahsulot yoki xizmat foydasi u amalda qo‘llangandagina aniqlanadi.
9	**Resurslar – inson kapitali (ma’lumot, malaka)**	Asosiy raqobat ustunligi inson resurslarining faolligidan kelib chiqadi.
10	**Qadriyat almashinuvi – ko‘p tomonlama va murakkab**	Bozor murakkab tarmoq shaklida ishlaydi: tashkilotlar, mijozlar, sheriklar o‘zaro ta’sirlashadi.

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TUPROQ UNUMDORLIGINI OSHIRISHDA ALMASHLAB EKISHNING O‘RNI

Annotatsiya: *Ushbu maqolada 2022-2025 yillar davomida tuproq strukturasini yaxshilashga doir olib borilgan tadqiqot natijalari va amali va nazariy tushunchalarning ilmiy asosi bayoni keltirilgan.*

Kalit so‘zlar: *tuproq-iqlim, suv–havo, begona o’tlar, g’o’za, kartoshka, makkajo’xori, loviya, arpa, hasharotlar, kasalliklar*

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THE ROLE OF CROP ROTATION IN INCREASING SOIL FERTILITY

Annotation*. This article presents the results of research conducted during 2022-2025 on improving soil structure and a description of the scientific basis of practical and theoretical concepts.*

Keywords*: soil-climate, water-air, weeds, cotton, potatoes, corn, beans, barley, insects, diseases*

KIRISH. O‘simlikshunoslikning ekinlarni yetishtirish texnologiyasi qismining vazifalariga – o’simlikning me’yorida o’sib, rivojlanishi, yuqori hosil shakllantirish uchun – ilmiy asoslangan almashlab ekishlarni joriy etish, ekinni eng yaxshi o’tmishdoshidan keyin joylashtirish, tuproqni ishlashda ildiz tizimining yaxshi rivojlanishi uchun optimal suv–havo, oziqlanish rejimini yaratish, organik-ma’danli o’g’itlardan samarali foydalanish, begona o’tlar, kasalliklar va zararkunandalarga qarshi kurashda integral (uyg’unlashgan) uslublardan foydalanish, ekish uchun Davlat standart (andoza)lari talabiga javob beradigan urug’lardan foydalanish, ekish muddatlari, me’yorlari, chuqurligini optimallashtirish, o’simlikni o’suv davrida, eng maqbul sug’orish tartibini yaratish, Davlat reyestriga kiritilgan yoki istiqbolli navlar, duragaylarni ekish, hosilni qisqa muddatda, nobudgarchiliksiz yig’ishtirib olish, dastlabki ishlov berish va saqlash tadbirlarini o’z vaqtida hamda sifatli bajarish masalalarini o’rganish kiradi.

Material va metodlar. O’zbekistonda dala ekinlarini yetishtirishda agrotexnologiyani qo’llashda, ekinlarni almashlab ekishda joylashtirish, tuproq-iqlim sharoiti, bozorda shu ekin mahsulotiga bo’lgan talab, energiyani, resurslarni tejaydigan, ekologik toza mahsulotni ishlab chiqish talablariga rioya qilinadi.

Almashlab ekish – agrotexnika talablariga muvofiq ravishda har bir dalaga

turli ekinlarni yil sayin ma’lum tartibda navbatlab ekishga aytiladi.

Organik dehqonchilikda almashlab ekish tuproq unumdorligini oshirishdan tashqari zararkunandalar, begona o‘tlar va kasalliklarga qarshi kurashda muhim o‘rin tutadi. Yaxshi rejalashtirilgan almashlab ekish hasharotlar, kasalliklar va begona o'tlarga qarshi kurashni yaxshilashga, tuproq tuzilishini saqlashga yoki yaxshilashga va organik moddalar miqdorini oshirishga yordam beradi. Almashlab ekishda dukkakli ekinlardan foydalanish keyinchalik azotni qo‘llash zaruratini kamaytiradi, bu esa dukkakli ekinlarning qiymatini oshiradi. Dukkaklilar tuproqdagi azot miqdorini tugun bakteriyalari tomonidan fiksatsiya qilish orqali ko'paytirsa ham, dukkakli ekinlarni ketma-ket ekishdan qochish kerak, chunki bu salbiy azot miqdoriga olib kelishi mumkin. Yaxshi almashlab ekish yanada ishonchli va barqaror hosilni ta'minlashi, tuproq unumdorligini oshirishi va organik qishloq xo'jaligi mahsulotlarida istalgan hosildorlik va sifat darajasiga erishishga potentsial hissa qo'shishi mumkin. Boshqa ekinlar, masalan, chuqur ildizi bor ekinlar tuproqning ozuqa moddalari zahirasidan chuqurroq qatlamdan foydalana oladi, boshoqli ekinlar esa ildiz uzunligi katta bo‘lganligi sababli, ozuqa moddalarini kengroq maydondan tortib olishi mumkin. Almashlab ekish tuproq sifatini yaxshilash (kattaroq yoki chuqurroq ildizlar; ildiz ekssudati), tuproq profilida ozuqa moddalarining yaxshi taqsimlanishi (chuqur ildizli ekinlar chuqur qatlamlardan ozuqa moddalarini ajratib olish) va biologik faollikni oshirish nuqtai nazaridan ham foyda keltirishi mumkin.

Muhokama. No’xat tuproqni azotga boyitadi, qator oralari ishlanadigan ekin sifatida dalani begona o’tlardan tozalaydi. Sug’oriladigan, shuningdek, lalmikor yerlarda no’xat kuzgi don ekinlari uchun yaxshi o’tmishdosh. Bruxus qo’ng’izidan zararlanmaydi. Dukkakli don ekinlari orasida lalmikorlikda eng yuqori 10-12 s/ga don hosil beradi.

Almashlab ekishlarida 3:6 (2:4:1:2), 7:3 (2:4:1:3), 2:8 (1:4:1:4) don dukkakli ekinlar uchun ajratilgan dalalarga bir yil ekiladi. No’xat bahorda yoki kuzda ekilganda hosildan bo’shagan maydonlar darhol haydalib makkajo’xori don yoki silos uchun yoki kartoshka va boshqa ekinlar ekiladi. Ko’plab o’tkazilgan tajribalarning natijalariga ko’ra no’xat o’zidan keyin tuproqda 40-80 kg/ga sof azot qoldiradi.

No’xatdan bo’shagan dalalarga ekilgan g’o’za, kartoshka, makkajo’xori, boshoqli don ekinlari hosildorligi ortib, don sifati yaxshilanadi.

Ba'zi ekinlar yuqori biomassaga ega bo'lganligi sababli tuproqning organik moddalarini to'ldirish qobiliyatiga qarab tanlanadi. Bu, shuningdek, to'g'ri geografik joylashuvni tanlashni o'z ichiga oladi. Yashil go'ng ekinlari nuqtai nazaridan, bu barcha talablarga javob beradigan turlar qatoriga ega bo'lish maqsad bo'lishi kerak. Ushbu dizayn jihatlari ishlab chiqaruvchining organik ishlab chiqarishda zararkunandalar, begona o'tlar va kasalliklarni samarali boshqarish qobiliyatiga sezilarli ta'sir ko'rsatadi. Ekinlar ketma-ketligiga ta'sir qiluvchi va almashlab ekish sxemasini tanlashda e'tiborga olinadigan omillarga donli ekinlarni tanlash va ularning bir-biri bilan aloqasi, unumdorlikni oshiradigan va zararkunandalar va kasalliklarni yo'q qiladigan ekinlar, masalan, em-xashak va yashil o'g'itlar kiradi.

Tanlangan ekinlar bozori, mavjud resurslar (masalan, mehnat va asbob-uskunalar), almashlab ekishning iqtisodini va agar ular almashlab ekishning bir qismi bo'lsa, chorvachilikning rolini hisobga olish kerak bo'lgan boshqa omillar. Almashtirish uchun ekinlarni tanlashda bir nechta foydalanish variantlarini hisobga olish foydalidir - masalan, qayta ishlangan yoki yangi - va bu holatda ehtiyotkorlik bilan nav tanlash juda muhimdir. Organik sertifikatlash organlari har qanday uch yillik davrda kamida bir yil yashil go'ng, dukkakli yoki yaylov ekinlarini etishtirish bosqichini o'z ichiga olishi kerakligini belgilashi mumkin. Agar birlamchi unumdorlikni o'rnatish uchun kompost muntazam ravishda qo'llanilsa yoki hayvonlar tizimga kiritilgan bo'lsa, bu kerak bo'lmasligi mumkin.

Mineral azotli o'g'itlar narxining oshishi va er osti suvlarining ifloslanish xavfi dukkakli ekinlarga nafaqat organik, balki an'anaviy tizimlarda ham qiziqishni kuchaytirdi. Mevali daraxtlar kabi ko'p yillik ekinlarni organik ishlab chiqarishda, oraliq ekinlar yoki qoplamali ekinlarni etishtirish fermerga foyda keltirishi mumkin bo'lgan vositadir. Mevali daraxtlar o'nlab yillar davomida saqlanib qolganligi sababli, dukkakli yoki aralash ekinlarni etishtirishning afzalliklariga oraliq ekinlar yoki qopqoq ekinlarini etishtirish orqali erishish mumkin. Qish mavsumida, ayniqsa, bargli bog'larda tuproq yuzasini qoplamali ekinlar bilan qoplash tuproq eroziyasini va ozuqa moddalarining yuvilishini oldini oladi. Shu bilan birga, qoplamni tanlashda e'tiborga olish kerak bo'lgan bir nechta muhim jihatlar mavjud, xususan:

1.Bu turlar daraxt ekinlarining kasalliklari yoki zararkunandalari uchun ko'payish joyi bo'lib xizmat qilmasligi kerak.

2.Ular suv va tuproq ozuqalari uchun kuchli raqobat qilmasligi kerak.

3.Ular o'z vaqtida yig'ib olish amaliyotiga aralashmasliklari kerak.

4.Tuproq eroziyasini oldini olish uchun kuchli yog'ingarchilik davrida yaxshi o'sishi va sug'orishni talab qilmasligi kerak;

5.Tuproqda turg'un va tajovuzkor bo'lmasligi kerak.

Xulosa. Organik ishlab chiqaruvchilar ko'pincha almashlab ekishda keyingi ekinlar uchun azotni mustahkamlash uchun dukkakli o'simliklarni o'z ichiga oladi. Chuqur ildiz tizimiga ega bo'lgan qoplangan ekinlar tuproq profilining chuqur qismidan ozuqa moddalarini ajratib olishi va tuproqdagi havoni, drenajni va suvni ushlab turish qobiliyatini yaxshilaydigan biopora tarmog'ining rivojlanishiga yordam beradi. Turlarning turli funktsiyalaridan foydalanish uchun o'zaro ekinlardan foydalanish mumkin (masalan, vetch + arpa). Tabiiy o'simliklar, shuningdek, suv va ozuqa moddalari uchun raqobatlasha boshlaganida, qoplama sifatida ishlatilishi mumkin. Tabiiy o'simliklar xilma-xilligini oshirish yoki xo'jalik uchun foydaliligini oshirish uchun dukkaklilar yoki boshqa turlar bilan boyitilgan bo'lishi mumkin.

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QUYONLARDA SIMPATIK POYA TUGUNLARI BEL QISMINING YOSHGA BOG`LIQ RIVOJLANISHI

Annotatsiya: *Maqolada quyonlarda lomber simpatik gangliyalarning yoshga bog'liq rivojlanishi o'rganiladi. Tadqiqotning makroskopik va mikroskopik usullari qo'llaniladi. Bizning materialimiz lomber simpatik gangliya neyronlarining farqlanishi va tanadagi muhim fiziologik o'zgarishlar o'rtasidagi ba'zi naqshlarni aniqlashga imkon berdi.*

Kalit so'zlar: *quyon, simpatik ganglionlar, Bilshovskiy-Gross bo'yicha usullar, Kampos, Nissl bo'yash, bel ganglionlari, neyroblastlar.*

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AGE-RELATED DEVELOPMENT OF LUMBAR SYMPATHETIC GLANDS IN RABBITS

Abstract: *The article studies the age-related development of lumbar sympathetic ganglia in rabbits. Macroscopic and microscopic methods of research are used. Our material allowed us to establish some patterns between the differentiation of neurons of the lumbar sympathetic ganglia and important physiological changes in the body*

Keywords: *rabbit, sympathetic ganglia, methods according to Bilshovsky-Gross, Campos, Nissl staining, lumbar ganglia, neuroblast.*

Kirish. So‘nggi yigirma yil davomida organlar va tizimlarning o‘sish jarayonidagi tuzilish xususiyatlariga qiziqish sezilarli darajada oshdi [1,2]. Biroq, bu nuqtai nazardan barcha tizimlar bir xil darajada o‘rganilmagan [3,4]. Adabiyotlarda vegetativ nerv tizimi tugunlarining yoshga bog‘liq o‘zgarishlari bo‘yicha faqat ba’zi ma’lumotlar mavjud bo‘lib, gerontologiya tibbiyotning yangi sohasi rivojlanishi munosabati bilan bu masala alohida ahamiyat kasb etmoqda [5]. Laboratoriya hayvonlarining bel simpatiya tugunlari morfologiyasi bo‘yicha alohida ishlar mavjud. Quyonda bel simpatiya tugunlarining yoshga bog‘liq xususiyatlariga bag‘ishlangan maxsus tadqiqotlarni biz mavjud adabiyotlarda topmadik.

Tadqiqot maqsadi. Quyonda bel simpatiya tugunlarining yoshga bog‘liq rivojlanishini o‘rganish.

Tadqiqot materiallari va usullari. Ushbu tadqiqotning vazifasi quyonda bel simpatiya tugunlarining rivojlanish qonuniyatlarini aniqlash bo‘lib, buning uchun makroskopik va mikroskopik tadqiqot usullari (Vorobyov-Sinelnikov bo‘yicha makro-mikroskopik preparatlash usuli, bel tugunlarining kesmalarini Bilshovskiy-Gros, Kampos bo‘yicha impregnatsiya qilish, Nissl bo‘yicha bo‘yash) qo‘llanildi. Makroskopik preparatlarda magistral va tugunlarning o‘lchovlari shubler yordamida amalga oshirildi. Homilalarda o‘lchovlar MBS-2 mikroskopi yordamida qilindi. Neyronlar va ularning yadrolarining o‘lchovlari Nissl bo‘yicha bo‘yalgan preparatlarda okulyar mikrometr yordamida o‘tkazildi. Biologik ob’ektlarning umumiy o‘zgaruvchanligini hisobga olgan holda, o‘rganilayotgan materialning dinamik qatorlarini ob’ektiv tahlil qilish uchun raqamli ma’lumotlar usuli bilan ishlov berildi.

Tadqiqot natijalari. Tadqiqotlarimiz shuni ko‘rsatdiki, quyonning bel simpatiya magistralining bel qismi ko‘krak bo‘shlig‘idan qorin bo‘shlig‘iga diafragmaning lateral va o‘rta oyoqlari orasidan o‘tib, bel umurtqalarining ventral-lateral yuzasida, bel mushaklarining medial chetlari ostida joylashadi. Bel simpatiya magistralidagi tugunlar soni 3 dan 7 gacha o‘zgaradi. Homilalarda odatda 5 ta tugun, yangi tug‘ilganlarda 5-6 ta tugun, katta yoshli quyonlarda esa 7 tagacha tugun mavjud bo‘lib, bu ontogenezda tugunlar sonining qonuniy ravishda oshishini ko‘rsatadi. Quyonda bel simpatiya tugunlarining uzunligi homilalarda 0,97 ± 0,39 dan 4,10 ± 0,78 mm gacha, yangi tug‘ilganlarda 2,33 ± 0,17 dan 5,70 ± 2,30 mm gacha o‘zgaradi. 2-5 yosh va undan katta yoshda tugunlarning uzunligi 18,08 ± 1,86 mm ga yetadi. Dinamik qatorlarning grafik ko‘rsatkichlari ma’lum qonuniyatlarni aniqlashni osonlashtirishi hisobga olinib, biz tugunlarning uzunligi bo‘yicha yosh aspektida alohida tugunlarning rivojlanish ko‘rsatkichlarini aks ettiruvchi grafiklarni yasadik. O‘ng va chap bel simpatiya tugunlarining uzunlik ko‘rsatkichlarining dinamikasi asosan bir xil xarakterga ega bo‘lib, chap tugunlarning egri chizig‘i biroz ustunlik qiladi. Bu, ayniqsa, 1-2 yoshdagi birinchi va ikkinchi tugunlarda yaqqol namoyon bo‘ladi. Chap to‘rtinchi va oltinchi tugunlarda egri chiziqning cho‘qqisi 6 oydan 1 yoshgacha bo‘lgan yoshga to‘g‘ri keladi, chap beshinchi bel tugunida esa bu postnatal davrning dastlabki bosqichida eng aniq ko‘rinadi. Egri chiziqlar tahlili bel tugunlarining rivojlanishida quyidagi qonuniyatlarni aniqlashga imkon berdi: 1) postnatal rivojlanishning boshidan 6 oygacha tugunlarning uzunligi asta-sekin va teng ravishda o‘sadi; 2) 6 oydan 1 yoshgacha bo‘lgan davrda tez o‘sish xarakterlidir. Bu qonuniyat, ehtimol, ichki organlar, shu jumladan endokrin va jinsiy organlarning jadal rivojlanishi bilan izohlanadi, buning natijasida bel tugunlarining funksional faolligi ham ortadi; 3) keyingi rivojlanish bosqichlari umumiy holda tugunlar o‘sishining barqarorlashuvi va jinsiy yetuk organizmga xos bo‘lgan kichik o‘zgarishlar bilan xarakterlanadi. Egri chiziqning cho‘qqisi 1-2 yoshga to‘g‘ri keladi. Bu, ehtimol, hayvonlarning jinsiy yetilishi bilan bevosita bog‘liq bo‘lib, bu davrda ichki organlar va tizimlarning funktsiyalari neyrogumoral mexanizmlarning rivojlanishi tugashi bilan

parallel ravishda eng faol namoyon bo‘ladi. Bel tugunlarining uzunligi va kengligi ko‘rsatkichlari o‘rtasidagi korrelyatsion bog‘lanishlar alohida qiziqish uyg‘otadi. Ontogenezda barcha tugunlar va yosh guruhlarida uzunlik va kenglik ko‘rsatkichlari o‘rtasidagi korrelyatsion bog‘lanishlar yuqori ishonchlilik darajasida ijobiydir. Istisno sifatida o‘ng bel tugunlari bo‘lib, ularda korrelyatsiya koeffitsienti [+0,841 ± 0,15] bo‘lsa-da, yuqori bo‘lishiga qaramay, statistik ishonchlilik darajasidan biroz pastroqdir. Bel simpatiya tugunlarining rivojlanish dinamikasini xarakterlash uchun tugunlarning o‘lchamlari foiz nisbati shaklida qiziqish uyg‘otadi: homilalar, yangi tug‘ilganlar, ko‘zi ochilgan va o‘sib borayotgan yosh hayvonlardagi tugunlarning o‘lchamlari jinsiy yetuk hayvonlardagi tugunlar o‘lchamlariga nisbatan (shartli ravishda 100% deb qabul qilingan) hisoblanadi. Ushbu ma’lumotlarga asoslanib, quyidagi qonuniyatlar aniqlandi: 1) barcha hollarda embrional davrdan jinsiy yetuklik holatigacha chiziqli o‘lchamlar ko‘rsatkichlarining progressiv o‘sishi kuzatiladi. Biroq, ba’zi tugunlarda umumiy qonuniyatdan biroz chekinish kuzatiladi, bu, ehtimol, hayvonlarning individual xususiyatlari va boshqa tushuntirib bo‘lmaydigan omillar bilan izohlanadi; 2) 1-6 oylik yoshdagi hayvonlarda tugunlar o‘lchamlarining keskin oshishi diqqatni tortadi, bu, ehtimol, hayvon organizmida mustaqil oziqlanishga o‘tish, jinsiy yetilish va endokrin organlarning funksional faolligining oshishi kabi muhim fiziologik o‘zgarishlar bilan bog‘liq. Shuningdek, biz quyonning bel simpatiya tugunlaridagi nerv hujayralarining rivojlanishini proneroblast bosqichidan (spesifik bo‘lmagan davr) boshlab, yosh va multipolyar neyroblast shakllaridan involyutsion davrgacha o‘rgandik. 2-5 yoshdan boshlab mikrometrik ko‘rsatkichlar sezilarli darajada kamayadi. Bu holat neyronlar va ularning yadrolari diametri o‘rtasidagi korrelyatsion bog‘lanishlar hisob-kitoblari bilan tasdiqlanadi. Korrelyatsiya koeffitsienti +0,967 ± 0,02 ni tashkil qiladi, ishonchlilik darajasi esa >99%. Tugunlar, neyronlar va ularning yadrolari eng katta o‘lchamlarga 1-2 yoshda yetadi (mos ravishda 18,08 ± 0,86 mm; 35,5 ± 0,98; 13,2 ± 0,3 mkm).

Xulosa. Shunday qilib, bizning materialimiz neyronlarning bel simpatiya tugunlarining differensiatsiyasi va organizmning muhim fiziologik o‘zgarishlari (ko‘zi ochilishi, mustaqil oziqlanishga o‘tish, jinsiy yetilish) o‘rtasidagi ba’zi qonuniyatlarni aniqlashga imkon berdi.

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ARAB TILIDA YOZISH KO‘NIKMASINI RIVOJLANTIRISH BO‘YICHA BA’ZI SHARHLAR (B2 DARAJASI MISOLIDA)

Annotatsiya: *Maqolada arab tilida yozish ko‘nikmasini rivojlantirish usullari bayon qilingan. Va u talabalarga arab tilida insho yozish bo‘yicha kerakli ma‘tumotlarni taqdim etadi. Arab tilini o‘rganuvchilarda aynan yozish ko‘nikmasida ko‘p uchrovchi xato va kamchiliklar va ularni bartaraf qilish yo‘llari taqdim etilgan. Va albatta, o‘quvchining yozish darajasini sezilarli darajada oshiruvchi arab tilidagi muhim gap tuzish stukturalari va ularga misollar keltirilgan. Va yana, o‘quvchi o‘zining yozish ko‘nikmasidagi darajasini CEFR me’zonlariga asosan bilib olishi mumkin.*

Kalit so‘zlar: *esse, insho, gap strukturalari, shaxsiy xat, rasmiy xat, yozuvdagi xatolar, CEFR me’zonlari.*

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SOME COMMENTS ON DEVELOPING WRITING SKILLS IN ARABIC (BASED ON THE B2 LEVEL)

Abstract: *The article describes the methods of developing writing skills in Arabic. And it provides students with necessary information for writing essays in Arabic. It presents the most common mistakes and shortcomings in writing skills among Arabic language learners and shows the ways to eliminate them. And for sure, the important sentence structures in Arabic that significantly increase the student's writing level and are given with examples. And also, the student can recognise his level of writing skills wich is based on the CEFR’s criteria.*

Keywords: *essay, composition, sentence structures, personal letter, formal letter, writing errors, CEFR standards.*

Arab tilida yozma fikr bildira olish, insho yoki esse yoza bilish bu tilni o‘rganuvchilar uchun katta ahamiyat kasb etadi. Har bir talaba bu ko‘nikmani puxta o‘zlashtirmog‘i darkor. Bunda talabadan bu narsa ustida ko‘proq mehnat qilish talab etiladi. Shu sababdan maqolada arab tilini o‘rganuvchilar uchun, aynan yozish ko‘nikmasini rivojlantishga katta ahamiyat qaratildi. Bundan asosiy maqsad talabaning arab tilida yozish mahoratini to‘liq shakllantira olish va unga kerakli maslaxatlarni taqdim etishdir.

Arab tili o‘z ona tilisi bo‘lmagan o‘quvchilarda bu tilda o‘z fikrini yozma tarzda bayon qila olishi juda ham muhim. Bunda asosan talabadan insho yoki esse

yozish talab etiladi. Keling avvalo insho va essseni bir biridan farqlab olamiz. Demak **insho** – bu berilgan mavzuni yozma tarzda ta'riflay olish, uni taxlil qila bilish va hikoya qila olishdir. Insho asosiy 3 qismdan iborat, bular: kirish qismi, asosiy qism va xulosa. Inshoda asosan biron mavzuni taxlil qilshga ahamiyat qaratiladi. Va u ham rasmiy, ham norasmiy bo'la oladi.

Esse asosan yozuvchini mavzu yoki muammo haqida shaxsiy fikrlarini bayon qilishga undaydi, uni tahlil qilish va mavzuga oid xayotdan misol va argumentlar keltirilishini talab etadi. Esse yozuvchini erkin fikrlshga chaqiradi va u odatda norasmiy shaklda bo'ladi. Endi insho va esseni arab tilida yozishni **strukturaviy**, ya'ni arab tilida ko'p foydalaniladigan so'z birikmalaridan foydalangan holda ko'rib chiqish zarur bo'ladi.

Arab tilida insho yozish. Inshoda yuqorida aytib o'tganimdek 3 ta qism mavjud: kirish qismi, asosiy qism va xulosa. Insho yozishda bu tartibga rioya qilmaslik katta xato va matn tartibsiz bo'lib qolishiga olib keladi. Shu sababli har bir qismga alohida e'tibor bilan yondashish lozim.

1. ***Kirish qismi*** (المقدمة). Bu qismda mavzuning hozirgi globallashuv davridagi ahamiyati, uning o'rni va insonlar xayotiga ta'siri bayon qilinadi. Kirish qismida mavzuni 3-4 jumla bilan o'quvchiga yoki tekshiruvchiga bayon qilib bera olish juda muhim. Chunki kirish qismi siz mavzuni qay darajada tushunganingizni ko'rsatib beradi. Misol tariqasida, kirish qismida quyidagi strukturalardan foydalanish mumkin:

في حياتنا اليومية إنّ ...

Kundalik xayotimizda …

لا شك أن…

Shak-shubha yo'qki, …

من المتّفق عليه بشكل عامّ أنّ…

Umumiy holda unga hamma qo'shiladiki, …

في عصرنا الحديث…

Bizning zamonaviy davrimizda …

Bu so'z birikmalari barcha mavzuga to'gri keluvchi strukturalar hisoblanib, arab tilida shu va shunga o'xshash struktualardan foydalanish o'ta muhim. Biroq mavzuga xos bo'lgan individual gap tuza olish til bilish darajasining yuqori ekanini ko'rsatuvchi omillardan hisoblanadi. Demak kirish qismida mavzu haqida asosiy tushuncha keltirilishi lozim ekan.

2. ***Asosiy qism***. (الجزء الرئيسي). Bu qism ikki, uch, yoki undan ham ko'p paragraflardan tashkil topgan bo'lishi mumkin. Bu qism mavzuni to'liq turli sohalarda yoritib berish uchun mo'ljallangan. Mavzuning tarix va hozirgi kundagi ahamiyati, insonlarning unga bo'lgan munosabati va ilmiy yoki xayotiy misollar keltiriladi. Asosiy qism insho yozuvchining arab tilidagi yozish qobiliyatini to'laligicha ko'rsatib berishi mumkin, agarda talaba o'z bilganlarini tartibli va grammatik to'g'ri bayon qila olsa. Inshoning tartibli bo'lishi uchun nima qilish kerak?

Insho tartibli va tushunarli bo‘lishi uchun avvalo asosiy qismda yozishimiz lozim bo‘lgan fikrni xayolan tartiblab olish lozim. Buning uchun mavzu haqida yetarlicha ma’lumot bo ‘lishi kerak. Mavzu haqida biron fikirni tugallamasdan turib keyingi fikrga yoki ma’lumotga o‘tish katta xato. Biron bir fikr to‘liq bayon qilingachgina keyingi ma’lumotni berish mumkin. Bunda bizga أولا, ثانيا , ثالثا tartib sonlari yordamga kelishi mumkin. Va albatta, ma’lumot va fikrlar mavzudan chetga chiqmasligi lozim, bu inshoning zerikarli bo‘lib qolishiga sabab bo‘ladi.

Ilmiy izlanishlar va tadqiqotlardan misollar keltirish, statistik ma’lumotlar va faktlar bilan fikrni tasdiqlash insho sifatini oshiradi. Buning uchun talaba aniq ma’lumotga ega bo‘lishi lozim. Bunda quyidagi strukturalardan foydalanish mumkin:

1. في عالم اليوم المعلوم أنّ …

Bugungi olamda shu narsa ma’lumki, …

2. أظهرت العديد من الدراسات أنّ…

Ko‘plab tadqiqotlar shuni ko‘rsatadiki, …

3. لقد لاحظ العلماء منذ فترة طويلة أنّ…

Olimlar ko ‘p vaqtdan buyon e ‘tibor berdilarki, …

Faktlar bilan bir qatorda vaziyatga mos keluvchi xayotiy voqealardan misollar ham keltirish mumkin. Biroq voqeaning qisqa va tushunarli bo ‘lishiga e’tibor berish muhim. Shu tariqa mavzuning insonlar xayotidagi ahamiyati to‘iq tahlil qilingach va uni tartib bilan bayon qilingandan so‘ng asosiy qism yakunlanadi. Yakunlangan fikringiz ma’no jihatidan tugallangan bo‘lishi darkor.

3. ***Xulosa***. (خاتمة). Bu qism inshoning zarur qismi hisoblanadi. Kirish qismi va asosiy qismda keltirilgan barcha ma’lumotlarni 1-2 jumla yordamida ta’kidlash, ya’ni xulosalash inshoning tushunarli va tartibli bo‘lishini ta’minlaydi. Bu qismda yangi ma’lumotlar berilmaydi, balki shunchaki eskilari xulosa o‘rnida ta’kidlab o‘tiladi. Bu qismda quyidagi so‘zlar yordamga keladi:

بالمختصر…

Qisqa qilganda, …

و تخليصا لما سبق، ...

Yuqoridagilarning xulosasi shuki, …

إجمالا…

Umuman olganda, …

Yuqorida misol tariqasida keltirilgan barcha strukturaviy so‘z birliklari B2 darajasida bo ‘lib, ulardan insho yozuvchining so‘z boyligidan kelib chiqqan holda foydalanish mumkin, ya’ni yetarlicha leksik ko ‘nikmaga ega bo ‘lgan talaba boshqa mavzuga doir yuqori darajali strukturalardan foydalanilishi mumkin.

Arab tilida esse yozish. Essening o‘ziga hosligi shundaki, u yozuvchidan shaxsiy fikrni yoki biron muammoga yechimni talab etadi, uni yana muhokama insho ham deyiladi. Yozuvchi mavzuga doir turli qarashlarni tahlil qilishi, hayotiy misollar keltirishi va o‘z fikrini qo‘llab quvvatlovchi dalillarni talab qiladi. CEFR imtihonlarida ko‘pincha talabalardan esse yozish talab etiladi. Masalan biron dolzarb muammo haqida turlicha fikrlarni yoritib berishni talab qilinishi mumkin,

bunda berilgan mavzuning talablariga ko‘ra ish tutiladi, agar mavzu talablari to‘liq bajarilmasa, ya’ni mavzuda keltirilgan biron jihat esseda yoritilmagan bo‘lsa esse sifatiga katta ta’sir ko‘rsatadi.

Esse ham ***kirish qismidan*** boshlanadi. Kirish qismida mavzuning ahamiyati, inson hayotidagi o‘rni va undagi asosiy muammolar ko‘rsatiladi. Doimo kirish qismining chiroyli, ma’noli, tushunarli va eng asosiysi tartibli bo‘lishiga ahamiyat qaratish zarur, chunki u o‘quvchi yoki tekshiruvchida birinchi ta’surotni uyg‘otadi.

Asosiy qism. Bu qism tahminan 3ta paragrafdan tashkil topadi.

1 – paragraf. Bu qismda yozuvchi mavzu yuzasidan bir tomon fikrini ko ‘rib chiqadi, tahlil qiladi va misol bilan tasdiqlaydi.

2 – paragraf. Bu safar boshqa tomonning fikrini yoritib beriladi, sabablar, tahlil va dalillar bilan ma‘lumotlar keltiriladi.

3 – paragraf. Bu qisim to‘liq shaxsiy fikrga asoslangan bo‘lib bu qismda yuqorida ko‘rsatilgan fikrlarning qay biri afzalroq ekanini yozuvchi shaxsiy fikrlari bilan tahlil qiladi. Muammoga yechim izlaydi, misollar va faktlar bilan fikrini tasdiqlaydi.

Xulosa. Xulosa qismida yuqoridagi bacha fikrni 3-4ta gap orqali ifoda etiladi va o‘quvchiga kerakli xulosa yetkazib beriladi.

Arab tilida xat yozish. Muayyan bir tilni o‘rganishda yozish ko‘nikmasining rivojlanganini anglatuvchi asosiy omillardan biri bu o‘sha tilda xat yoza olishdir. Chunki xat yozishda talabalar o‘g‘zaki nutq yordamida ifodalovchi gaplarini yozma ko‘rinishda ifodalaydi. Yozuvchi o‘zi haqida, oilasi, yashash joyi, o‘qish va ish joylari haqida ma’lumot beradi. Xat yozishda muayyan nutq namunalari va leksik birliklarini to‘g‘ri qo‘llay bilish juda muhim va xat ma’lum tartiblarga ko‘ra va mazmun jihatidan 2 turga bo‘lindi, bular shaxsiy va rasmiy xat. **Shaxsiy xatda** yozilish jahatidan rasmiy xatga nisbatan erkinroq fikr yuritish mumkin va shaxsiy gaplardan foydalanib xatni qiziqarli va mazmunli qilish mumkin. Shaxsiy xat quyidagi tartibga ko‘ra yoziladi:

1. Joy va sana. Xat yozilayotgan manzil va sana xatning eng avvalida aytib o‘tiladi.

2. Xat yo‘naltirilgan insoinning ismi. Xurmat bilan xat yozlayotgan insinning ismini yozib unga murojaat qilinadi. Ismdan avval uning kimligiga ishora qilish ham joiz. Masalan: صديقي العزيز احمد فاضلي

3. Salomlashuv. Chiroyli so‘zlar bilan xat yo‘naltirilgan shaxsga salom beriladi va undan hol ahvol so‘raladi.

4. O‘zi haqida qisqacha ma’lumot, ya‘ni o‘zidan so‘ralishi mumkin bo‘lgan savollarga qisqacha javob berib o‘tish mumkin.

5. Maqsadga o‘tish. Endi xat yozishdan maqsad nima ekani bayon qilinadi. Bu biron yaxshi yoki yomon xabarni yetkazish, tabrik yoki ta’ziya bildirish, biron narsani talab qilish bo‘lishi mumkin.

6. Mavzuga doir qo‘shimcha. Ya’ni yetkazilishi lozim bo‘lgan kerakli ma’lumotlar keltiriladi.

7. Maqsadni ta’kidlash.

8. Xayrlashuv va chiroyli tilaklar. Xatni yakunlash juda muhim. Yoqimli tilaklarni bildirgan holda xayrlashib xat yakunlanadi.

9. Xat yozuvchining ismi va kim ekanligi. Bu xatning ajralmas bo‘lagidir. Uni tashlab ketish katta xato.

Demak shaxsiy xat shu ko‘rinishda yozilar ekan. Shaxsiy xat leksikonida turli xil xayotda ko‘p foydalaniladigan ibora va so‘z birikmalaridan erkin foydalanilgan holda fikrni erkin bayon etish mumkin bo‘ladi.

Rasmiy xat. Bu hatning turi yozuvchidan rasmiylik, qat’iy belgilangan leksikon, talab yoki murojaatning aniqligini talab qiladi. Rasmiy xat biron davlat tashkiloti, shirkat yoki kompaniyalarga yoziladi. Uni ko‘rib chiquvchi xat yozuvchining masadini aniq tushunishi o‘ta muhim. Rasmiy xat quyidagi ko‘rinishda yoziladi:

1. Joy va sana. Xat qaysi davlatdan yoborilgani va qachon yozilgani muhim hisoblanadi.

2. Xatni qabul qiluvchi tashkilot yoki kompaniya nomi kiritiladi. Agar xatni qabul qiluvchining lavozimi yoki ismi aniq bo‘lsa ularni ham kiritish mumkin.

3. Qisqa salomlashuv. Xat rasmiy bo‘lganligi bois ortiqcha gaplar kerak emas.

4. O‘zi haqida qisqacha ma‘lumot. Tug‘ilgan joyi, tug‘ilgan sanasi va lavozimini aytib o‘tib ketish ham joiz bo ‘ladi.

5. Xat yozishdan asosiy maqsad. Rasmiy xat yozishdan asosiy maqsad ishga qabul qilishlarini so‘rash, davlat xizmatlarini talab qilish, biron narsadan shikoyat qilish va turli hil shaxsiy talablar bo‘lishi mumkin.

6. Turli takliflar (agar bo‘lsa).

7. Maqsadni qisqacha ta’kidlab o‘tish.

8. Xurmar va ehtirom ila xayrlashuv, ya’ni xatni qabul qilishgani uchun tashakkur bildirish va tez orada javob qaytrishlarini so‘rash.

9. Xat so‘ngida lavozim va ism qayta ta‘kidlab yozib qo‘yiladi.

Yuqorida rasmiy xat yozish tartibi ko‘rsatib berildi. Xat yozishda ushbu ketma-ketlikka amal qilish zarur.

Yozish ko‘nikasida talabalarda eng ko‘p uchraydigan xato va kamchiliklar. Arab tilini o‘rganayotgan talabalarning yozish ko‘nikmasida ko‘p takrorlaydigan xatolar mavjud. Ularni bartaraf etish uchun esa avva ular bilan tanishib chiqish lozim. Bu xatolar talabaning o‘ziga sezilmasligi mumkin, ammo e’tiborli bo‘lish shart. Quyida eng ko‘p tarqalgan xato va kamchiliklarning ro‘yxati:

1. Tartibsiz yozish. Bu albatta yozuvchidan avvalo fikrlarini bir joyga jamlab uni tartib bilan yozishni talab etadi. Va bu xato asosan shoshilib yozishda uchraydigan katta xatolardan biri hisoblanadi. Buni bartaraf etish uchun yozishni boshlashdan avval 5-10 daqiqa yaxshilab o‘ylab olish tavsiya etiladi.

2. Sinonim so‘zlardan foydalanmaslik. Insho yozishda doim bir hil so‘zlardan foydalanish yozuvchining arab tilidagi leksik bilimlari kam ekanini ko‘rsatadi. Shu sababli yozuvchi ma’nodosh sinonim so‘zlardan ko‘proq foydalanishi lozim.

3. Mavzudan chetga chiqish. Bu xato yozuvchining mavzuni yaxshi tushunmaganini anglatadi. Demak inshodagi barcha ma’lumotlar mavzu doirasida bo‘lishi lozim ekan.

4. Kreativlikning yetishmasligi. Insho yozishda o‘quvchida qandaydir ta’surot qoldirish juda muhim. Negaki mavzular dolzarb bo‘lganligi sabab, undagi fikrlar ham ko‘pincha bir hil bo‘ladi. Bundan chetlashish uchun yozuvchidan fantaziyani ishga solishi talab etiladi.

5. Strukturaviy xatolar. Gaplarni tuzishda so‘zlar ketma-ketligi to‘g‘ri bo‘lmaydi, kerakli iboralardan foydalanilmaydi va shu tariqa insho tushunarsiz bo‘lib qoladi. Buni bartaraf etishning yagona yo‘li ko‘proq insho yozish, so‘z boyligini oshirish, naxv va sarf qoidalarini o‘rganish.

6. Inshoni paragraflarga bo‘lmaslik. Insho qanchalik mazmunli va ko‘p so‘z boyligiga ega bo‘lmasin uni ma’no jihatidan paragraflarga bo‘lish shart, shunda insho o‘qilganda mazmun yaxshi tushuniladi va kerakli qismlar tez aniqlanadi.

7. Inshoni qiyinlashtirib yuborish va undagi xatolarning ko‘payib ketishi. Bunday vaziyatda talaba o‘z darajasiga ko‘ra ish tutishi lozim va yozilayotgan gaplarning to‘g‘riligiga ishonch xosil qilishi kerak.

Yozish ko‘nikmasi darajasining CEFR me’zonlari asosida taqsimlanishi.

	Yozma nutqni umumiy baholash
C2	Murakkab mavzularda ravon, aniqlik va samarali uslubda yozishi, asosiy fikrlarni topishga yordam beradigan mantiqiy tuzilishga ega bo'lishi mumkin.
C1	Murakkab mavzularni tushunarli bayon qilish, yaxshi tuzilgan matnlarni yozishi, muhim jihatlarni ta’kidlab, fikrlarni asoslab, misollar bilan to‘ldirib va mos xulosa bilan yakunlashi mumkin.
B2	Turli mavzularda aniq va batafsil matnlar yozishi, bir nechta manbadan olingan ma’lumot va dalillarni tahlil qilib, ularni umumlashtira olishi mumkin.
B1	Qiziqish doirasidagi tanish mavzular haqida oddiy, bog‘langan matnlarni yozishi, alohida qismlarni ketma-ket bog‘lab ifodalashi mumkin.
A2	Oddiy so‘z birikmalari va gaplardan foydalangan holda, ‘و’, ‘لكن’, ‘لأن’ kabi oddiy bog‘lovchilar bilan bog‘langan jumlalarni yozishi mumkin.
A1	Oddiy ajratilgan iboralar va jumlalarni yoza oladi.

	Ijodiy yozuv
C2	Qiziqarli, ravon va to‘liq hikoyalar hamda tajriba tasvirlarini, qabul qilingan janrga mos uslubda yozishi mumkin.
C1	O‘quvchini nazarda tutgan holda, ishonchli, shaxsiy va tabiiy uslubda aniq, batafsil, yaxshi tuzilgan va rivojlangan matnlar yozishi mumkin.
B2	Haqiqiy yoki xayoliy voqea va tajribalarni aniq, batafsil tasvirlab, g‘oyalar orasidagi bog‘liqlikni ko‘rsatgan holda, janr qoidalariga rioya qilgan holda yozishi mumkin. Qiziqish doirasidagi turli mavzularda aniq va batafsil matnlar yozishi mumkin. Film, kitob yoki spektakl haqida sharh yozishi mumkin.
B1	Tanish mavzular bo‘yicha aniq va batafsil tasvirlar yozishi mumkin. Oddiy bog‘liq matnda his-tuyg‘ularini va reaksiyalarini tasvirlab, tajribalar haqida yozishi mumkin. Haqiqiy yoki xayoliy voqealar yoki safar haqida hikoyalar yozishi mumkin.
A2	O‘z atrofi (insonlar, joylar, ish yoki o‘qish tajribasi) haqida bog‘langan jumlalarda yozishi mumkin. Juda qisqa, asosiy voqealar, o‘tgan faoliyat va shaxsiy tajriba haqida yozishi mumkin.
A1	O‘z oilasi, yashash sharoiti, ta’limi, hozirgi yoki oxirgi ishi haqida oddiy ibora va gaplar yozishi mumkin.

	Hisobot va esselar
C2	Murakkab, ravon yozilgan maqola, hisobot yoki insho yozishi mumkin, unda biror taklif yoki adabiy asar tanqidiy baholanadi. Muhim fikrlarni topishga yordam beradigan mantiqiy tuzilmani taqdim eta oladi.
C1	Murakkab mavzularni yaxshi tuzilgan, aniq tarzda yoritib, asosiy jihatlarni ta’kidlab yozishi mumkin. O‘z fikrlarini misollar, sabablar va tafsilotlar bilan asoslab kengaytirishi mumkin.
B2	Muhim fikr va mos dalillarni ajratib ko‘rsatgan holda, izchil tarzda insho yoki hisobot yozishi mumkin. Turli g‘oya yoki muammolarga yechimlarni baholay oladi.
B1	Qarshi yoki tarafdor fikrlarni sabablar bilan asoslab, turli variantlar afzallik va kamchiliklarini tushuntirib, fikr bildiruvchi hisobot yoki insho yozishi va turli manbalardan olingan axborot va fikrlarni umumlashtirishi mumkin. Qiziq mavzular bo‘yicha qisqa insho yozishi mumkin. O‘z sohasi doirasidagi ma’lumotlarni ishonch bilan umumlashtirishi, hisobot qilishi va fikr bildira oladi. Oddiy rasmiy formatda qisqa hisobot yozishi ham mumkin.
A2	Tavsif bayon qilinmagan.
A1	Tavsif bayon qilinmagan.

Xulosa. Matn yarata bilish, ayniqsa u chet tilida bo ‘lsa mushkul masala bo‘lishi mumkin. Buning asosiy sababi matnning tizimli bo ‘lishidir. Ko‘pchilik talabalar o‘z fikr va muloxazalarini tizimli ravishda tartibli bayon qila olmaydilar va bu muammoni bartaraf etmay turib insho yoki esse yoza olish ilojsiz. Agarda biron mavzuga matn yaratishda qiyinchiliklar bo ‘lsa bundan qutilishning yagona yo ‘li ko ‘proq matnlar (esse, insho, dialog, monolog, xat) yaratish. Yozish ko ‘nikmasini rivojlantirish uchun dangasaliklarsiz qunt bilan mashq qilish lozim va shu yo‘l bilan yetarlicha tajriba orttirish mumkin. Biroq yozish ko ‘nikmasini

rivojlantirish bilan bir qatorda mutolaani ham yodda tutish lozim. Bu yozish mahoratinin oshirishning poydevori hisoblanadi. Matn yaratish va uni tahrir qilish qanchalik qiyin bo ‘lmasin uni o ‘zlashtirish juda ham muhim. Shuni unutmaslik kerakki barcha narsaga faqatgina mehnat orqali erishish mumkin. Maqola faqatgina yozish tartibini va tahlil qilishni ko‘rsatib bera oladi, ammo eng keraklisi ko ‘nikma xosil qila olishdir.

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GILBERT'S SYNDROME: ETIOLOGY, CLINICAL MANIFESTATIONS AND DIAGNOSTIC APPROACHES

Abstract. *Gilbert's Syndrome (GS) is a common, benign hereditary disorder of bilirubin metabolism characterized by intermittent, mild unconjugated hyperbilirubinemia in the absence of liver disease or hemolysis. This review discusses the etiology, pathophysiology, clinical features, and diagnostic criteria of GS. Recent genetic findings, particularly the role of polymorphisms in the UGT1A1 gene, are examined. Despite being clinically insignificant in most cases, GS has implications for drug metabolism and differential diagnosis in jaundiced patients. Understanding its benign course helps avoid unnecessary interventions and misdiagnosis.*

Keywords: *Gilbert's syndrome, hyperbilirubinemia, UGT1A1, jaundice, hereditary disorders, bilirubin metabolism.*

Introduction. Gilbert's Syndrome (GS) is an autosomal recessive condition with reduced activity of the enzyme uridine diphosphate-glucuronosyltransferase 1A1 (UGT1A1), resulting in impaired conjugation of bilirubin [1]. It affects approximately 3–10% of the population globally, with higher prevalence in males. Often detected incidentally during routine blood tests, GS is generally considered benign but requires careful differentiation from more serious hepatic or hematological disorders [2].

Etiology and Pathophysiology. The root cause of GS lies in a genetic mutation—most commonly, an insertion of TA in the TATAA box of the UGT1A1 promoter region (UGT1A1*28 variant). This leads to reduced transcription and activity of the UGT1A1 enzyme, which is essential for conjugating bilirubin in hepatocytes [3].

Unconjugated bilirubin, being lipid-soluble, accumulates in the blood when the conjugation process is inefficient. However, other liver functions remain normal. Triggers for hyperbilirubinemia episodes include fasting, stress, illness, menstruation, and physical exertion [4,8].

Clinical Manifestations. Most individuals with GS remain asymptomatic. The hallmark clinical feature is intermittent jaundice, particularly scleral icterus, without hepatosplenomegaly or signs of chronic liver disease. Fatigue, mild abdominal discomfort, and malaise have been occasionally reported but are nonspecific and not always attributable to GS [5,10].

Importantly, GS can influence drug metabolism. Reduced UGT1A1 activity may impair clearance of drugs like irinotecan, leading to toxicities. This has

pharmacogenomic implications and supports the consideration of genetic testing before initiating such therapies [6,10].

Diagnostic Approaches. Diagnosis of GS is primarily clinical, supported by laboratory findings:

Persistently elevated unconjugated bilirubin levels, typically <6 mg/dL.

Normal liver enzymes (ALT, AST), complete blood count, and hemolysis markers.

A bilirubin fasting test may provoke a rise in bilirubin, confirming diagnosis.

Genetic testing for UGT1A1 variants confirms the diagnosis but is not routinely required [1, 4].

Differential diagnosis should exclude hemolytic anemias, hepatitis, Crigler–Najjar syndrome, and drug-induced liver injury.

Management and Prognosis. GS requires no treatment, as it does not lead to liver damage or long-term complications. Patient education is key to prevent anxiety and avoid unnecessary investigations. In rare situations where bilirubin rises significantly (e.g., during illness), reassurance is sufficient.

However, pharmacovigilance is needed when prescribing UGT1A1-metabolized drugs. Lifestyle modifications, including adequate hydration and avoidance of fasting, help minimize hyperbilirubinemia episodes [2, 6,9].

Conclusion. Gilbert's Syndrome is a benign metabolic disorder that is often overinvestigated due to jaundice. A clear understanding of its genetic basis, benign course, and minimal clinical significance helps in accurate diagnosis and avoids overtreatment. Awareness of its pharmacogenetic impact is growing, especially in oncology and hepatology.

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THE IMPORTANCE OF INVESTMENTS IN MANUFACTURING SECTORS

Abstract. *This study provides a comprehensive analysis of the importance of investment in manufacturing sectors. It highlights the role of investment in economic growth, job creation, technological innovation, and product competitiveness. The study also includes key mechanisms for attracting investment, factors affecting its effectiveness, and recommendations for improving the investment climate.*

Keywords: *Investment, manufacturing sectors, economic growth, innovation, competitiveness, investment climate.*

Introduction. In today's globalization environment, the importance of manufacturing industries in ensuring the sustainable development and competitiveness of any national economy is incomparable. These industries not only form the material and technical base of the country, but also play a decisive role in ensuring employment, increasing export potential and improving social welfare. Ensuring continuous growth in production, achieving rapid growth in product quality and volume is almost impossible without investments.

The purpose of this study is to deeply study the theoretical and practical significance of investments in manufacturing industries, assess their impact on economic growth, and develop scientifically based proposals and recommendations to improve the investment climate. This study is of great importance in the formation of investment policies aimed at increasing production potential and sustainable development of the national economy.

Research methodology. This study uses a comprehensive methodological approach to deeply study the significance of investments in manufacturing industries. It uses theoretical and statistical analysis methods to summarize the theoretical foundations of investments and analyze their impact on economic growth.

Analysis and results. This section provides a detailed analysis of the dynamics, structure and impact of investments in manufacturing sectors on economic indicators based on statistical data, tables and graphs. In accordance with the research methodology, the logical-comparative approach, statistical analysis and systematic approach methods were used in the analysis process, which allows for a deep understanding of the role of investments in the development of the sector

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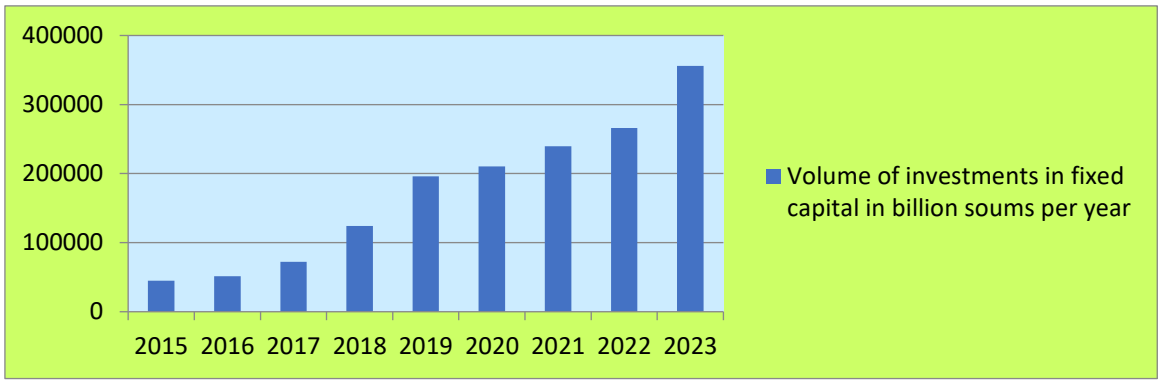

Figure 1. Analysis of the dynamics of investments in fixed capital (2015-2023)

The presented table reflects the dynamics of investments in fixed assets in Uzbekistan for the period from 2015 to 2023. These data demonstrate a stable and rapid growth trend in investment activity, which indicates the modernization and expansion of the country's economy.

As can be seen from the table, while in 2015 the volume of investments in fixed assets amounted to 44,810 billion soums, this indicator has been steadily increasing in recent years. In particular, significant growth rates have been observed since 2017. The volume of investments, which amounted to 72,155.2 billion soums in 2017, reached 124,231.3 billion soums in 2018, having almost doubled in a short period of time. It can be assumed that the economic reforms implemented during this period and measures aimed at improving the investment climate have borne fruit.

The growth rates have been maintained in subsequent years. In 2019, investments amounted to 195,927.3 billion soums, and in 2020, 210,195.1 billion soums. The fact that despite the pandemic conditions (in 2020), the volume of investments did not decrease, but continued to grow, indicates the resilience of the economy and the fact that the investment policy is in the right direction. In 2021, the volume of investments in fixed capital reached 239,552.6 billion soums, in 2022 - 266,240 billion soums, and finally, in 2023 - 356,071.4 billion soums. This growth is mainly due to the activation of public and private investments aimed at expanding production capacities, modernizing infrastructure, and introducing new technologies.

Table 1
Proposals for attracting investments to production sectors

№	Offer direction	Content of the offer	Expected result
1	**Improving the investment climate**	Expand tax incentives and preferences, strengthen legal guarantees for foreign investors, and reduce bureaucratic obstacles to doing business.	Increased foreign direct investment, increased attractiveness for local and foreign investors
2	**Supporting innovation**	Attracting public and private investments in scientific research and development (SRD), and encouraging the activities of technoparks and innovation centers	Increased production of high-tech and innovative products, increased competitiveness of industries
3	**Capacity building**	Improving the system of training qualified engineers, technologists, and workers for production sectors, introducing training and retraining courses for modern professions	Effective implementation of investment projects, increased production efficiency, and meeting the demand for a skilled workforce
4	**Infrastructure development**	Modernize and expand energy, transport and logistics infrastructure, and provide modern communications to production areas	Creation of favorable conditions for the placement of investment projects, reduction of costs, and increase in the efficiency of delivering products to the market
5	**Development of financial markets**	Expand access to long-term and affordable credit resources, and activate the activities of venture funds and other financial institutions	Improvement of mechanisms for financing investment projects, increased investment activity of small and medium-sized businesses
6	**Strengthening public-private partnerships**	Expanding mechanisms for cooperation between the public and private sectors in large infrastructure and manufacturing projects	Implement projects faster and more efficiently by reducing the burden on the state budget and attracting private capital and expertise

In general, the consistent growth in fixed capital investments during the analyzed period confirms the high attention paid to investment policy as a strategic priority of economic development in the country. This trend creates the basis for supporting economic growth rates and increasing the competitiveness of the national economy in the future.

An integrated approach is essential to stimulate investment in manufacturing sectors, and this process covers several key areas. First, it is necessary to increase the country's investment attractiveness by improving the investment climate. This will serve to attract foreign and domestic direct investment by strengthening tax incentives and legal guarantees and reducing bureaucratic barriers. Second, comprehensive support for innovation will increase the production of high-tech products and increase the competitiveness of industries by encouraging investments in technoparks and research. Third, it is very important to increase human resources for the effective implementation of investment projects; this includes improving the

system of training qualified engineers and workers and training in modern professions. Fourth, infrastructure development - modernization of the energy, transport and logistics sectors - will reduce production costs and increase investment attractiveness. Finally, expanding access to long-term and affordable credit resources through improving financial markets, as well as strengthening public-private partnerships, will significantly increase overall investment activity by attracting capital and expertise to large projects. This set of proposals will serve to ensure the sustainable development of production sectors.

Conclusion. Investments in manufacturing are the main drivers of economic growth, job creation, technological innovation, and product competitiveness. Research shows that by improving the investment climate, supporting innovation, increasing the capacity of qualified personnel, developing infrastructure, and improving financial markets, the effectiveness of investments in manufacturing can be significantly increased. In particular, strengthening public-private partnership mechanisms plays an important role in the implementation of large-scale projects. The steady growth of investment volumes and their increase in their share in production create a solid foundation for the future development of the sector. In general, pursuing a strategic investment policy is crucial for ensuring the sustainable and rapid development of the national economy.

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DISEASES OF THE MAMMARY GLAND RELY ON CLINICAL BELIES TO PERFORM ULTRASOUND

Annotation. *This is about the diseases that can occur in the mammary gland through the article and their clinical picture.Through the article, the clinical picture of diseases and their vision through ultrasound is about.The article provides insights into hormonal treatment,endocrine treatment.The article details the pathologies found in the mammary glands and mammary glands through comparative analysis.In the case of patients ,examinations were carried out with reference to their complaints, and the results were cited with reference to ultrasound and mammography, MRI findings.Ultrasound examination it is understood through this article How significant is and what causes early diagnosis.All diseases that occur in the mammary glands are highlighted in detail.Through this article,we will be able to find out the difference between cysts and malignant and non-malignant tumors.Differentiation through examination apparatus has also been cited.*

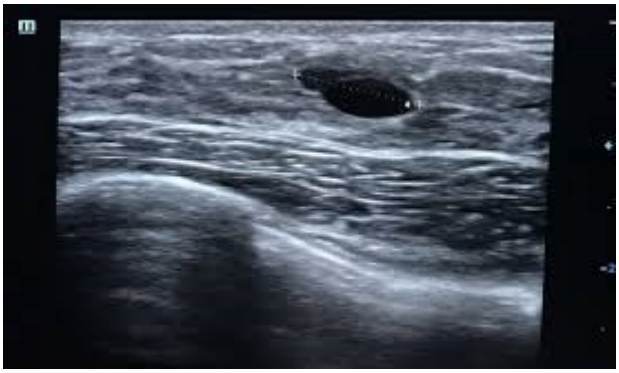
Keywords: *hormone, sucker, erythema ,pedigree,epidermoid cyst, skin, subcutaneous epithelium, estrogen,progestron, pain, mastalgia.*

Introduction

Safe mammary glands and changes in the mammary gland in various cases hormonal treatment-more hormonal treatment in women with more minapause and in women with ovarian and uterine diseases, various changes in the mammary gland are observed in exchange for the provision of substitute hormones i.e. The administration of estrogen and progestiron can be the cause. In women, the main sign of hormonal treatment is changes in the mammary gland in women who are being treated against various types of patients who use contraceptives in mammography and

ultrasound.Because the tissue of the mammary gland is sensitive to hormones, namely estrogen and progestrone.In mammography and ultrasound, women undergoing hormonal treatment can be seen to have condensed mammary tissue when they see the mammary gland, and even in some cases, flue changes are possible to be visible.The difference between these changes from other pathologies is when hormonal treatment is stopped changes disappear that is, it is a hormonal response to stimulation under the influence of temporary hormones.It is also necessary to assess the absence of tumors in the absence of changes in the ovaries.During the inspections, an observation was carried out on a 50-year-old woman.This female estrogen progestrone has been taking for a long time, and the limited changes in the mammary gland in the form in which the tumor changes are detected are ambiguous .On ultrasound, a hypoechogenic furnace structure is visible.The periphery is surrounded by hyperexogenous hoshia.The edges are oval with an uneven shape.Angular in appearance.Biopsy when there is hesitation to such dressings it is done, and this normal VES tissue turns out to be a sphere of proliferation.This condition was caused by the action of hormones.During the course of hormonal treatment in women, ostiyaporos is observed various changes mumkun.Ba in some cases, thromboembolic ischemic letters can be observed.Endocrine treatment- when estrogen progestrone is used when the mammary gland undergoes hormonal treatment , other hormonal priporates are also used in endrogen treatment.Patients are treated according to their complaint.The first complaint is the pain in the mammary gland. Other symptoms are hardening in the mammary gland,the arrival of various secretions from the mammary gland sucker,nipple pulling,swelling or jaundice,skin discoloration,rashes,scar changes,trauma,fever.These should be examined by ultrasound.If the patient is pregnant,breastfeeding,a man,a dressing is detected when palpating by hand,in children,ultrasound examination if there are small mammary glands goes to the main place.Ultrasound examination is also fundamental in mammagraphy when distinguishing whether the dressing is dangerously safe.The derivative in the gland can help determine if it is Cystic or Salic.The importance of ultrasound is also significant when again the secretions from the mammary gland come and there are tumors in the mammary gland.In ultrasound, several signs are given importance i.e. An assessment of tissue density exogeneity to the state of the coasts,blood flow,elasticity beriladi.So ' separations from the RG.According to the examination, the condition of the mammary gland tissue is considered when the separation from the pacifier comes.Self inseparable will not come, the tissue will be producing the inseparable.Such divorces can come from the Milky Way, the blood can be mixed or transparent.This condition will have to be treated as a pathology.It is necessary to check carefully,since the reason often turns out to be derivatives.Physiological separations ham comes from Norma do it from pathological separation the difference comes in two ways physiological ajralma.So ' when viewed from the outside of the tube, it is seen that a separation is coming out of several holes in the sucker.It can also be white yellow, which will be mostly shoffof.Again cases can also occur milk from the mammary gland can come in exchange for different

homogeneous hormonal changes.We call the arrival of such milk galactoria.Mammography sensitivity is considered low when examining the presence of detachment from the mammary gland.In mammography, it is possible to clarify up to 15-35%.On ultrasound, up to 80% of the information can be obtained.In MRI and ductography, determining the cause of separation arrivals occupies a high%.MRI will have 76% specificity with 92% sensitivity.In ductography, the sensitivity is 69% and the specificity is 39%.The reason for the low specificity is in ductography the constant arrival of the detachment during the examination kera if the arrival of the detachment has stopped, the detection rate will decrease.Therefore, the specificity will be lower.The last confirmation method when divorce comes is vacuum biopsy.Through this method, MRI gives a good result when there is no possibility of detection in mammagraphy.Of course the pathology that is the most responsible for the arrival of separation is that it occurs at the expense of papilomas, accounting for 48%.It also occurs in mammary tract ectasia,invasive carcinoma,ductal carcinoma.The reason for the arrival of bloody divorces in 25% of cases is in cancer.It is not necessary to leave the mammary gland when the serrosis comes to fluid and invalid when it comes to one-sided again.In galactoria, detachment comes in exchange for lactation, and it is necessary to exclude that there are no hormonal di sruptions.In 8% of women, the arrival of various divorces is observed, and if this is considered a physiological condition, the screening should be checked.If the pathology is considered, it will have to be sent for diagnostic examinations.The surgeon will have to stay under the supervision of a mammologist if the cause is not determined in diagnostic tests.MRI, ductography procedures should be carried out.Diagnostics 98% of cases that are unknown turn out to be safe 2% of cases are es arak chiqadi.So ' ring pull: can be pulled completely or to one side, joint with ariola can be pulled, suction capsize mumkin.So ' the rat remains invisible in mammography or appears pale.In the field of the mammary gland subariole, the appearance as the derivative stands beradi.Ba ' zan mammography may also appear similar to the one in which the mammary gland is pulled when the mammary gland is not inserted.Therefore, ultrasound examination is also considered important in the suction pull.During the examination, deformation and derivative-like structure can be seen in the milk ducts.The suction distance pulled by the derivative if the derivative is found must be measured.If the distance in the middle is greater than 1 cm, the sucker is not the reason for pulling and it will be necessary to look for other reasons.If the distance of 1 cm is in the range or the derivative is under the sucker the derivative with the sucker must be traced to the cohesion between Yani. Ladi.Ba the zan sucker does not pull causes an increase in size as well.Such a condition is caused by Pedigree disease deyiladi.So the condition of retraction can occur at the expense of safe and dangerous diseases.Following



different operas as an example of the safe cases and different in cases where conservative measures have been taken,dilation of the mammary tract can be caused by fat disease,mandor disease,suction in fat necrosis.In contrast, lobar carcinoma causes 26% suction drag.Invasive carcinoma, on the other hand, causes 17% suction drag.8% of crayfish settle under the sucker.About 2 cm of the suction cup will fit.In 92% of cases, however, it is located elsewhere'ladi.So ' it will be necessary to constantly look under the brooch even if it is not pulled.If over the years the formed brogan sucker pull, and this is two-sided is the norm.

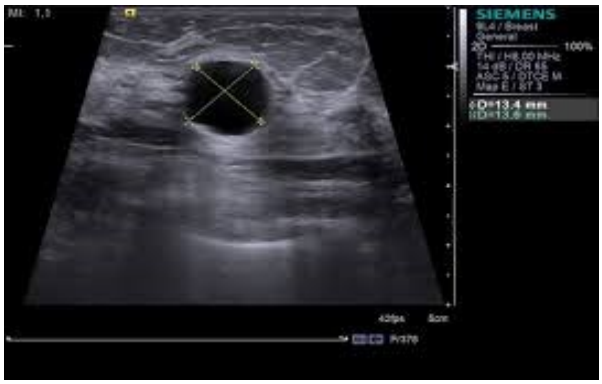
Literature analysis and methods.

It is safe.It can be a tumor if it is formed quickly on the contrary.Skin structures: identify tumors of various types of bumps on the skin.It is necessary to understand whether the various homogeneous structures on the skin depend on the mammary gland.Hos structures on the skin are located outside the parenchyma of the mammary gland.In mammagraphy, at least one pazisia will need to be located close to the skin.Most often, derivatives on the skin are safe.In cases where it is difficult to distinguish in mammagraphy, it is possible to distinguish through thomasentiz.More dangerous on the skin derivatives sebaceous gland cyst, epidermal cyst, sebarial cyst,sugal,hol,hemangioma,various scars, congenital changes occur.Various rakes and melanoma can occur.Epidermoid cyst: it is formed from the skin and subcutaneous epithelium.It is considered a safe cyst that arises from the closure of the hair follicle pathways.It is common around the mammary gland.In mammagraphy, the oval is spherical.Homogenous-looking ladi.Ba zan can enter a getirogenic appearance mainly located under the skin.At low points, the gland can slip to the area.On ultrasound, the oval will be spherical with which part will be adjacent to the skin. The Tiger will be in the form of a nail.This is how the enlarged part of the follicle becomes visible.Most often cystitis on ultrasound the derivative is determined and the liquid is heterogeneous in appearance.Around if inflammation is added There will be blood flow.Blood flow is not observed in the absence of inflammation.The reason why the form of floor matting occurs is keratin production.There are flat epithelia because and the accumulation of keratin looks like an onion pustine.Just like when cutting onions, the floor looks like a floor.Gepirexogenic.Epidermoid cysts will need to be differentiated from those in question: sebaceous gland cysts,mammtogameri gland cysts in Ariola, mammary gland derivatives and cancers we will have to distinguish.Birads 2 is inserted when the Epidermoid cyst is detectable and should be examined 2 times a year.A 60-year-old woman has had mammaplasty and has a scar 9 years ago, when an epidermoid cyst was detected.Sent to an ultrasound scan for clarification.On ultrasound, a cystic structure was detected in a case where the floor floor was immersed in pieces of fat in a position adjacent to the skin of a visible

hypoechogenic cystic derivative.Birads 3.When inflammation is added blood flow is inflammation if not added onion trimming look reflects visibility.Erythema is a redness that can occur more in the skin area or in the pacifier.In most cases, it is found in pregnant mammals.It occurs in young women, and on ultrasound, mainly the area of redness is surveyed.It can occur at the expense of inflammation,abscess,allergic reaction.Granulomatous mastitis can be followed by vacuuming in the limited area.Malignant tumors also sometimes have redness.There is an inflammatory cancer.In doing so, my organism triggers a protective reaction to the cancer and gives redness.These rakes grow quickly and grow large and when we look at the reddened area, the skin will look like an orange peel.At the time seen on ultrasound, the hepoichogenic derivative is detected.The rake will grow towards the skin and be directed towards the surrounding tissue.When the abscis is -, the 3sm gacha is punctured. Put drainage under ultrasound control from 3cm to adults yiladi.So ' redness can also occur on the rump itself, one of which may be pedigree disease.Adenomas may also occur.Other clinical signs also occur together in redness that occur at the expense of inflammation such as abscess,temperature and pain.

Results and discussion.

One of the main methods of examination in erythema(redness)is ultrasound.It is blind in juveniles.Patient 34-year-old woman complained to mammologist redness in the mammary gland according to the result of the examination tension in the scar area and uneven formation of the coasts identified.On ultrasound, the erythema area is visible in a geperexogenic view.There is deformity in the gland, and when a biopsy is performed,



it turned out to be a fat necrosis.It was biopsied for resembling a malignant tumor.Fat cysts are cysts that store fat in them and have a darker fat inside.It is considered safe and is characteristic of the skin and subcutaneous epithelium.It is mainly found in areas with skin folds,since in these areas the mouth of the sebaceous glands is easy to block.There will be fat cysts if the way of the sebaceous glands is blocked.If the path of the hair follicle is blocked, the epidermal cyst is formed.It can reach from 1cm to 10cm. Water pads can be used to differentiate these cysts.On ultrasound, the appearance is hypoexogenic-sometimes ezoexogenic images are also found.Fat will depend on the increase in thickness .There will be a way to keep the fatty acids adjacent to the skin;it will be the appearance of a “cat's nail.", "takes the form of an appearance.When inflammation is added epidermoid cysts like blood flow increases and blood flow is visible.We need to distinguish from Epidermoid cysts,cancers,papilomas.Treatment is without protection is not required.It is visible in places where there are many folds.Tightening the skin-a certain area on the skin is immersed in the workaround,looks like a hand-pressed one.Basically, postponing from the Opera occurs in scars.Distinguishing from cancers and carcinomas must.Asymmetry is visible in the gland.It can occur after trauma,mastetes and after

cancer.The reason is the Cooper boys, and if the cancer gets rich and attracts the skin in this place.There is also a good one skin tightness that helps to determine the diagnosis early.Women complain quickly.If observed in men it is dangerous it turns out to be 35% cancer.Skin thickening-skin thickening from 2mm is reduced.It has 2 homogeneous appearance.It will be diffuse and furnace.It is observed in patients with multiple surgeries,irradiated ones,trauma.Inflammations in this area in furnace thickening derivatives can be observed.Mouth-the most common.The women complain of one two-day pain that occurs before hayiz arrives.We can also call this pain cyclic pain.This pain is physiological apricot.Taking the 10-point sestima cyclic pains are 4 points.This is a moderate pain.Pain in the mammary gland is called mastalgia.Cyclic mastalgia- the pain begins mainly in the secretory phase and lasts up to 7 days.The Hayiz cycle continues until it ends.It continues until menapauza.It is best if hormonal treatment is done.Masyclic mastalgia is a pain that does not depend on the cycle and has one complete pain.In the cyclic, it is dual.Primarily in cyclic mastalgia, the painkiller occupies a square.In non-cyclic mastalgia, however, the furnace takes up the appearance. When patients complain about up to 30 years of age to ultrasound skin, and older than 30 years of age to mamaagraphy.It is then viewed at UZI.Determination of the cause of pain-pain rakes too gives less.Can give if you are getting bigger.Derivatives also cause pain when they become larger.There may also be pain in Mamdor disease (this is a disease of the mammary gland with veins), mastitis, in absis, trauma, other organ diseases, pain in the mammary gland area can be caused by erroding (often there are nerves)pain is mainly observed in pregnancy.Binary is not scary if the derivatives cause pain even if they get bigger.Fibroadinomas,for example,can occur in hepirplasias, mammary disease(enlargement of mammary gland veins)when the size of the rakes increases.70% of women experience pain in the mammary gland for the rest of their lives,but only 0.3% of women complain of pain.Edema and bulging-in such cases, the first priority is to exclude crayfish must.Diseases that cause tumors and bulges are much more common e.g.:rakes, cysts,pieces of fat .When palpated, the tumor is detected up to 4% cancer turns out.Vascular structures. Such structures will be safe and safe.We can introduce hemangiomas into such structures.To distinguish such derivatives from the cancer structure, a biopsy will be necessary.Venous malpharmacy is also located under the skin, resembling hemangioma.

Conclusion.

The difference is that if the hemangioma has Salic tissue, cysts are present in the malpharmacy.Well displaced and crushed when pressed.Angiolipomas are gepiexogenic mostly.Since there is a blood clot, it penetrates into the heterogeneous view.Mondor's disease trauma is caused after inflammations women often palpate

in the appearance of a snake footprint, which identifies the systems.In mammography, navel-expanded vessels are visible.There is pain when pressed.When we see the crush with the sensor will not crush because there will be a tromp inside.If milk is crushed.The skin color will be dark brown,tart.Occurs between the ages of 20-50 safe it will pass when treated.Thrombosis and inflammation occur together.

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YOSHLAR ORASIDA RAQAMLI ETIKA MADANIYATINING RIVOJLANISHI VA TA’LIM TIZIMIDA ROLI

Annotatsiya: *Ushbu maqolada yoshlar orasida raqamli etika madaniyatining rivojlanishi va ta’lim tizimida uning roli tahlil etiladi. Raqamli etika madaniyati ta’lim oluvchilarining internet resurslaridan foydalanishdagi mas’uliyatli yondashuvlarini shakllantirishga yordam beradi, bu esa ularning professional va shaxsiy rivojlanishiga ijobiy ta’sir ko‘rsatadi. Maqola, raqamli etika madaniyatining zamonaviy mehnat bozoridagi axloqiy va huquqiy normalarga muvofiqligini, shuningdek, ta’lim jarayonida muvaffaqiyatli qarorlar qabul qilish imkoniyatlarini oshirishdagi ahamiyatini batafsil ko‘rib chiqadi. Yoshlar o‘rtasida raqamli etikani rivojlantirish, ularga zamonaviy texnologiyalarni mas’uliyat bilan ishlatishga o‘rgatish, shuningdek, ularning ijobiy va salbiy ta’sirlarini aniqlashda yordam berishi muhimdir. Ushbu maqolaning maqsadi, raqamli etika madaniyatining shakllanishi orqali ta’lim oluvchilarning kasbga yo‘naltirishdagi samaradorligini oshirishga qaratilgan.*

Kalit so‘zlar:*Raqamli texnologiyalar, raqamli etika, risklar, raqamli transformatsiya, virtual texnologiyalari.*

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DEVELOPMENT OF DIGITAL ETHICAL CULTURE AMONG YOUTH AND ITS ROLE IN THE EDUCATION SYSTEM

Abstract: *This article analyzes the development of a digital ethics culture among young people and its role in the education system. A digital ethics culture promotes a responsible approach to the use of Internet resources by students, which has a positive impact on their professional and personal development. The article examines in detail the compliance of the digital ethics culture with the moral and*

legal norms of the modern labor market, as well as its importance in increasing the chances of making successful decisions in the educational process. It is important to develop digital ethics among young people, teach them to use modern technologies responsibly, and help them identify their positive and negative consequences. The purpose of this article is to improve the effectiveness of career guidance work for students through the formation of a digital ethics culture.

Key words: *Digital technologies, digital ethics, risks, digital transformation, virtual technologies.*

Ilm-fan va yuqori texnologiyalar jadal rivojlanib, to‘rtinchi sanoat inqilobi tomon olib borayotgan globallashuv davrida, har bir davlat uchun iqtisodiy, ijtimoiy, ma’naviy va siyosiy xavflarni oldindan bartaraf etish zarurati ortib bormoqda. Ushbu jarayonda rivojlangan davlatlarga intellektual qaramlikdan himoyalanish har bir davlatning eng asosiy strategik vazifalaridan biridir. Raqamli texnologiyalarning kengayishi bilan birga, yosh avlodning raqamli etika madaniyatini shakllantirish, ularning mas’uliyatli va ongli raqamli muhitda faoliyat yuritishlarini ta’minlash muhim ahamiyat kasb etadi. Ta’lim tizimi bu jarayonda markaziy rol o‘ynaydi, chunki u yoshlarni raqamli vositalardan foydalangan holda axloqiy va huquqiy normalarga muvofiq tarzda yo‘naltirishga qodir. Raqamli etika madaniyatining rivojlanishi, yoshlarni zamonaviy texnologiyalarning ijobiy va salbiy ta’sirlarini anglashga, shuningdek, ularning shaxsiy va professional hayotlarida mas’uliyatli qarorlar qabul qilishlariga yordam beradi. Shu nuqtai nazardan, ushbu maqola yoshlar orasida raqamli etika madaniyatining rivojlanishi va ta’lim tizimidagi o‘rni, uning jamiyatdagi ijtimoiy va iqtisodiy taraqqiyotga qo‘shgan hissasini o‘rganishga qaratilgan. O‘zbekiston, globallashuv jarayonining bevosita ishtirokchilaridan biri sifatida, bu oqimdan chetda turish imkoniyatiga ega emas. Har bir mamlakat bu jarayondan ijobiy manfaatlanishi va uning salbiy oqibatlari hamda xavf-xatarlaridan himoyalanishi zarur. Yurtimizda inson kapitalini rivojlantirish va 2030 yilga qadar innovatsion rivojlangan ellikta mamlakat qatoridan o‘rin egallash maqsadida, Innovatsion rivojlanish vazirligi tomonidan 2021–2022 yillarda O‘zbekiston Respublikasida sun’iy intellektni rivojlantirish strategiyasi loyihasi ishlab chiqildi. Ushbu strategiya, raqamli texnologiyalar va sun’iy intellekt imkoniyatlarini samarali qo‘llashga qaratilgan bo‘lib, yosh avlodning raqamli etika madaniyatini shakllantirishni ham o‘z ichiga oladi [1].

Raqamli etika madaniyati, yoshlar orasida mas’uliyatli raqamli muhitni yaratish va axloqiy normalarga amal qilishni ta’minlashda muhim ahamiyatga ega. Ta’lim tizimi, bu jarayonda markaziy rol o‘ynab, yoshlarni raqamli vositalardan foydalanishda ongli va mas’uliyatli yondashuvni o‘rgatishi kerak. Raqamli etika madaniyatining rivojlanishi, yoshlarni zamonaviy texnologiyalarni ijobiy va salbiy ta’sirlarini anglashga yordamlashadi, bu esa ularning shaxsiy va professional hayotlarida muhim qarorlar qabul qilish qobiliyatini oshiradi. Shunday qilib, O‘zbekistonning raqamli etika madaniyatini rivojlantirishga qaratilgan sa’y-harakatlari, nafaqat yosh avlodning professional tayyorgarligini kuchaytiradi, balki mamlakatning global raqobatbardoshligini ham ta’minlaydi.

Strategiya loyihasida sun’iy intellekt sohasida milliy ilmiy tadqiqot va rivojlantirish faoliyatini tizimli tarzda yo‘lga qo‘yish hamda ta’limni samarali isloh etish asosiy maqsad etib belgilandi.Ushbu sohada 2021-2022 yillar uchun sun’iy intellektni rivojlantirishning fundamental asoslarini ishlab chiqish va maqsadli tizimlashtirish vazifalari belgilandi. Unda sun’iy intellektni rivojlantirishning asosiy ustuvor yo‘nali-shlarida ilmiy tadqiqotchilik faoliyatini tizimli tarzda tashkil etish, sun’iy intellekt sohasida ta’lim sohasini samara-li isloh etish hamda ilm-fan va ta’limda xalqaro hamkorlikni jadallashtirish ko‘zda tutilgan.

Axborot texnologiyalari yordamida mamlakat iqtisodiyotini rivojlantirish, global chaqiruvlarga ratsional yechimlar to‘plamini taklif etish va kadrlarning ilmiy hamda intellektual salohiyatini oshirishda 2021-2022 yillar uchun O‘zbekistonda sun’iy intellektni rivojlantirishning to‘rtta asosiy ustuvor yo‘nalishi belgilandi.

Ular meyoriy-huquqiy va axloqiy mu-nosabatlarda fundamental asos larni tartibga solish, axborotlashgan jamiyatni bosqichma-bosqich shakllantirish, kadrlar tayyorlashda ta’lim islohotlari va il-miy tadqiqot faoliyatini rag‘batlantirish, raqamli mahsulotlarni ishlab chiqarishni qo‘llab-quvvatlash va smart industriyadir. O‘zbekiston Respublikasida IT ni rivojlantirish strategiyasi loyihasida ko‘zlangan maqsad va vazifalarning amalga oshirilishi mamlakati-mizning xalqaro maydondagi ilmiy-texnik va innovatsion faoliyatidagi nufuzini oshirishda asosiy omillardan biri bo‘lib xizmat qiladi [2].

Axborot texnologiyalari va avtomatlashtirish jamiyatimizni sezilarli darajada o‘zgartirib, unga ta’sir ko‘rsatmoqda. Raqamlashtirish va yangi texnologiyalar ilmining konvergensiyasi katta iqtisodiy, ijtimoiy va antropologik o‘zgarishlarning asosi hisoblanadi[69]. Axborot texnologiyalarining oltmish yillik rivojlanishidan so‘ng jamiyat internetdan keng foydalanish, katta ma’lumotlar, kompyuter sohasi, sensor tarmoqlar, miya fanlari va boshqa innovatsion texnologiyalar, shu jumladan sun’iy aql. Ilmiy-texnika taraqqiyoti, iqtisodiy va ijtimoiy shart-sharoitlarning o‘zgarishi axborotning sun’iy rivojlanishi uchun zarur shart-sharoitlarni yaratdi. Hozirgi vaqtda sun’iy intellekt usullari texnologik yangiliklarga hissa qo‘shib, bilimlarning tegishli sohalariga kirib bormoqda. Axborot texnologiyalaridan keng foydalanish ta’lim, sog‘liqni saqlash va tibbiyot, ijtimoiy boshqaruv, atrof-muhitni muhofaza qilish, shahar va fazoviy sohalarda zarur rejalashtirish, sud va huquqni muhofaza qilish organlari, bu odamlar turmush darajasini yaxshilashga hissa qo‘shadi [3].

Muammoli sohalardan biri raqamli kosmosdagi etika, kiberetika, raqamli etika, bu, ayniqsa, sun’iy aql texnologiyalaridan foydalanishning ko‘payib borayotganiga e’tibor qaratib dolzarbdir. Kiberetika - bu kompyuterlar bilan bog‘liq, foydalanuvchi xulq-atvorini qamrab olgan, kompyuterlar nimalarga dasturlashtirilgan va u qanday ta’sir ko‘rsatadigan falsafiy sohadir shaxslar va butun jamiyat.Kiber etika sohasi, qoida tariqasida, Internet tarmog‘ida odamlarning shaxsiy shaxsiy ma’lumotlarini tarqatishning to‘g‘riligi, foydalanuvchilarni bila

[69] Bloommart T., Bruk C. To‘rtinchi sanoat inqilobi biznes.Qanday qilib raqobatlashing ishlab chiqish davri va yagonalik. – M.: Alpina Nashrga tayyorlovchi, 2019. – 204 s.

turib yolg‘on ma’lumotlardan himoya qilish, qulaylik axborot resurslari, intellektual raqamli huquqlar, raqamli ma’lumotlarga egalik qilish va ularni himoya qilish.

Raqamli texnologiyalarning diffuziyasi va ular taqdim etayotgan muayyan etik qiyinchiliklar bilan tashkilotlardan etik majburiyatlar , ijtimoiy mas’uliyat va tashkiliy qadriyatlar qaysi raqamli imkoniyatlardan foydalanish lozimligini va ularni amalda qo‘llashni belgilovchi mezon sifatida. Mutaxassislar raqamli xizmatlar teng asosda adolatli va qulay bo‘lishi, jismoniy va ruhiy salomatlikka hissa qo‘shishi kerak, degan fikrni bir necha bor bildirganlar, integratsiyalashuvi va ijtimoiy foydali foydalanishga qaratilgan. Raqamli texnologiyalar tomonlar manfaatlariga ishonchni mustahkamlashi kerak. Kompaniyalar raqamli etika, mas’uliyat, xodimlarga adolat , etika va xavfsizlik prinsiplarini integratsiya qilish kabi eng yaxshi amaliyotlar bo‘yicha ta’lim berish madaniyatini yaratishlari kerak mahsulot yoki xizmatning hayotiy aylanishi, shuningdek yuqoridan va qo‘llab-quvvatlovchi samaradorlikni boshqarish tizimlarining kuchli qo‘llab-quvvatlashi orqali istalgan xatti-harakatni rag‘batlantirish.

Raqamli etika - texnologiyaning odamlarning siyosiy, ijtimoiy va axloqiy mavjudligini qanday shakllantirishi va belgilashini o‘rganadigan o‘rganish sohasi. Raqamli etika yoki axborot etikasi raqamli axborot-kommunikatsiya texnologiyalarining (ICT) jamiyat va atrof-muhitga ta’siri bilan yanada kengroq shug‘ullanadi umuman olganda[70].

Ta’lim oluvchilarni kasbga yo‘naltirish jarayonida raqamli etika madaniyatining ahamiyati juda katta. Bugungi kunda, raqamli texnologiyalarning jadal rivojlanishi, ularning ta’limdagi o‘rni va ta’siri, foydalanuvchilardan ma’naviy va axloqiy mas’uliyatni talab etadi. Raqamli etika madaniyati, ta’lim oluvchilarga internet va axborot texnologiyalaridan foydalanishda to‘g‘ri va mas’ul yondashuvni shakllantirishga yordam beradi.Ta’lim oluvchilarning raqamli muhitdagi munosabatlari, axborotni qayta ishlash, xuquqiy normalarni hurmat qilish, shunchaki texnologiyalarni qo‘llashdan emas, balki ularning ijobiy va salbiy ta’sirlarini hisobga olishni talab etadi. Raqamli etika madaniyati, ta’lim oluvchilarga jamiyatdagi raqamli transformatsiyaning ijobiy yo‘nalishlarini aniqlash va ulardan samarali foydalanish imkonini beradi.Shuningdek, raqamli etika madaniyati, ta’lim oluvchilarni kasbga yo‘naltirishda muvaffaqiyatli va samarali qarorlar qabul qilishga yordam beradi. Ushbu madaniyat, zamonaviy mehnat bozoridagi talablarga mos ravishda, foydalanuvchilarning shaxsiy va professional rivojlanishini ta’minlashda muhim rol o‘ynaydi[4, 5, 6].

Xulosa qilib aytganda, raqamli etika madaniyati ta’lim oluvchilarni kasbga yo‘naltirish jarayonida faqatgina texnologiyalardan foydalanishda emas, balki ularning ijobiy ta’sirini barqarorlashtirishda ham muhim ahamiyatga ega. Raqamli etika, yoshlarning axborot va kommunikatsiya texnologiyalari bilan ishlash qobiliyatini shakllantirish orqali, ularga zamonaviy mehnat bozorida muvaffaqiyatli faoliyat yuritish imkoniyatlarini yaratadi.Ushbu madaniyatni shakllantirish, kelajak

[70]Raqamli mas’uliyat va etikaga egalik qilish. Raqamli davrda xavfning kelajagi. https://www2.deloitte.com/us/en/pages/advisory/articthe/ raqamli-etimologiya.html

avlodning kasbiy va shaxsiy rivojlanishida katta ahamiyat kasb etadi, chunki u yoshlarni raqamli muhitdagi axloqiy va huquqiy normalarga muvofiq harakat qilishga o‘rgatadi. Raqamli etika madaniyati, shuningdek, yoshlarning ijtimoiy mas’uliyatini oshiradi va ularni axborot xavfsizligi, shaxsiy ma’lumotlarni himoya qilish va raqamli izlarni boshqarish kabi muhim masalalarda ongli qarorlar qabul qilishga tayyorlaydi.Shu sababli, ta’lim tizimida raqamli etika madaniyatini rivojlantirishga qaratilgan chora-tadbirlar, nafaqat individual shaxslar uchun, balki butun jamiyat uchun ijtimoiy va iqtisodiy taraqqiyotga xizmat qiladi. O‘zbekistonning raqamli etikani rivojlantirish bo‘yicha strategiyalari, yoshlarni global raqobatga tayyorlashda muhim omil bo‘lib qoladi.

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THE ROLE OF THE INFORMATION-EDUCATIONAL ENVIRONMENT IN ACQUIRING HISTORICAL KNOWLEDGE: AN EXPERIMENTAL-RESEARCH APPROACH

Abstract: *This article examines the effectiveness of using an innovative information-educational environment in the teaching of world history. The study is based on experimental-research work conducted at the university level, aiming to determine how digital tools and interactive platforms enhance students' acquisition of historical knowledge. The paper discusses methodological strategies applied in experimental groups and compares outcomes with traditional instruction. Results indicate a significant improvement in students' engagement, analytical thinking, and retention of historical facts. Recommendations for integrating ICT into history teaching are also provided.*

Keywords*: historical knowledge, information-educational environment, digital pedagogy, world history, teaching methodology, experimental research, ICT in education*

Introduction

In the digital age, the integration of information and communication technologies (ict) into the educational process is not only a modern trend but a pedagogical necessity. The rapid evolution of digital tools has significantly transformed traditional teaching methods, providing educators with new opportunities to enhance the quality, accessibility, and interactivity of education. This transformation is particularly relevant in the field of humanities, where subjects like history often require innovative approaches to engage students and develop their intellectual abilities. [1]

History education is inherently complex, as it involves the understanding of chronological events, causal relationships, diverse perspectives, and cultural contexts. Traditional lecture-based methods, while still valuable, may not always meet the demands of today's digitally native students, who are accustomed to dynamic and interactive forms of content consumption. Therefore, the implementation of an information-educational environment (iee)—which integrates multimedia resources, virtual simulations, interactive maps, timelines, and digital archives—offers a more engaging and effective means of teaching historical content.

Furthermore, the development of students' critical and historical thinking is a key objective in modern history education. An iee allows learners to analyze primary sources, participate in virtual debates, and conduct independent research using credible digital databases. These activities foster analytical skills, historical

empathy, and the ability to evaluate multiple viewpoints, all of which are essential for cultivating informed and responsible global citizens. [2]

This paper explores how an information-educational environment contributes to the effective teaching of world history through the lens of experimental research conducted at the higher education level. The research investigates how the use of ict tools and digital learning platforms affects students' motivation, comprehension, and retention of historical knowledge. The study also seeks to identify practical strategies and methodological frameworks for history teachers aiming to implement digital pedagogy in their classrooms.

In doing so, the article highlights both the pedagogical advantages and the potential challenges associated with digital transformation in history education. Ultimately, it aims to provide evidence-based recommendations for the successful integration of information-educational environments into the curriculum, ensuring that history teaching evolves in line with 21st-century educational demands.

The information-educational environment (iee) is defined as a complex system of digital, multimedia, and interactive tools used to support learning. It allows teachers to create visually engaging and content-rich materials, enhancing the traditional learning experience. This section reviews relevant literature on the application of ict in history education, highlighting its potential to foster better understanding and long-term retention of historical knowledge.

Methodology of the experimental research

The experimental research was conducted to assess the effectiveness of utilizing an information-educational environment (iee) in the process of teaching world history. The study followed a structured methodology and was implemented in three sequential stages: **diagnostic**, **formative (experimental)**, and **analytical (evaluative)**. [4]

1. Diagnostic stage

The initial phase involved identifying the baseline knowledge and skills of the students with respect to historical content and cognitive competencies. A comprehensive **pre-test** was administered to both the control and experimental groups. This test assessed students' understanding of key historical concepts, their ability to analyze historical events, and their retention of factual knowledge. In addition to the pre-test, a **questionnaire** was distributed to determine students' attitudes toward history as a subject, their familiarity with digital learning tools, and their learning preferences. The results from this stage provided a foundation for designing targeted interventions in the next phase.

2. Formative (experimental) stage

In the second stage, the information-educational environment was systematically introduced in the experimental group over the course of several weeks. The digital components used included:

- **Virtual timelines** to visualize chronological sequences of historical events;
- **Historical simulations and role-playing games** to immerse students in historical scenarios;
- **Video lectures and documentaries** to provide multimedia-based content;

• **Interactive quizzes and online discussions** to reinforce learning and promote engagement;

• **Digital archives and online databases** to enable research-based learning. [5]

Instruction was designed based on constructivist pedagogy, encouraging student-centered learning and critical inquiry. Students worked both individually and collaboratively, often engaging in group tasks that required the analysis of historical sources and problem-solving in context.

Meanwhile, the control group continued with conventional teaching methods such as textbook readings, lectures, and note-taking. The instructional time, learning objectives, and topics covered were identical across both groups, ensuring that the only variable was the mode of content delivery.

3. Analytical (evaluative) stage

In the final phase, the impact of the instructional approaches was evaluated through **post-tests** administered to both groups. These tests mirrored the structure and content of the pre-tests but also included open-ended analytical questions to assess higher-order thinking skills. In addition to cognitive assessments, **student surveys** were used to gather feedback on their learning experience, engagement levels, and perceived effectiveness of the digital tools used in the experimental setting. [6]

The collected data were analyzed using both quantitative (statistical analysis of test results) and qualitative (content analysis of student reflections and survey responses) methods. Comparisons between the experimental and control groups were made to identify significant differences in learning outcomes, thus validating the effectiveness of the information-educational environment in teaching world history.

Results and discussion

The results of the experimental research clearly demonstrate the pedagogical advantages of integrating an information-educational environment (iee) into the teaching of world history. Students in the experimental group—who were exposed to a variety of digital learning tools and interactive content—achieved significantly higher academic performance than their peers in the control group. On average, the test scores of the experimental group improved by **25–30%** compared to baseline results, while the control group showed only marginal gains of **8–12%**.[7]

Beyond the improvement in test scores, several qualitative enhancements were observed in the experimental group's learning behavior. Firstly, active student participation during lessons increased noticeably. Learners engaged more willingly in classroom discussions, asked critical questions, and demonstrated greater curiosity about historical topics. This can be attributed to the visually rich and interactive nature of the digital content, which stimulated interest and made complex historical narratives more accessible and relatable.

Secondly, students in the experimental group exhibited improved skills in historical analysis. Through activities such as working with digital archives, analyzing historical documents, and participating in virtual role-plays, they

developed stronger abilities to interpret sources, distinguish between primary and secondary evidence, and draw conclusions based on historical context. These cognitive gains reflect a shift from surface-level memorization to deeper conceptual understanding of historical processes and events.

Additionally, the data collected from post-intervention surveys and reflections indicate that students developed a more positive attitude toward history as a subject. Many participants reported that the digital tools made learning more enjoyable and relevant to their daily lives. The flexibility of accessing resources both in class and at home also supported personalized learning paths, allowing students to learn at their own pace and revisit materials as needed.

From a methodological standpoint, the experimental approach confirmed that integrating iee into the history curriculum not only improves knowledge retention but also contributes to the development of 21st-century competencies, such as digital literacy, critical thinking, and self-directed learning. These competencies are essential for modern learners who must navigate and analyze vast quantities of information in both academic and real-world contexts.

Despite these positive outcomes, the study also revealed certain **limitations**. For example, the success of the digital approach depended heavily on the availability of reliable internet access, the digital competence of teachers, and the consistent functionality of technological infrastructure. Where these elements were lacking, the learning process faced interruptions and inconsistencies. These findings suggest that effective implementation of iee requires not only well-designed digital content but also institutional support and teacher training. [8]

In summary, the results of this study confirm that the strategic use of an information-educational environment can substantially enhance the teaching and learning of history. It fosters a more engaging, interactive, and student-centered classroom experience. These findings provide a strong argument for educational institutions to invest in the digital transformation of humanities education and support the widespread adoption of innovative teaching models.

Despite the positive results, certain challenges such as limited digital infrastructure, teachers' lack of training, and resistance to new technologies were observed. The study recommends targeted professional development for history teachers and investment in digital resources to facilitate wider adoption of iee in schools and universities.

Conclusion

The integration of an information-educational environment (iee) into the process of teaching world history has been shown to be an effective and transformative approach to improving both the quality and outcomes of historical education. The experimental findings presented in this study provide compelling evidence that the use of digital tools, multimedia content, and interactive platforms not only enhances students' acquisition of historical knowledge but also significantly increases their engagement, motivation, and analytical thinking skills.

Through the application of a structured experimental-research methodology, it was demonstrated that learners exposed to iee-based instruction outperformed

their peers in the control group across several key dimensions: test performance, participation in class activities, critical evaluation of historical sources, and independent learning. These outcomes suggest that when appropriately implemented, ict-supported history education can shift the learning experience from passive content reception to active and inquiry-driven exploration of historical phenomena. [9]

Moreover, the use of digital environments enables a personalized and inclusive learning experience, accommodating different learning styles and paces. It empowers students to take ownership of their learning process, engage with authentic historical materials, and develop essential 21st-century skills such as digital literacy, critical thinking, and collaborative problem-solving.

The implications of these findings are significant. They point to the urgent need for educational institutions to systematically integrate iee into their curricul**a**, not as a supplementary option, but as a core component of teaching and learning strategies in the humanities. This integration requires strategic planning, professional development for educators, infrastructure investments, and the creation of high-quality, curriculum-aligned digital resources.

At the same time, it is important to acknowledge and address challenges such as unequal access to technology, varying levels of digital readiness among teachers, and the need for pedagogical reorientation. Future research should continue to explore scalable models for the sustainable implementation of iee in diverse educational settings and investigate its long-term effects on student learning trajectories.

In conclusion, the successful use of an information-educational environment in this study reaffirms its potential to modernize history education and make it more engaging, effective, and relevant to today's learners. As global education systems continue to evolve in response to technological advancements, the integration of iee stands as a key driver for pedagogical innovation and excellence in the teaching of world history.

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RAQAMLI RESURSLARDAN FOYDALANISH: TA’LIMDA INNOVATSIYALAR VA TA’LIM SAMARADORLIGI

Annotatsiya:*Ta’lim samaradorligini oshirishda raqamli resurslardan foydalanish zamonaviy ta’lim jarayonida muhim ahamiyatga ega.Raqamli resurslar o‘quv jarayonini yanada samarali, individuallashtirilgan va interaktiv qilish imkonini beradi.Ushbu maqolada raqamli resurslardan foydalanish bosqichlari, ularning ta’lim sifatini oshirishdagi roli va ta’limda innovatsiyalarni qo‘llashdagi ahamiyati tahlil qilinadi.Raqamli texnologiyalarning jadal rivojlanishi pedagogik yondashuvlarga innovatsion yechimlarni joriy etish imkonini beradi.Maqolada raqamli resurslarning ta’lim jarayonidagi samaradorlikni oshirishga xizmat qiluvchi turli uslublari va vositalari yoritiladi.Shuningdek, raqamli resurslar yordamida o‘quv jarayonini individualizatsiya qilish, o‘qituvchi va o‘quvchi o‘rtasidagi o‘zaro ta’sirni kuchaytirish imkoniyatlari ham tahlil qilinadi.*

Kalit so‘zlar: *Axborot texnologiyalari, ta’lim samaradorligi, interaktiv ta’lim, innovatsion yechimlar, pedagogik yondashuvlar, o‘quv jarayoni, ta’lim sifatini oshirish.*

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DEVELOPMENT OF DIGITAL ETHICAL CULTURE AMONG YOUTH AND ITS ROLE IN THE EDUCATION SYSTEM

Abstract: *The use of digital resources in improving the efficiency of education is of great importance in the modern educational process. Digital resources make the learning process more efficient, individualized and interactive. This article analyzes the stages of using digital resources, their role in improving the quality of*

education, as well as their importance in the application of innovations in education. The rapid development of digital technologies allows us to introduce innovative solutions into pedagogical approaches. The article highlights various methods and tools of digital resources that serve to improve the efficiency of the educational process. It also analyzes the possibilities of individualizing the learning process and enhancing the interaction between the teacher and the student using digital resources.

Key words: *Information technologies, educational efficiency, interactive learning, innovative solutions, pedagogical approaches, educational process, improving the quality of education.*

Ta’lim samaradorligini oshirish zamonaviy jamiyatning asosiy maqsadlaridan biri bo‘lib, bu jarayonda raqamli resurslardan foydalanish muhim ahamiyat kasb etmoqda.Raqamli resurslar ta’lim jarayoniga ilg‘or usullar va vositalarni joriy etish orqali o‘quvchilarning bilim va ko‘nikmalarini samarali ravishda rivojlantirishga xizmat qiladi.Ushbu maqolada ta’lim samaradorligini oshirishda raqamli resurslardan foydalanish bosqichlari tahlil qilinib, ularning har birining o‘ziga xos xususiyatlari va ahamiyati yoritiladi.

Raqamli texnologiyalarning jadal rivojlanishi ta’lim sohasidagi innovatsion yechimlar va yangi pedagogik yondashuvlarni amalga oshirishga imkon yaratadi. Raqamli resurslar yordamida o‘quv jarayonini individualizatsiya qilish, o‘qituvchi hamda o‘quvchi o‘rtasidagi o‘zaro ta’sirni kuchaytirish, shuningdek, ta’lim mazmunini yanada boyitish imkoniyatlari ham ko‘rib chiqiladi. Maqolada raqamli resurslarning ta’limdagi innovatsion roli, ularning ta’lim sifatini oshirishdagi ahamiyati va o‘qituvchilarning raqamli kompetentligini rivojlantirish masalalari ham o‘rganiladi [1].

Respublikamiz ta’lim tizimida kadrlar tayyorlashning milliy dasturi bosqichma-bosqich amalga oshirilmoqda. Ta’lim jarayonida milliy dasturning dastlabki ikki bosqichi bajarilishini tahlil etish va bu davrlardagi to‘plangan tajribalarni umumlashtirish asosida mamlakatimizning istiqboldagi ijtimoiy-siyosiy rivojlanishiga mos bo‘lgan kadrlar tayyorlash tizimini takomillashtirish va uni yanada rivojlantirishdek dolzarb muammolarni yechish hozirda vazifa qilib qo‘yilgan.

An’anaviy ta’lim metodikasi yutuq va kamchiliklarini tahlil qilish undagi boy pedagogik tajriba va g‘oyalardan unumli foydalangan holda zamonaviy pedagogik texnologiyalar asosida respublikamiz ta’limiga mos bo‘lgan yangi pedagogik texnologiyalarni yaratish borasida tadqiqotlar olib borilmoqda.Ta’lim tizimida o‘qitish mummolarini o‘rganish va ularni tahlil qilish natijasida, o‘qitiladigan barcha fanlar va o‘quv predmetlari insoniyatning kamolga yetishi yo‘lida o‘zining kuchli tarbiyaviy imkoniyatlarini ishga solishi lozimligi, bu esa ta’limni rivojlantirish orqali ro‘yobga chiqishi va shu boisdan ham o‘quv jarayonini rivojlantirish orqali ta’lim va tarbiyada ko‘zlangan maqsadga erishish mumkin [2].

Fan va texnikaning rivojlanishi hozirgi kunda uzluksiz ta’lim tizimini, jumladan, uning tamoyillari, mazmuni, ta’lim -tarbiya jarayoni tubdan isloh qilishni

taqazo etmoqda. Bunday muammolardan biri bu ta’lim jarayoniga yangi axborot texnologiyalarining qo‘llanilishidir.

O‘quv jarayoniga kompyuter texnologiyalarining qo‘llanilishini asosan ikki yo‘nalishda olib borish mumkin: kompyuter-o‘rganish obyekti va o‘qitish vositasi sifatida. Birinchidan bilim va ko‘nikmalarni o‘zlashtirish jarayonida kompyuter imkoniyatlarani tushunish va kompyuter savodxonligini oshrishga olib kelsa, ikkinchidan kompyuter bilim berishning samaradorligini oshiradigan vosita xisoblanadi.

Yangi axborot texnologiyalarining yaratilish dinamikasi beshta bosqichdan iborat:

- dars jarayonida qisman foydalanishga mo‘ljallangan dasturlarning paydo bo‘lishi (bu bosqich o‘tdi);
- dasturlardan jadal foydalanish, sistemalashtirish, to‘planagan ma’lumotlarni baholash, tajribalar o‘tkazish, kelajakni va imkoniyatlarni baholashni tanqidiy tahlil qilish (bu bosqich tugamoqda);
- umumta’limiy dasturlangan pedagogik mahsulotlarni qo‘llash va axborot texnologiyalarining yaratilishiga oid tajribalar umumlashtirilishi, dasturlarni qo‘llashni metodik asoslash, o‘qituvchilarning kompyuter savodxonligini ta’minlash (bu bosqich boshlandi);
- maktab kursini yangi o‘qitish texnologiyalariga o‘tkazish, axborot texnologiyalarini ba’zi mavzularini o‘rganishda keng qo‘llash, darsga tayyorgarlik ko‘rishlari va o‘quv jarayonini boshqarish uchun o‘qituvchilarning kompyuter bilan ishlash vaqtini uzaytirish, alternativ ta’lim metodi sifatida yangi axborot texnologiyalarini qo‘llashga o‘tish, an’anaviy ta’lim metodikasi sharoitida ba’zi mavzularni dasturlashtirilgan pedagogik mahsulotlardan faol foydalanishga o‘tish (bu bosqich boshlanmoqda);
- yangi axborot texnologiyalaridan foydalanishning pedagogik tajribasi ijobiy natijaga olib kelgan fanlar mazmun va metodlarini qayta qarab chiqish hamda ta’limni to‘la yangi axborot texnologiyalari asosida tashkillashtirish (bu bosqich uyg‘unlashtirish davri deyiladi).

Zamonaviy ta’lim jarayonida raqamli resurslardan foydalanish, ta'lim samaradorligini oshirishning asosiy omillaridan biridir. Raqamli texnologiyalar, pedagogik yondashuvlar bilan birgalikda, o‘quv jarayonini tubdan o‘zgartirib, uni samarali, interaktiv va jozibador qilish imkonini beradi. Ushbu maqolada zamonaviy pedagogik va kompyuter texnologiyalarini ta’lim jarayoniga integratsiya qilishning ahamiyati, ularning o‘quvchilarning bilim va ko‘nikmalarini rivojlantirishdagi roli, shuningdek, bilim olish jarayonini shaxsiylashtirish imkoniyatlari muhokama qilinadi.Zamonaviy pedagogik texnologiyalar, o‘quv jarayonini yanada qiziqarli va interaktiv holga keltirishga qaratilgan. Bu texnologiyalar o‘quvchilarga o‘z bilimlarini mustaqil ravishda olish imkonini beradigan interaktiv vositalarni o‘z ichiga oladi. Misol uchun, onlayn platformalar, multimedia materiallar, virtual laboratoriyalar va simulyatorlar, o‘quvchilarning faol ishtirokini ta'minlaydi. Bunday yondashuvlar, o‘quvchilarning mustaqil fikrlash va ijodiy qobiliyatlarini rivojlantiradi [3].

Ushbu pedagogik texnologiyalar orqali ta’lim jarayonida o‘quvchilarning o‘zlashtirish darajasi va qiziqishlarini oshirish mumkin. Ta’lim jarayonida o‘quvchilarga turli xil raqamli resurslardan foydalanish imkoniyati berilganda, ular o‘z bilimlarini chuqurlashtirish va yangi ko‘nikmalarni egallashda ko‘proq motivatsiyaga ega bo‘lishadi.

Axborot texnologiyalarining ta’lim jarayoniga integratsiyasi, o‘quvchilarga yanada kengroq imkoniyatlar yaratadi. Raqamli resurslar yordamida, o‘quvchilar darslarni o‘z vaqtida va o‘z shaxsiy tempida o‘zlashtirishlari mumkin. Onlayn darslar va video materiallar, o‘quvchilarga ma’lumotlarga tezda kirish imkonini beradi va ularning bilim olish jarayonini shaxsiylashtiradi. Bu yondashuv, o‘quvchilarning individual ehtiyojlarini hisobga olish orqali, ta’lim samaradorligini oshirishga yordam beradi.

Shuningdek, axborot texnologiyalari o‘qituvchilar uchun ham yangi imkoniyatlar yaratadi. O‘qituvchilar o‘z darslarini yanada qiziqarli va jozibador qilish uchun raqamli vositalardan foydalanishlari mumkin. Bunday integratsiya, o‘qituvchilarni yangi pedagogik yondashuvlar bilan tanishtirib, ularning malakasini oshirishga yordam beradi.

Raqamli resurslardan foydalanish, o‘quv jarayonini shaxsiylashtirish imkoniyatlarini kengaytiradi. Har bir o‘quvchi o‘z bilim va ko‘nikmalarini o‘ziga xos tarzda rivojlantiradi. Ta’lim jarayonida individual yondashuv, o‘quvchilarning o‘zlariga mos materiallar va metodlardan foydalanish imkonini beradi. Bu esa, o‘quvchilarni yanada faol va mustaqil o‘rganishga rag‘batlantiradi.O‘quvchilar o‘z qiziqishlariga va ehtiyojlariga asoslangan materiallar bilan ishlaganda, ularning motivatsiyasi oshadi. Bunday sharoitda, o‘quvchilar o‘z bilimlarini yanada chuqurroq o‘zlashtirishi mumkin, bu esa ularning umumiy ta’lim sifatini oshirishga xizmat qiladi.

Zamonaviy pedagogik va axborot texnologiyalarini samarali tatbiq etish, o‘quvchilarning mustaqil fikrlash va ijodiy qobiliyatlarini rivojlantirishga imkon beradi. Raqamli resurslar yordamida, o‘quvchilar muammolarni hal qilish va kreativ yechimlar izlash jarayonida faol ishtirok etadilar. Ushbu jarayon, o‘quvchilarning analitik fikrlash qobiliyatini oshirishga yordam beradi.Shuningdek, ijodiy muammolarni hal qilishda o‘quvchilar o‘zlarining fikrlarini erkin ifoda etish imkoniyatiga ega bo‘lishadi. Bu esa, ularning o‘zini o‘zi ifoda etish qobiliyatini rivojlantirishga yordam beradi. Bunday yondashuvlar, kelajakdagi kasbiy faoliyatlarida ham yuqori samaradorlikka olib keladi, chunki zamonaviy mehnat bozorida ijodiy fikrlash va innovatsion yondashuvlar talab etiladi. [4, 5, 6].

Xulosa qilib aytganda, raqamli resurslardan foydalanish ta’lim oluvchilarni kasbga yo‘naltirish jarayonida nafaqat texnologiyalardan foydalanish ko‘nikmalarini shakllantiradi, balki ularning ta’lim samaradorligini oshirishda ham muhim rol o‘ynaydi. Raqamli resurslar, yoshlarning axborot va kommunikatsiya texnologiyalari bilan ishlash qobiliyatini rivojlantirish orqali, ularga zamonaviy mehnat bozorida muvaffaqiyatli faoliyat yuritish imkoniyatlarini yaratadi.Raqamli resurslardan foydalanish madaniyatini shakllantirish, kelajak avlodning kasbiy va shaxsiy rivojlanishida katta ahamiyat kasb etadi, chunki u yoshlarni raqamli

muhitdagi imkoniyatlardan unumli foydalanishga o‘rgatadi. Raqamli resurslardan foydalanish, shuningdek, yoshlarning ijodiy qobiliyatlarini oshiradi va ularni axborotni tahlil qilish, baholash va sintez qilish kabi muhim masalalarda ongli qarorlar qabul qilishga tayyorlaydi.Shu sababli, ta’lim tizimida raqamli resurslardan foydalanishni rivojlantirishga qaratilgan chora-tadbirlar, nafaqat individual shaxslar uchun, balki butun jamiyat uchun ijtimoiy va iqtisodiy taraqqiyotga xizmat qiladi. O‘zbekistonning raqamli ta’limni rivojlantirish bo‘yicha strategiyalari, yoshlarni global raqobatga tayyorlashda muhim omil bo‘lib qoladi.

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TALABALARDA EKOLOGIK MADANIYATNI SHAKLLANTIRISH VA EKOLOGIK XAVFSIZLIKNI OSHIRISH

Annotatsiya: *Ekologik madaniyat bu tadqiqotchilar fikriga ko'ra yoshlarning amaliy faoliyatda tabiat bilan bog'liqlik va xulq-atvori orqali namoyon bo'ladigan yoshlariy madaniy va ijtimoiy qadriyatlarni yaratishdir. Ekologik madaniyat orqali sog'lom turmush muhitini yaratish, rivojlanish va odamlar taraqqiyot ehtiyojlarini qondirish uchun qiziqishlariga va tabiiy o'zgartirish, xulq munosabati ifodalangan madaniy va ijtimoiy qadriyatlarni hisobga olish zarur. Ekologik madaniy qadriyatlar - bu tabiat ekotizimida yashash, ishlash va rivojlanish jarayonida odamlar tomonidan yaratilgan barcha qadriyatlardir. Ushbu maqolada, yoshlarda ekologik madaniyatni shakllantirish va ekologik xavfsizlikni oshirish haqida fikr va mulohazalar yuritiladi.*

Kalit so'zlar: *Ekologiya, madaniyat, ekologik xavfsizlik, ijtimoiy qadriyatlar, sog'lom muhit yaratish, yoshlar tarbiyasi, tabiatni asrash.*

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FORMING AN ECOLOGICAL CULTURE IN STUDENTS AND INCREASING ECOLOGICAL SAFETY

Abstract: *According to researchers, ecological culture is the creation of youth cultural and social values, which are manifested in the practical activities of young people through their connection with nature and behavior. In order to create a healthy living environment through ecological culture, to meet the needs of development and progress of people, it is necessary to take into account cultural and social values, expressed in their interests and natural changes, behavioral attitudes. Ecological cultural values are all values created by people in the process of living, working and developing in the natural ecosystem. This article discusses ideas and considerations on the formation of ecological culture in young people and increasing ecological safety.*

Keywords: *Ecology, culture, ecological safety, social values, creating a healthy environment, youth education, nature conservation.*

“Ekologik madaniyat - bu madaniy qadriyatlar tizimi Bu imperativ: "bu bugungi kunda yashayotganlar manfaatlari uchun qabul qilinishi mumkin emas odamlar kelajak avlodlar manfaatlariga zarar yetkazish uchun”, - deydi E.S. Demidenko. Bu ta'rif ongli ravishda rad etishni ko'rsatadi antropotsentrizm, inson o'z hayotini qoidalarga muvofiq qurishni boshlaganida biotsentrizm yoki ekosentrizm, inson markaz bo'lmaganda Koinot va uning manfaatlari birinchi o'rinda emas. Qoidalarga ko'ra biotsentrizm, biosferani saqlash butun insoniyat uchun hamma narsadan ustundir sayyorada. Barcha tirik organizmlar biosferaning fuqarolari hisoblanadi, ularning har biri Yerning qiymatidir. Axir, bu faoliyat inson - texnologiyaning rivojlanishi, tabiiydan ortiqcha foydalanish resurslar, o'simlik va hayvonot dunyosining nobud bo'lishi, atmosferaning, gidrosferaning ifloslanishi va litosfera - insoniyatni global ekologik inqiroz oldiga qo'ydi inqiroz. Bu odamlarni kelajak haqida o'ylashga va qayta ko'rib chiqishga majbur qildi ustuvorliklar Pedagogika fanlari nomzodi N.R. Astraxanova, “Ekologik madaniyat shaxs ma’naviy olamining ajralmas elementidir. U ekologik yo'naltirilgan ongni ifodalaydi va insonparvarlik qadriyatlariga asoslangan xulq-atvor yo‘nalishlari va tabiatga munosabati”. erishish uchun yuqori darajadagi ekologik madaniyatni shakllantirish zarur o'quvchining tirik tabiat olamiga hissiy va qadriyatga asoslangan munosabati. Natijaga erishish uchun siz shartlar va yo'lni aniqlashingiz kerak, kollej talabalarining tajribalarini rivojlantirishga yordam beradi hissiy-qiymat munosabatlari. Bu tizim bir-biriga bog'langan va o'zaro bog'liq bloklardan qurilgan ma'lum bir ketma-ketlikda joylashgan: umumiy ekologik inson madaniyati – insonning ekologik ongi – shaxsiy ekologik madaniyat.

madaniyat uzluksiz pedagogik jarayondir. Bu jarayon talabalarning kasbiy tayyorgarligi bilan bir vaqtda amalga oshiriladi va o'quvchilarda ekologik madaniyatni shakllantirish bo'yicha ishlarning samaradorligi kollej pedagogik shart-sharoitlar yordamida amalga oshiriladi. Bundaylarga pedagogik shartlarga quyidagilar kiradi: talabalarni kelajak sifatida shakllantirish tabiatga mas'uliyatli munosabatda bo'lgan mutaxassislar; sinflarda qo'llash talabalarni bajarishga undaydigan bunday vazifalar kasbiy sohada atrof-muhitni muhofaza qilish faoliyati; foydalanish o‘quvchilarning ongini o‘zgartiruvchi turli interfaol usullar tabiatga nisbatan, shuningdek, unga qanday munosabatda bo'lishimiz haqidagi stereotiplarni o'zgartirish;maqsadli integratsiyalashgan kursni o'quv jarayoniga kiritish kasbiy faoliyatda ekologik muammolarni ko'rib chiqish talaba.

Shunday qilib, fakultativ kurs ishlab chiqildi va amalga oshirildi, bu shakllanish jarayonida propedevtik vazifani bajargan kollej talabalarining ekologik madaniyati. Kursni o'rganish jarayonida talabalar ekologiya bo'yicha individual ish olib bordi. Hamma ishlar tahlil qilindi va baholandi. Bu rag'batlantirish uchun kerak talabalarni atrof-muhitni muhofaza qilish faoliyatiga. Buni o'rganish davomida ning mavjud bilimlarini baholash uchun kurs doimiy va davriy ravishda olib borildi talabalar, kursni tugatgandan so'ng yakuniy baholash o'tkazildi.Olingan natijalar

doimiy ravishda tahlil qilindi, umumlashtirildi va solishtirildi. Bu qanday o'zgarishlar yuz berayotganini tushunishga imkon berdi talabalarning ekologik madaniyati. Shunday qilib, shakllantirish yoki oshirish kollej o‘quvchilarining ekologik madaniyati darajasi zarur to'liq kurs. Muhim shart - talabalar bajarishi doimiy ravishda tekshiriladigan va baholanadigan vazifalar. O.V.Shishkina o'z ishida zarur shart-sharoitlarni tasvirlaydi talabalarda ekologik madaniyatni shakllantirish. Bunday sharoitlarga quyidagilarni o'z ichiga oladi: atrof-muhitni muhofaza qilishning maqsadli tadbirlaridan foydalanish talabalarga, tizimli va har tomonlama ta'sir qilishdan foydalanish atrof-muhitni muhofaza qilish faoliyati. Uy vazifasi sifatida, talabalar ekologik mavzuda insho yozish. Samaradorlik tasdiqlandi tomonidan ishlab chiqilgan L.S. targ'ib qiluvchi Astafiev usuli talabalarning ekologik madaniyati darajasini shakllantirish va takomillashtirish texnik kollejlar. Olingan natijalar shundan dalolat beradi talabalarning ekologik madaniyatini shakllantirishning tanlangan metodikasi kasb-hunar kollejlari jarayonida samarali talabalarni tayyorlash. Ushbu resurslar bepul mavjud istagan har bir kishi, shuning uchun har qanday o'qituvchi ulardan foydalanishi mumkin talaba darslarga tayyorlanish uchun. Tadqiqotning muhim tarkibiy qismi L.S. Astafieva - ekologiyani shakllantirish usullarini joriy etish o'rta kasb-hunar ta'limining o'quv jarayonida o'quvchilar madaniyati. Eksperimental ma'lumotlar o'quv va uslubiy qo'llanmalarni ishlab chiqishda ishtirok etishi mumkin; shuningdek, qo'shimcha ta'lim tizimida.

Ekologik madaniyat bu inson, tabiat va jamiyat munosabatlarini idrok etish natijasidir, u ham fikrlash usuli, tabiiy ekologik muhit va yoshlarni tabiatni asrash ruhida tarbiyalashdir. Ekologik madaniyat yoshlarning tabiatga bo'lgan mehrini ham ifodalaydi. Muayyan fikrlash tarzi, turmush tarzi va ishlab chiqarish uslubi hisoblanadi. Jamiyat tabiiy ekologik muhitga katta ta'sir ko'rsatadi. Agar har bir jamoaning qarashlari, individual hurmat va tabiiy muhit bilan uyg'unlikda yashasa, obyektivlik qonunlariga rioya qilish zarur. Bu turmush tarzi, ekologik madaniy turmush tarziga aylanadi, barqaror rivojlanish uchun muhim turtki bo'ladi. Ekologik madaniyat yoshlar faoliyatidagi harakatlar orqali namoyon bo'ladi, bu insoniyatning barqaror rivojlanish sari tabiiy zabt etishining namoyon bo'lishi hisoblanadi. Shuning uchun ekologik madaniyatning asosiy mazmuni munosabatlarni, yoshlarning tabiiy muhit bilan o'zaro aloqasini o'rganish, odamlarga atrof-muhit haqidagi bilimlarni, atrof-muhitning yoshlar rivojlanishidagi rolini o'rganishdir. Bu odamlarning barqaror rivojlanishi uchun amaliy faoliyatda ekologik muvozanatni ta'minlab, odamlarning ekologik muhitni himoya qilish uchun harakatini shakllantiradi. Yoshlarning ekologik madaniyat to'g'risida chuqur xabardorligini namoyish etadigan amaliy faoliyat tabiat, yoshlar va jamiyat tizimining mavjudligi va barqaror rivojlanishining hal qiluvchi omiliga aylanib, ekologik madaniyat yoshlariyatning barqaror rivojlanishi uchun zarur bo'lgan rivojlanishdir. Ekologik madaniyatni insoniyatning barqaror rivojlanishining muhim kalitiga aylantirish uchun ekologik madaniy ta'lim faoliyati kuchaytirilishi kerak, ekologik madaniyathaqidagi bilimlarni oshirib borish orqali yoshlar, tabiat va jamiyat o'rtasidagi munosabatlar to'g'risida xabardorlik kuchayadi. Ekologik madaniy ta'lim

- bu har bir shaxs va jamiyat uchun xabardorlikni oshirish, tabiat – yoshlar va jamiyat o'rtasidagi munosabatlar haqidagi bilimlarni mustahkamlash, o'sib borayotgan iqtisodiyot va jamiyat uchun amaliy faoliyatda yoshlarning ekologik muhitga nisbatan xattiharakatlarini tartibga solish sifati va qobiliyatini shakllantiradi. Birinchidan, ekologik madaniyatni oshirishda yoshlar - tabiiy - ijtimoiy o'rtasidagi dialektik munosabatlar haqidagi bilimlar bilan ta'minlaydi, dunyoning birligini ko'radi, shuningdek odamlar ekologik muhitga nisbatan o'z majburiyatlarini anglashlari kerak. Amaliy faoliyatdagi har qanday yoshlar harakati tabiat bilan bog'liq, shuning uchun yoshlar harakat qilishi kerak, lekin yoshlar – tabiiy – jamiyatlar o'rtasidagi munosabatlarning birligini ta'minlaydi. Shunday qilib, ekologik madaniy ta'limni takomillashtirish har bir shaxs va jamoaga tabiiy muhitning mohiyatini, biologik, fizik, kimyoviy, ijtimoiy, iqtisodiy va madaniy jihatlarning o'zaro ta'sirini tushunishga, bashorat qilishda samarali va mas'uliyat bilan ishtirok etish uchun bilim, munosabat va amaliy ko'nikmalarga ega bo'lishga yordam beradi. ekologik muammolarni hal qilish va ularni boshqarib boradi. Ekologik madaniyat ta'limi sayyoramizdagi har bir shaxsning, har bir ijtimoiy hamjamiyatning mas'uliyati, burchi va vijdoniga aylanib bormoqda. Ikkinchidan, ekologik madaniy ta'lim faoliyati orqali, biz ekologik atrof-muhit uchun yoshlar hurmatni rivojlantirishimiz mumkin; ekologik madaniyat xabardorligini oshirish, barqaror rivojlanish bilan ekologik madaniyat roli tabiat qonunlarini hurmat yo'nalishi bo'yicha ixtiyoriy ravishda (oqilona) nazorat yoshlar va tabiat o'rtasidagi munosabatlar uchun asos bo'ladi. Amaliy faoliyat jarayonida, birinchi navbatda, ishlab chiqarish mehnati, odamlar tabiatga keskin ta'sir ko'rsatdi. Ilm-fan va texnologiya yordamida asboblar tobora takomillashib bormoqda. Xususan, ekologik madaniy ta'lim nafaqat yoshlar va ekologik muhit o'rtasida mos, muvozanatli munosabatlarni yaratishga qaratilgan, balki u ham o'ziga xos ijobiy ma'noga ega bo'lib, barqaror rivojlanish asosi sifatida ekologik va gumanistik birlikka ega zamonaviy, sanoat jamiyatini rivojlantirish uchun mos bo'lgan shaxsni shakllantirishdir. Boshqa barcha ta'lim shakllari singari, ekologik madaniy ta'lim ham ekologiya - gumanitar fanlar sohasida ilmiy, axloqiy, estetik va madaniy ong haqida ta'lim jarayonidir. Agar ilgari yoshlar tabiatni go'zalligi va o'ziga xos qadriyatlari uchun qadrlagan bo'lsa, bugungi kunda yoshlarning xudbin manfaatlari tufayli yoshlar faqat tabiatdan foydalanish qadriyatlari va amaliyligi bilan qiziqadi. Hozirgi odam kelajak avlodlar tomonidan "qarzga olingan" barcha narsalar bilan yashaydi, desak mubolag'a bo'lmaydi. Odamlar va tabiat o'rtasidagi munosabatlardagi xulq-atvorni o'zgartirish uchun ekologik madaniy ta'lim orqali ekologik madaniyat to'g'risida xabardorlikni oshirish, yoshlarning yashash muhitiga mehrini ko'rsatadigan ekologik madaniyat qadriyatlarini shakllantirish, shakllantirish zarur: turmush tarzi, urf-odatlari, an'analari yoshlar va tabiat o'rtasidagi munosabatlardagi "haqiqiy", "axloqiy", qadriyatlarni hisobga olgan holda ekologik madaniyat bilan bog'liq. Uchinchidan, ekologik madaniyat haqida xabardorlik tabiatga hurmat bilan munosabatda bo'lish, maqsadga bo'ysunish, yoshlarning amaliy faoliyatida harakat qonunlarini tabiiy muhit bilan muvozanatlash uchun asosdir. Chunki atrof - muhitni muhofaza qilish bo'yicha

harakat qilishga tayyorlik tabiat - yoshlar va jamiyat o'rtasidagi dialektik munosabatlar haqidagi bilim, tushuncha asosida shakllanadi va ekologik muhitga hurmat bilan munosabatda bo'lish orqali namoyon bo'ladi, amaliy faoliyatda: ekologik qonunlarni amaliy faoliyatda qo'llash, atrof-muhitni muhofaza qilish to'g'risidagi qonunni amalga oshirish; ekologik qonunlarni amalga oshirish. hayot tarzi, atrof-muhit bilan do'stona munosabatda bo'lish, tashkilotlar va yashash joylarini atrof-muhitni muhofaza qilish harakatlari va faoliyatida ishtirok etish; ishlab chiqarish, biznes va xizmat ko'rsatish faoliyatini, shuningdek atrof-muhitni muhofaza qilish inspektsiyasi faoliyatini, ixtisoslashgan mansabdor shaxslar va vakolatli tashkilotlar tomonidan nazorat qilishni nazorat qilish; atrof-muhitni muhofaza qilish to'g'risidagi qonun hujjatlari va qonun hujjatlarini bajarish uchun g'oyalarni qo'shishdir. To'rtinchidan, ekologik madaniyat to'g'risida xabardorlikni oshirish uchun ta'limni kuchaytirish ijtimoiy ishlab chiqarishning ekologik jarayoni uchun asosdir. Barqaror rivojlanish strategiyasining eng asosiy maqsadi bo'lgan eng muhim tamoyillardan biri bu tabiiy ekologik muhitni saqlash va muhofaza qilishdir. Bu shuni anglatadiki, odamlar ijtimoiy ishlab chiqarishning ekologik jarayonini amalga oshirishi kerak. Chunki, ijtimoiy ishlab chiqarish har qanday darajada yoki bosqichda har doim yoshlar va jamiyatning ajralmas vositasi sifatida ishlaydi, ammo hozirgi holatda ekologik muhitga zarar etkazishga yo'l qo'yilmaydi. Ekologik madaniyat, ekologik madaniyatning jamiyat taraqqiyotidagi o'rni to'g'risida xabardorlikni oshirish ijtimoiy ekologik jarayonning zaruriy sharti, asosi sifatida qaralishi mumkin.ishlab chiqarish. Boshqa tomondan, ekologik madaniy ta'limni qamrab olish yoshlarning ijtimoiy hayotdagi barcha boshqa faoliyatining ekologik jarayoni uchun asosdir. yoshlar va jamiyatning mavjudligi va rivojlanishini ta'minlash uchun ekologik jarayonning maqsadini bajarishdan tashqari, siyosat, axloq, huquq, ma'naviy madaniyat sohalarida boshqa barcha yoshlar faoliyati uchun ekologik jarayonni amalga oshirish kerak.

XULOSA. Shunday qilib, ekologik madaniyat yoshlar va tabiat o'rtasidagi munosabatlarda haqiqat - xayrixohlik – tabiatni avaylash qadriyatlarini namoyish etadi. Hozirgi davrda fan va texnikaning rivojlanishi yoshlar farovonligida sezilarli yaxshilanishlarni amalga oshirdi va yashash joylari ko'p yo'nalishlarda kengaytirildi, ammo ekologik muhit yomon ta'sir ko'rsatmoqda. Shubhasiz, bugungi kunda yoshlariyat tabiiy dunyoning bizga bo'lgan munosabatiga olib kelishi kerak bo'lgan oqibatlar bilim, tsivilizatsiya emas, balki axloqiy masaladir. Ekologik madaniyatning mavjudligi va yoshlar va tabiat munosabatlar uzoq muddatli rivojlanish tamoyili tabiiy dunyo tomon yoshlar madaniyati yetishmasligidir. Rivojlanish strategiyasida ekologik madaniyat ta'limi faoliyatini takomillashtirish va ekologik madaniyatni shakllantirish barqaror rivojlanish uchun ijtimoiy ishlab chiqarish va ekologik muhit o'rtasidagi munosabatlarni ongli ravishda boshqarish uchun asosdir.

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BIOLOGIK KURASH VOSITALARINING ISHLAB CHIQARISH TEXNOLOGIYASI VA QO‘LLASH USULLARI

Annotatsiya. *Ushbu maqolada qishloq xo‘jalik ekinlariga zarar yetkazuvchi hasharotlarga qarshi biologik kurashning zamonaviy yondashuvlari, xususan foydali entomofaunaning asosida ishlab chiqilgan biologik kurash vositalarining ishlab chiqarish texnologiyasi va ularni amaliyotda qo‘llash usullari yoritilgan. Biologik agentlar sifatida yirtqich va parazit hasharotlar, entomopatogen zamburug‘lar hamda foydali kenelarning roliga alohida e’tibor qaratilgan. Shuningdek, laboratoriya va issiqxona sharoitida biologik vositalarni ko‘paytirish texnologiyasi, ularning saqlash, qadoqlash va dala sharoitida qo‘llash texnikasi haqida ma’lumotlar keltirilgan. Mazkur maqola biologik himoya tizimini rivojlantirish, zararkunandalarga qarshi kimyoviy vositalar iste’molini kamaytirish va ekologik xavfsizlikni ta’minlashga xizmat qiladi.*

Kalit so’zlar . *Biologik kurash vositalari, Entomofauna, Foydali hasharotlar, Yirtqich kenelar, Parazitlar, Entomopatogen mikroorganizmlar, Laboratoriya texnologiyasi, Issiqxona sharoitida ko‘paytirish, Ekologik xavfsizlik, Integratsiyalashgan zararkunanda nazorati.*

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PRODUCTION TECHNOLOGY AND APPLICATION METHODS OF BIOLOGICAL CONTROL AGENTS

Abstract. *This article illuminates modern approaches to biological control against agricultural pests, specifically focusing on the production technology of biological control agents developed based on beneficial entomofauna and their practical application methods. Special attention is paid to the role of predatory and parasitic insects, entomopathogenic fungi, and beneficial mites as biological agents. Furthermore, information is provided on the technology for multiplying biological agents under laboratory and greenhouse conditions, as well as their storage, packaging, and application techniques in field conditions. This article serves to develop biological protection systems, reduce the consumption of chemical agents against pests, and ensure ecological safety.*

Keywords. *Biological control agents, Entomofauna, Beneficial insects, Predatory mites, Parasites, Entomopathogenic microorganisms, Laboratory technology, Greenhouse propagation, Ecological safety, Integrated pest management.*

Entomofaglarni ko‘paytirish texnologiyasi.

Entomofaglar maxsus biolaboratoriyalarda sun’iy yoki tabiiy ozuqa manbalarida ko‘paytiriladi. Masalan:

Trichogramma spp. ni ishlab chiqarish texnologiyasi.

1. Zaxira (dona) koloniyani saqlash

Asosiy ona koloniyalar biologik inkubatorlarda 25–28°C, 70–80% nisbiy namlik va 16:8 yorug‘lik-soya rejimida saqlanadi.

Ular har doim yangi tuxum bilan oziqlantirilib turiladi.

2. Xost (egasi) tuxumini tayyorlash

Trichogramma lichinkasi rivojlanishi uchun tuxum kerak bo‘ladi. **Buning uchun ko‘pincha quyidagilardan foydalaniladi:**

Don kuyasi (Sitotroga cerealella) (1-rasm) yoki Un parvonasi (Ephestia kuehniella) (2-rasm) tuxumlari asosiy "xost" sifatida ishlatiladi.

1-rasm. Don kuyasi (Sitotroga cerealella).

2-rasm. Un parvonasi (Ephestia kuehniella).

Don kuyasi (Sitotroga cerealella) — xavfli ombor zarrarkunandasi. Qurti makkajo‘xori so‘talari, arpa, sholi, bug‘doy, javdar, shuningdek, suli, oq jo‘xori va dukkakli ekinlar donini shikastlaydi. Kapalagi 6—9 mm, kanoti yozilganda 11 — 19 mm. Oldingi qanotlari uchli, uchida ingichka tillarang popugi bor, kanoti asosidan qora chiziq o‘tgan.

Tuxum tayyorlash: Tuxumlar yig‘ilib, 30 daqiqa davomida UV nur bilan nurlantiriladi yoki 2–5°C da 24 soat sovitiladi — bu ularning rivojlanishini to‘xtatadi, lekin Trichogramma uchun foydali holatda saqlanadi.

3. Infeksiyalash (inkulyatsiya)

Tuxumlar yupqa qatlam holida karton, pergament yoki shisha plastinkaga yopishtiriladi.

Har bir kartonga taxminan 100–200 tuxumdan.

Trichogramma urg‘ochilari ushbu tuxumlarga qo‘yib yuboriladi.

Inkubatorga qo‘yiladi: 25–28 °C, 70% namlik.

4. Parazitlash va rivojlanish

Trichogramma tuxum ichida 8–10 kun ichida rivojlanadi.

Tuxum rangi qorayib boradi — bu parazitlash muvaffaqiyatli bo‘lganidan dalolat.

10 kundan so‘ng voyaga yetgan Trichogramma tuxumdan chiqadi.

5. Qadoqlash va saqlash

Chiqib kelgan Trichogramma yoki hali tuxum ichidagi parazitlar biopaketlar, kapsulalar yoki kartonlar ko‘rinishida qadoqlanadi.

2–4 °C da 2 haftagacha saqlanishi mumkin (faol holatini yo‘qotmasdan).

6. Tashqi sharoitga qo‘llash (biologik kurashda)

Trichogramma ko‘plab zararkunandalarning tuxumiga qarshi ishlatiladi: masalan, piltakurtlar (Helicoverpa, Spodoptera), kalamush parvonasi (Ostrinia nubilalis) va boshqalar.

Har gektar maydonga 100 000–300 000 Trichogramma qo‘llanilishi mumkin.

Tashqariga chiqarish davri: zararkunanda tuxum qo‘yadigan davrga to‘g‘rilanadi.

Bracon hebetor ni ishlab chiqarish texnologiyasi.

Umumiy ma’lumot:

Bracon hebetor — parazitoid arilar oilasiga mansub foydali hasharot bo‘lib, lepidopteralar (kapalaklar) oilasiga mansub ko‘plab zararkunandalar (masalan, g‘o‘za qurtlari, un zararkunandalari) ning g‘umbaklariga parazitlik qiladi (3-rasm).

3-rasm. Bracon hebetor.

Asosan quyidagi zararkunandalarga qarshi ishlatiladi (4-rasm): Un parvonasi **(**Ephestia kuehniella), Mum kuyasi (Galleria mellonella), Don kuyasi (Plodia interpunctella), G'o'za tunlami (Helicoverpa armigera), Spodoptera spp. va boshqalar

Un parvonasi (Ephestia kuehniella)	Mum kuyasi (Galleria mellonella)	Don kuyasi (Plodia interpunctella)	G'o'za tunlami (Helicoverpa armigera)

4-rasm. Zararkunandalar.

Ishlab chiqarish bosqichlari:

1. Xost (egasi) zararkunandani ko‘paytirish

Bracon hebetor ko‘payishi uchun uni oziqlantiruvchi zararkunanda (masalan, Ephestia kuehniella yoki Galleria mellonella) g‘umbaklari kerak bo‘ladi.

Bosqichlari:

Xost sifatida Ephestia kuehniella parvonalari laboratoriyada o‘stiriladi.

Don, kepak, un va asal aralashmasida parvonalar ko‘paytiriladi.

G‘umbaklar yig‘ib olinadi (yoshi: 4–5 instar — eng faol va Bracon uchun mos davr).

2. Bracon hebetor urg‘ochilarini tayyorlash

Urg‘ochi Braconlar avvalgi seriyadan olinadi yoki xomaki populyatsiya saqlanadi.

Har bir plastik yoki shisha idishga 20–30 ta Ephestia g‘umbagi va 5–10 ta urg‘ochi Bracon qo‘yiladi.

Ular yopiq idishlarda (qopqog‘ida ventilyatsiya uchun gazlama bo‘lishi kerak) saqlanadi.

3. Parazitlash sharoitlari: Temperatura: 26–30°C, **Namlik:** 60–70%, **Yorug‘lik:** 12:12 yoki 14:10 (yorug‘lik/soya).

Urg‘ochi Braconlar g‘umbakni falaj qilib, ustiga tuxum qo‘yadi. 3–5 kun ichida lichinka paydo bo‘ladi, g‘umbak ichida rivojlanadi.

4. Voyaga yetish va yig‘ish

Parazitlangan g‘umbaklar 7–10 kun ichida ichidan yangi Braconlar chiqadi.

Ular kichik plastik idishlarda, gazli qopqoqli naychalarda saqlanadi.

Voyaga yetgan Braconlar asal eritmasi bilan oziqlantiriladi (1:10 nisbati bilan suvga eritilgan asal).

5.1. Qadoqlash va tashqi muhitga chiqarish

Har bir gektar maydonga 1000–2000 ta Bracon qo‘yish mumkin.

Ular parazitlangan g‘umbaklar bilan maydonlarda qoldiriladi yoki maxsus qadoqlarda (biokapsula) o‘rnatiladi.

Zararkunanda bosqichlariga qarab 2–3 marta chiqarish takrorlanadi.

Saqlash:

4–10°C da voyaga yetgan Braconlar 7–10 kun saqlanishi mumkin.

Parazitlangan g‘umbaklar holida 2 haftagacha saqlansa ham bo‘ladi (faoliyatini yo‘qotmasdan).

Afzalliklari: Kimyoviy pestitsidlarga nisbatan ekologik xavfsiz, Oson ko‘payadi, Turli zararkunandalarga qarshi universalligi yuqori.

5.2. Mikrobiologik vositalarni ishlab chiqarish.

Bacillus thuringiensis (Bt) ishlab chiqarish texnologiyasi:

Mikroorganizmlar selektsiyasi: ma’lum shtammlar (Bt var. kurstaki) tanlanadi

Fermentatsiya: suyuqlik muhitda, 32–36 soat davomida aeratsiya bilan

Suspenziya tayyorlash: fermentatsiya mahsuloti suspenziya holatiga keltiriladi

Qadoqlash: 100–200 g lik paketlarda, kukun yoki granul holatda

Saqlash: 4–10°C haroratda, qorong‘u joyda [2]

O‘zbekiston bozorida ishlab chiqarilayotgan asosiy mikrobiologik preparatlar:

Lepidotsid – kapalak lichinkalariga qarshi

Gaupsin – bakterial va zamburug‘li kasalliklarga qarshi

Boverin – trips, shira, oqkanotlilarga qarshi [3]

5.3. Feromon vositalarini ishlab chiqarish

Feromon vositalar sintetik kimyo laboratoriyalarida yaratiladi. Ular quyidagilardan iborat:

Feromon kapsula: o‘ta past dozada faol modda

Dispensiyalar: plastik yoki rezinali konteynerlar, ta’sir davomiyligi 20–60 kun

Tuzoq qurilmalari: DELTA, UNI-trap kabi maxsus tuzoqlar

Feromonlar monitoring, mass trapping yoki mating disruption usullarida ishlatiladi [4].

5.4. Dalada qo‘llash texnologiyasi

Vosita turi	Qo‘llash usuli	Qo‘llash vaqti	Dozalash
Trixogramma spp.	Kapsula yoki kartoncha bilan sochiladi	Kapalaklar tuxum qo‘yganda	100–200 ming/ga
Bracon hebetor	Lichinkali konteynerlar qo‘yiladi	Lichinka bosqichi	5–10 ming/ga
Lepidotsid	O‘simlikka purkaladi (suspenziya holatida)	Ertalab/yomg‘irdan keyin	1–2 kg/ga
Feromon tuzoqlar	Dala bo‘ylab 1–2 m balandlikda osiladi	Vegitatsiya boshida	5–10 dona/ga

Qo‘llash vaqtida quyidagi shartlarga rioya qilish muhim:

Harorat 20–30°C dan yuqori bo‘lmasligi

Kunduzi soya joylarda qo‘llash samaraliroq

Yomg‘ir yoki shamolli ob-havo bo‘lmasa yaxshi [5]

5.5. Saqlash, transport va sifat nazorati

Biologik vositalar tirik organizmlar asosida tayyorlangani sababli quyidagilar muhim:

Saqlash muddati: 1 oydan 6 oygacha (turi va shakliga qarab)

Harorat: +4°C dan +10°C gacha

Namlik: 60–70% gacha

Transport: maxsus konteynerlarda, muzlatkichli transport vositalarida

Sertifikatlash: har bir partiya sifat nazoratidan o‘tkazilishi lozim [6]

Xulosa

Zamonaviy qishloq xo‘jaligida biologik kurash vositalarining roli ortib bormoqda. Ularning asosiy afzalliklari – ekologik xavfsizligi, selektivligi, zararkunandaga qarshi uzoq muddatli ta’siri va pestitsidlarga nisbatan qarshilik rivojlanishini oldini olishidir. Biologik vositalarning muvaffaqiyatli qo‘llanilishi ularni to‘g‘ri ishlab chiqarish, saqlash va qo‘llash texnologiyalariga amal qilinishiga bog‘liq. Foydali entomofauna, ayniqsa Amblyseius swirskii, Trichogramma spp., Beauveria bassiana kabi biologik agentlar selektiv va kompleks yondashuvda yuqori samaradorlik ko‘rsatmoqda. Mahalliy sharoitda bu vositalarni ishlab chiqarishni yo‘lga qo‘yish iqtisodiy va ekologik jihatdan foydalidir.

Tavsiyalar

1. Biologik kurash vositalarining laboratoriya va issiqxona sharoitida ko‘paytirish texnologiyasini yanada takomillashtirish lozim, ayniqsa mahalliy agroiqlim sharoitlariga mos turlarni tanlash muhimdir.

2. Fermer va agronomlar uchun amaliy o‘quv seminarlari tashkil etish orqali biologik vositalarni to‘g‘ri qo‘llash bo‘yicha bilim va ko‘nikmalarni oshirish kerak.

3. Davlat miqyosida biologik himoya vositalarini qo‘llashni rag‘batlantirish dasturlarini joriy etish, shu jumladan subsidiyalar va soliq imtiyozlari berilishi maqsadga muvofiqdir.

4. Kimyoviy vositalarga nisbatan alternativ sifatida integratsiyalashgan zararkunandalar nazorati tizimlarini joriy etish, bu esa pestitsidlar yukini kamaytiradi va agroekotizimlarni muhofaza qiladi.

5. Biologik vositalarni sertifikatlash, monitoring qilish va ularning sifatini nazorat qilish bo‘yicha alohida nazorat tizimini tashkil etish zarur.

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BIOLOGIK KURASH USULLARINING TURLARI

Annotatsiya. *Ushbu maqolada qishloq xo‘jaligi zararkunandalariga qarshi kurashda qo‘llaniladigan biologik usullar va ularning asosiy turlari keng yoritilgan. Jumladan, entomofaglar (yirtqich va parazit hasharotlar), entomopatogen mikroorganizmlar (zamburug‘lar, bakteriyalar, viruslar), biologik ekstraktlar va boshqa tabiiy kelib chiqishdagi vositalarning roli, afzalliklari hamda qo‘llanilish yo‘nalishlari bayon etilgan. Biologik kurash usullarining samaradorligi, ularni integratsiyalashgan himoya tizimlariga kiritish imkoniyatlari, ekologik xavfsizligi va iqtisodiy jihatdan foydaliligi haqida fikr yuritilgan. Maqola o‘simliklarni kimyoviy moddalarsiz muhofaza qilishga intilayotgan agronomlar va olimlar uchun amaliy ahamiyatga ega.*

Kalit so’zlar. *Biologik kurash, Entomofaglar, Entomopatogen mikroorganizmlar, Parazit hasharotlar, Yirtqich kenelar, Biologik ekstraktlar, Tabiiy dushmanlar, Zararkunanda nazorati, Ekologik xavfsizlik, Integratsiyalashgan himoya.*

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TYPES OF BIOLOGICAL CONTROL METHODS

Abstract. *This article broadly discusses biological methods used in pest control in agriculture and their main types. Specifically, it describes the role, advantages, and application areas of entomophages (predatory and parasitic insects), entomopathogenic microorganisms (fungi, bacteria, viruses), biological extracts, and other naturally derived agents. The article also covers the effectiveness of biological control methods, their potential for integration into plant protection systems, their ecological safety, and economic benefits. This article holds practical significance for agronomists and scientists aiming to protect plants without chemical substances.*

Keywords. *Biological control, Entomophages, Entomopathogenic microorganisms, Parasitic insects, Predatory mites, Biological extracts, Natural enemies, Pest control, Ecological safety, Integrated protection.*

1. Klassik (importatsion) biologik kurash.

Klassik kurash usuli chet davlatlardan keltirilgan tabiiy dushmanlarni (entomofaglar, parazitlar yoki patogenlar) yangi muhitga moslashtirib qo‘yishdan iborat. Bu usul, ayniqsa, avval u yerda uchramagan invaziv zararkunandalarga qarshi samarali hisoblanadi [1].

Misol: Rodolia cardinalis qo‘ng‘izi (6-rasm) Kaliforniyada Icerya purchasi (g’o’za shirasiga o‘xshash zararkunanda) ga qarshi muvaffaqiyatli qo‘llanilgan [2].

6-rasm. Rodolia cardinalis qo‘ng‘izi va lichinkasi.

2. Augmentativ biologik kurash

Bu usulda foydali organizmlar (ko‘pincha laboratoriyada) ko‘paytirilib, dala sharoitida ommaviy ravishda qo‘yib yuboriladi. Bu ikki xilga bo‘ladi:

Inokulyativ – sezilarli miqdorda, lekin uzoq muddatli ta’sir uchun qo‘yish.

Inundativ – katta miqdorda, tezkor va qisqa muddatli ta’sir uchun qo‘yish [3].

Masalan: Trixogramma spp. parazitari (7-rasm) tuxum bosqichida g’o’za kapalaklari va karam kapalagi kabi zararkunandalarga qarshi ishlatiladi [4].

7-rasm. Trixogramma spp. Parazitari.

3. Konservativ biologik kurash

Bu usulda mavjud foydali organizmlarga qulay sharoit yaratish orqali ularning tabiatda saqlanib qolishiga yordam beriladi.

Misol uchun: Neonicotinoid insektitsidlar o‘rniga ekologik xavfsiz bioinsektitsidlardan foydalanish (8-rasm).

Gulli o‘simliklar ekib, entomofaglar uchun nektar manbaini ko‘paytirish

Agroekotizimni tabiiy holatga yaqin saqlash [5]

8-rasm. Bioinsektitsidlar.

4. Entomofaglar orqali kurash.

Entomofaglar — zararkunandalar bilan oziqlanadigan yoki ularni parazitlaydigan foydali hasharotlardir. Eng ko‘p qo‘llaniladiganlari (9-rasm):

№	Entomofag turi	Zararkunanda obyekti	Qo‘llanish shakli
1	Trixogramma spp.	Karam kapalagi, paxtakorlar	Tuxum parazitari
2	Bracon hebetor	Gusenitsalar, mol kapalagi	Lichinka parazitari
3	Coccinellidae	Shira, tripslar	Yirtqich hasharot
4	Chrysopa carnea	Shira, oqqanotlilar	Yirtqich lichinka

1. Trixogramma spp. 1 mm.	2. Bracon hebetor	3. Xonqizi qo‘ng‘izi (Coccinellidae) tanasi 3–7 mm	4. Chrysopa carnea

9-rasm.

10-rasm. Entomofaglar 22 ta
http://agproekt.uz/product/adalia-bipunctata-adaliya/

1. Parazit ari Aphidius ervi	Aulacorthum solani	Macrosiphum euphorbiae	U yirik shira, ayniqsa kartoshka shiralari (Aulacorthum solani) va yirik kartoshka shiralari (Macrosiphum euphorbiae) uchun juda samarali biologik kurash vositasidir.
	2. Adalia bipunctata ikki nuqtali xonqizi sifatida ham tanilgan. Lichinkalar ham, katta yoshli hasharotlar ham (kattalar) ko'plab shira turlarining yirtqichlari hisoblanadi. Ushbu turdagi xonqizi shiraning barcha bosqichlarini yo'q qiladi, u kuniga 100 tagacha fitofaglarni eyishga qodir. Yirtqich yaralarni bir hafta ichida tozalashga qodir.		
	3. Amblyseius andersoni Bu yirtqich oqadi(trips va oqqanot)lar turli nomlar bilan tanilgan: Typhlodromus (Amblyseius) potentillae yoki Amblyseius andersoni. Bu polifag bo'lib, asosan o'rgimchak oqadilar, o't oqadilar va zang oqadilar kabi fitofaglar bilan oziqlanadi. U, shuningdek, trips, gulchang, asal o'ti va qo'ziqorinlarni ham iste'mol qiladi.		
	4. Amblyseyus californicus. Yirtqich o'rgimchak kanalarni barcha bosqichlari bilan oziqlanadi. Shuningdek, u qulupnay oqadi(trips va oqqanot)lar (Polyphagotarsonemus latus) va siklamen oqadi(trips va oqqanot)lar (Tarsonemus pallidus) ga ham hujum qiladi. Yirtqich kuniga 5 ga yaqin fitofag oqadi(trips va oqqanot)lar yo'q qilishga qodir va o'lja yo'qligida gulchanglarda omon qoladi.		
	5. Amblyseius cucumeris yuqori harakatchanligi tufayli juda ko'zga tashlanadi. Bu yirtqich oqadi(trips va oqqanot)lar asosan trips lichinkalari, ba'zan o'rgimchak oqadi(trips va oqqanot)lar va boshqa fitofag oqadi(trips va oqqanot)lar bilan oziqlanadi. Bundan tashqari, U gulchang yeyuvchi bo'lib, u shirin qalampir va baqlajon kabi gulchanglarga boy ekinlarda samarali bo'ladi.		

Entomofaglar dala sharoitida maxsus konteynerlar yordamida qo'yiladi va ularning moslashuvchanligi monitoring orqali nazorat qilinadi [6].

5. Mikrobiologik usullar.

Mikrobiologik vositalar — bakteriyalar, viruslar, zamburug'lar yoki nematodlar asosida tayyorlangan bioinsektitsidlar. Ular zararkunandalarning fiziologiyasini izdan chiqaradi, o'sishini to'xtatadi yoki nobud qiladi.

5.1. Bioinsektitsidlar — bu o'simliklarni zararkunanda hasharotlardan himoya qilish uchun ishlatiladigan, tabiiy kelib chiqishga ega bo'lgan biologik vositalardir. Ular tarkibida tirik mikroorganizmlar (bakteriyalar, zamburug'lar, viruslar) yoki ularning toksinlari, shuningdek, o'simlik yoki hayvonlardan ajratib olingan biologik faol moddalari bo'ladi.

Bioinsektitsidlarning asosiy turlari:

Bakterial bioinsektitsidlar

Masalan, Bacillus thuringiensis (Bt) bakteriyasi — bu eng ko‘p qo‘llaniladigan bioinsektitsidlardan biri bo‘lib, u hasharotlar lichinkalarini nobud qiladi. https://www.youtube.com/watch?v=3aLj1WmzL98 6.14 min.

BT Thuricide sizning bog'ingizdagi halokatli qurtlarni yo'q qilish uchun ishlaydi. Kuyalarini, shoxli qurtlarni, xalta qurtlarini va boshqa sanab o'tilgan qurtlar va liclarhinkani yo'q qiladi. Ushbu mahsulot organik bog'dorchilik uchun ishlatilishi mumkin.

Hasharotlar qotili. Bu zararkunandalarga qarshi kurash karam ilmoqlari, shox qurtlari, chodir qurtları, kuya, xalta qurti va boshqa ko'plab kasalliklarda foydalanish uchun juda yaxshi.

Mevvalar, sabzavotlar, soyali darahatlar va dezalatlarni himoya qiladi. Brokkoli, gulkaram, karam, xantal ko‘katlari, baqlajon, qalampir, qovun, pomidor, karam, soyali daraxtlar va manzarali o‘simliklarda foydalanish uchun mo‘ljallangan.

Foydali hasharotlarga zarar etmaydi. Qushlar, yomg‘ir qurtlari yoki asalarilar va xonqizilar kabi foydali hasharotlarga zarar yetkazmasdan, qurtlarni va turli bosqichidagi hasharotlarni o‘ldiradi.

Tez ta'sir etuvchi formula. Samarali bo‘lishi uchun uni qurtlar yeyishi kerak. Yutishdan so'ng, ular darhol ovqatlanishni to'xtatadi va 2-3 kun ichida o'ladi.

Mashhur vositalar:

Bacillus thuringiensis (Bt) – ko‘plab kapalak lichinkalariga qarshi samarali.

Beauveria bassiana – trips, shira, oqqanotli hasharotlarga qarshi qo‘llaniladi [7].

5.2. Zamburug‘li bioinsektitsidlar

Masalan, Beauveria bassiana, Metarhizium anisopliae — bu zamburug‘lar hasharotlar tanasiga kirib, ularning ichida ko‘payadi va o‘limiga olib keladi. https://dehaat.in/en/blog/beauveria-bassiana-eco-friendly-pest-control-solution-in-english

Bizning muhitimizda ekotizim muvozanati va qishloq xo'jaligi barqarorligiga hissa qo'shadigan ba'zi organizmlar muhim ahamiyatga ega. Bu organizmlar orasida ekinlardagi zararkunandalarga qarshi kurashdagi roli bilan mashhur bo'lgan zamburug’ turi Beauveria bassiana bor. Ilmiy jihatdan zamburug’ sifatida tasniflangan Beauveria bassiana foydali hasharotlar populyatsiyasini ko'paytirish orqali qishloq xo'jaligida muhim rol o'ynaydi. Uning ishlatilishi nafaqat kimyoviy pestitsidlarga bo'lgan ishonchni kamaytiradi, balki xavfli kimyoviy moddalarning atrof-muhitga zararini ham kamaytiradi.

Metarhizium anisopliae haqida: U biofungus hisoblanadi. U uy egasi bilan aloqa qilganda, uy egasining kutikulasiga yopishadi. Ular o'sadigan sporalardan gifa hosil qiladi, ular uy egasining tashqi himoya qatlamiga kirib, uni infektsiyalaydi.

Tavsiya etilgan ekinlar: Metarhizium anisopliae don, tariq, dukkaklilar, moyli ekinlar, tolali ekinlar, shakar ekinlari, em-xashak ekinlari, plantatsiyalar, sabzavot, mevalar, ziravorlar, gullar, dorivor ekinlar, xushbo'y ekinlar va bog'larda qo'llash uchun javob beradi.

Harakat tartibi: Metarhizium anisopliae xo'jayin bilan aloqa qilganda uning kesikulasiga yopishadi. Ular o'sadigan sporalardan gifa hosil qiladi, ular uy egasining tashqi himoya qatlamiga kirib, uni infektsiyalaydi. Asta-sekin uy egasining ichki tarkibi yo'q qilinadi.

Qo'llanilishi: 1. 10 g Metarhizium anisopliae kukunini 1 litr suvga aralashtiring. 2. Bo'laklar parchalanmaguncha yaxshilab aralashtiriladi. 3. Endi o'simliklar ustiga, shu jumladan o'simlik barglarining pastki qismiga purkaladi.

Qo'llanishi: 1. 100 g Metarhizium anisopliae kukunini 10-15 kg hovli go'ngi yoki dala tuprog'iga aralashtiring. 2. Dala tuprog'iga teng ravishda qo'llang.

Tavsiya etilgan vaqt intervali: Issiqxona uchun har 10-15 kunda qo'llash tavsiya etiladi.

5.3. Virusli bioinsektitsidlar

Masalan, Nucleopolyhedrovirus (NPV) — ayniqsa kapalak lichinkalariga qarshi samarali.

Granulovirusga asoslangan biopestitsidlarga e'tibor bering: foydalanish, ta'sir qilish tartibi va foydalari

Granuloviruslar tabiiy ravishda paydo bo'lgan viruslar bo'lib, ba'zi hasharotlar zararkunandalarining, asosan Lepidoptera tartibidagilarning lichinkalarini yuqtirish va o'ldirishga qodir. Ularning yuqori xossalari bilan ular zararkunandalarga qarshi barqaror kurash uchun kuchli yechimdir.

Granuloviruslar nima?

Granuloviruslar, shuningdek, GV deb ataladi, hasharotlarni lichinka bosqichida yuqtiruvchi viruslar turkumi. Ular Baculoviridae oilasiga mansub va hasharotlarga hujum qiluvchi boshqa viruslar guruhi, nukleopolihedroviruslar (NPV) bilan chambarchas bog'liq. Bu viruslarning barchasi bir yoki bir nechta yaqin bo'lgan hasharotlar turlariga xosdir.

Granulovirusga asoslangan biopestitsidlarning afzalliklari

Zararkunandalarga qarshi kurashda granuloviruslar ko'plab afzalliklarga ega, masalan:

Boshqa mahsulotlar bilan muvofiqligi: ta'sir qilish usuli tufayli granuloviruslar boshqa biologik va kimyoviy pestitsidlar bilan birgalikda ishlatilishi mumkin. Bu ularning zararkunandalarga qarshi kurash (IPM) dasturlari bilan ham mos kelishini anglatadi.

Zaharli bo'lmagan va qoldiqlari yo'q: granulovirus mahsulotlari mahsulotda hech qanday qoldiq qoldirmaydi, bu ularni iste'molchilar uchun xavfsiz qiladi va ishlab chiqaruvchilarga turli xil bozor imkoniyatlaridan foydalanish imkonini beradi.

O'ziga xoslik: granuloviruslar bir yoki bir nechta yaqin turlarga xos bo'lib, ularni atrofdagi foydali organizmlar uchun xavfsiz qiladi.

Kengaytirilgan raf muddati: bu mahsulotlar odatda kimyoviy pestitsidlarga o'xshash to'g'ri saqlash sharoitlari bilan uzoq muddatga ega.

5.4. Entomopatogen nematodlar

Masalan, Steinernema va Heterorhabditis jinslariga mansub nematodlar — ular hasharotlar ichiga kirib, ichki to‘qimalarni yemiradi.

Afzalliklari:

Atrof-muhit uchun xavfsiz.

Inson, hayvon va foydali hasharotlarga (masalan, asalari) kam zararli.

Zararkunandalar tezda chidamli bo‘lib qolmaydi.

Organik dehqonchilikda qo‘llash mumkin.

Kamchiliklari:

Kimyoviy insektitsidlarga nisbatan sekin ta’sir qiladi.

Maxsus saqlash va qo‘llash sharoitlarini talab qiladi.

Harorat va namlikka sezuvchan bo‘lishi mumkin.

Xulosa

Biologik kurash usullari zamonaviy qishloq xo‘jaligida ekologik barqaror va samarali himoya tizimi sifatida muhim o‘rin egallamoqda. Parazit va yirtqich entomofaglar, shuningdek entomopatogen zamburug‘lar va bakteriyalar ko‘plab zararkunandalar populyatsiyasini tabiiy usulda nazorat qilishga yordam beradi. Ushbu usullar ekotizimga kam zarar yetkazadi, pestitsidlarga nisbatan qarshilik rivojlanishini oldini oladi va inson salomatligi uchun xavfsiz hisoblanadi. Ularni turli agroekotizimlarda qo‘llash orqali barqaror hosildorlikni saqlab qolish imkoniyati ortadi.

Tavsiyalar

1. Biologik kurash turlarini fermer xo‘jaliklarida keng joriy qilish uchun mahalliy agroiqlim sharoitiga mos agentlar (foydali hasharotlar, mikroorganizmlar) bazasini kengaytirish lozim.

2. Fermerlar va agrar soha mutaxassislarini doimiy ravishda o‘qitish, ularni biologik himoya vositalarining afzalliklari va amaliyotda to‘g‘ri qo‘llash texnologiyalari bilan tanishtirish zarur.

3. Biologik kurash vositalarini kimyoviy vositalar bilan integratsiyalashgan holda qo‘llash, ekologik xavfsiz va samarali zararkunanda nazoratini ta’minlaydi.

4. Davlat miqyosida biologik himoya vositalarini qo‘llashni rag‘batlantirish siyosatini yo‘lga qo‘yish – bu mahalliy ishlab chiqaruvchilarni qo‘llab-quvvatlaydi va importga bog‘liqlikni kamaytiradi.

5. Ilmiy tadqiqotlarni kuchaytirish orqali yangi samarali biologik agentlarni aniqlash va ularni ommaviy ishlab chiqarishga joriy etish muhim ahamiyatga ega.

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SOME ASPECTS OF THE ECONOMIC AND SOCIAL DEVELOPMENT OF THE PAKHTACHI DISTRICT

Abstract. *In recent years, the leadership of the Republic of Uzbekistan has been implementing several comprehensive measures to diversify the regional economy, modernise industry and agriculture, create new production facilities, and improve social infrastructure. Pakhtachi district is one of the regions that is rapidly developing in the process of these general reforms. This article analyses the indicators of the agricultural and industrial sectors in the economic development of the Pakhtachi district based on statistical data.*

Keywords*. Pakhtachi district, GDP, rural economy, infrastructure, Zarafshan River, labour resources.*

Introduction. According to the Statistical Agency under the President of the Republic of Uzbekistan, today, 49.0 per cent of the population of our republic lives in rural areas, and 3.3 million people, or 22.8 per cent, of the economically active population are directly engaged in agricultural production. This makes the study, assessment and rational use of the economic potential of rural areas one of the urgent issues[71].

It serves to implement the tasks set out in the Resolution of the President of the Republic of Uzbekistan No. PQ-3182 dated August 8, 2017 “On priority measures to ensure the accelerated socio-economic development of regions”, the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 222 dated April 28, 2022 “On additional measures to ensure the comprehensive socio-economic development of the territories of the Samarkand region and further

[71] stat.uz - Data from the Statistical Agency under the President of the Republic of Uzbekistan.

improve the living standards of the population in 2022-2026", and other regulatory legal acts related to this activity[72].

Literature review. The founder of the direction of rural geography within socio-economic geography in the Commonwealth of Independent States is Professor S.A. Kovalev from Moscow State University. In his candidate and doctoral theses, as well as in several scientific monographs and articles from 1946 to 1963, S.A. Kovalev established rural geography as a distinct scientific discipline and developed its research methodology. Subsequently, notable research in this area has been continued and is ongoing by scientists such as B.S. Khoreyev, A.I. Alekseyev, I.K. Orfanov, T.G. Nefyodova, E.E. Leyzerovich, O.S. Rusinova, and others.

Geographical aspects of the socio-economic development of rural areas in Uzbekistan- explored by Z.M. Akramov, R. Valiyeva, E. Tashbekov, G.R. Asanov, O.B. Ata-Mirzayev, Yu.i. Akhmadaliyev, E.K. Umarov, A.S. Soliyev, A.A. Kayumov, M.I. Nazarov- are highlighted in their scientific works. The rural areas' issues during the years of independence have been examined by R.Y. Mahamadaliyev, M.I. Nazarov, and A. Sattorov as part of their candidate theses. Specific rural administrative districts served as case studies in the scientific research of K. Gadoyev, J. Musayev, and H. Omonov.

Main part. Pakhtachi District, situated in the Samarkand region of the Republic of Uzbekistan, was established on 9 February 1935 as part of the territory of Narpay District under the name Pakhtakor District. In 1963, it was re- integrated into Narpay District. However, on 12 April 1973, it was separated again as a distinct district, adopting the name Pakhtachi District.

Pakhtachi District is known for its rich history, natural resources, farming traditions, and hardworking inhabitants. It borders Narpay District to the east, Nurabad District to the south, and Khatirchi, Karmana, and Navbahor Districts of Navoi Region to the north, north-west, and west. The district covers an area of 1. 1.37 thousand square kilometres. Its population stands at 155, 000 residents (2025). The district comprises 7 towns (Ziyaudin) and 59 mahalla citizens' assemblies. It is located 140 kilometres from the regional centre. The Zirabulak and Ziyovuddin mountains, part of the Zarafshan range, divide the district into two parts: the vast, unirrigated Karnab Desert and the northern, irrigated left- bank plain of the Zarafshan Valley. The Zarafshan River flows through the northern part of the district from east to west. Due to its low bed, pumping water is challenging. The Narpay Canal, with over 370 branches, is used to irrigate crops, and water in the steppe area is supplied by pumps.

The economy of the district primarily focuses on agriculture- particularly cotton, grain, and melon cultivation- and livestock farming. There are also enterprises in the industrial, transport, and communication sectors. In 2024, our President acknowledged that "due to the correct implementation of work in the

[72] Resolution of the President of the Republic of Uzbekistan. "Development Strategy of New Uzbekistan for 2022–2026". January 28, 2022, No. PQ–60.

localities, the volume of industry in 25 districts and cities has increased by more than 10 per cent." Notably, Pakhtachi was among the regions experiencing rapid industrial growth. Additionally, 325 kilometres of drinking water networks were laid during this period, which is significant for boosting the district' s economic potential and enhancing residents' living conditions.

Pakhtachi District contributes 2.1 per cent to the industrial output of the Samarkand region (see Table 1). In 2024, industrial production in the district increased by 108.6. 6 per cent, reaching 1. 1.1 trillion soums. In particular, this growth pertains to the main product types, but the detailed breakdown is not included here.

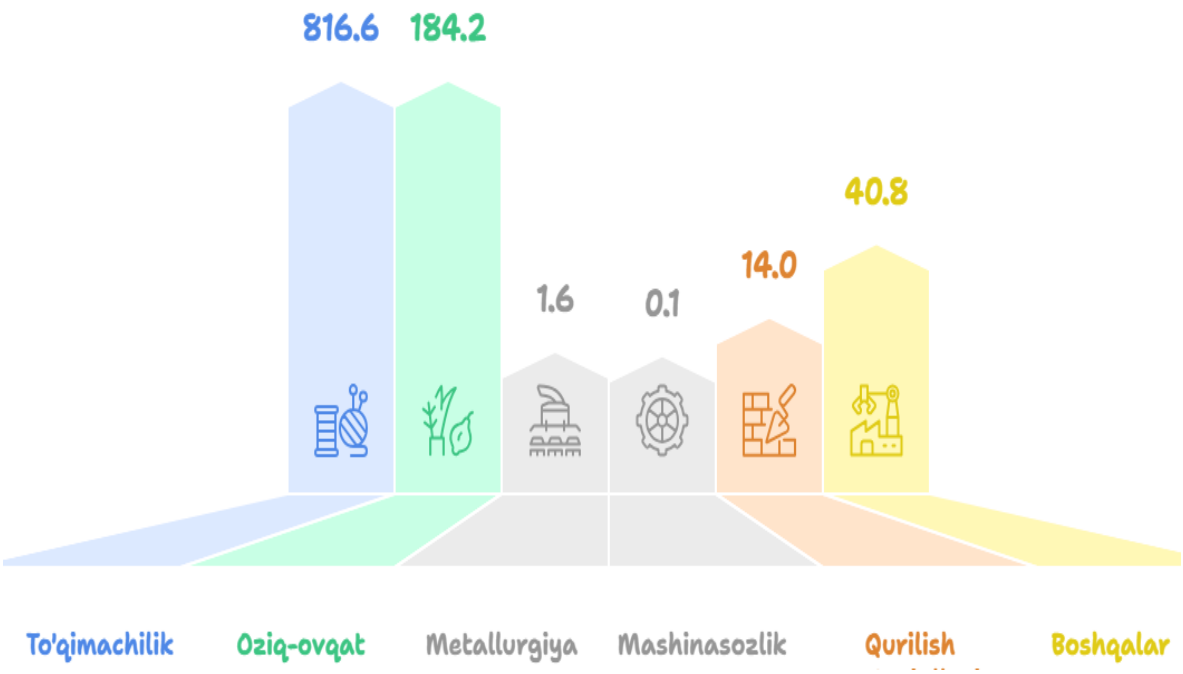

Figure 1. Volume of industrial production in Pakhtachi district.

Currently, 130 industrial enterprises are operating in Pakhtachi district, of which 6 are large and 124 are small business industrial enterprises, 37 of which were established in 2024. In 2024, 39 projects worth $37.9 million are planned to be implemented in the industrial, agricultural and service sectors, thereby creating more than 1,700 new jobs. To attract foreign investment funds, 6 foreign investment projects worth $135.3 million have been formed in the district. Of this, $64.5 million in direct foreign investments and loans are planned to be absorbed, and $8.2 million in foreign investment funds were absorbed in the first months of this year.

Table 1
Share of districts in the volume of industrial production in the Samarkand region (in per cent of the total)

	2010-year	2015-year	2020-year	2021-year	2022-year	2023-year	2024-year
Samarkand region	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**
Samarkand city	59,7	46,6	44,0	44,8	45,7	45,0	36,3
Kattakurgan city	2,5	2,4	2,2	1,7	1,4	2,3	2,4
Akdarya	1,9	2,1	2,5	2,6	1,9	2,2	2,3
Bulungur	0,8	2,8	2,6	2,3	2,3	2,2	2,3
Jambay	3,5	9,2	11,8	11,4	11,0	9,8	8,6
Ishtikhon	2,2	2,1	2,0	2,3	2,1	2,2	1,9
Kattakurgan	3,0	2,1	2,5	2,4	2,0	2,1	4,1
Kushrabat	0,7	1,0	0,4	0,4	0,4	0,4	0,4
Narpay	4,5	3,1	3,0	2,5	2,4	2,6	2,2
Payarik	2,7	2,5	2,2	2,1	2,1	2,0	1,7
Pastdargam	3,5	3,7	4,2	3,7	3,6	3,3	3,0
Pakhtachi	2,4	1,7	2,1	2,1	2,0	2,5	2,1
Samarkand	4,8	6,6	7,3	7,8	6,8	6,8	6,6
Nurabad	0,4	0,8	1,2	1,2	1,5	1,6	1,2
Urgut	5,8	10,3	8,5	7,5	7,1	7,4	8,7
Taylak	1,8	3,2	3,6	5,4	7,7	7,4	6,9

If we analyse the work on increasing the income of the population in economic figures, the volume of industrial products amounted to 749.7 billion soums at the end of 2023, compared to 206.7 billion soums in 2021. That is, the volume of industrial products increased by 3.6 times. In addition, the volume of industrial products per capita in 2021 reached 1.4 million soums, and by the end of 2023, it reached 5 million soums. The total number of registered small business entities in 2024 (excluding farms) was 596, compared to 1,416 at the end of 2023.

It is planned to create 21,954 permanent and seasonal jobs in the district in 2023. In practice, this figure amounted to 31,052, ensuring employment for unemployed and underemployed citizens. Also, within the framework of the family entrepreneurship development program in the district, 70,159 billion soums of preferential loans were allocated to 3,214 unemployed citizens.

Conclusion. Shortly, it is advisable to take into account the following for the economic and social development of the Pakhtachi district:

- The diversification of industrial sectors in the district is low. Shortly, it is important to build and launch new mining and industrial enterprises here, due to the

intensive implementation of complex mining and geological exploration work in the district.

- It is known that the district is famous for its vegetable growing. In the future, it is necessary to increase vegetable plantations and process them on the spot. Therefore, it is necessary to organise modern greenhouses for growing vegetables in the district, build processing enterprises based on the latest modern technologies and export them directly to the world market. It is necessary to further develop the volume of exports and imports and attract new investors.

- develop the building materials industry in the district by re-modernising kaolin, quartz, granite, gypsum deposits located in the territory of Karnabota and other neighbourhoods and increasing their extraction volume;

- Based on the specific natural climatic conditions of the district, it is advisable to develop the horticulture, fruit and vegetable growing, and melon growing sectors of agriculture here. Also, the large areas of pastures within the district's land fund make it advisable to develop such areas of animal husbandry as cattle breeding, sheep and goat breeding, and beekeeping.

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FORMATION OF WORD COMBINATION PARADIGMS WITH THE HELP OF SEMANTICS OF INTENSIFICATION/DEINTENSIFICATION

ABSTRACT: *It is known, the phenomenon of intensification, first of all, is manifested in direct connection with the thing in existence, the movement of events, the state. For example, the blowing of the wind and its transformation into a storm and a flood; heavy rain, i.e. torrent, hail; temperature cooling, heating, heating; such as slow, steady, fast movement of vehicles. It can also be felt in such cases as the intensive development of agriculture and production, the intensive course of teaching a certain subject. In this article the author analizes the relationship of the semantics of intensification to related categories such as: gradation, expressiveness, emotionality, assessment, imagery and emphasis and tries to show their allomorph and isomorph features.*

Key words: *intensification, gradation, expressiveness, emotionality, assessment, imagery, emphasis, allomorph and isomorph features.*

It is known that something in an objective being, the action of events occurs in different conditions and at different rates. For example, walk → run → fly; laugh → smile, etc. A person also tries to delve deeper into the extent to which actions and phenomena that occur in an objective being occur. Such relative states in the objective world are reflected in the human mind by analogy. Analogy is something in existence, a method that is of great importance in knowing phenomena. It is also used to understand, to know the reinforcement that exists in the objective case. The phenomenon of intensity is manifested, first of all, in direct connection with what is in existence, with the action, state of events. For example, wind gusts as well as its transformation into a storm and storm; rain falling strong, i.e., in the form of floods, hail; cooling, warming, warming temperatures; slow, winding, rapid movement of vehicles, etc [2, 14-18]. It can also be noticed in cases such as the intensive development of Agriculture and production, the intensive course of teaching a subject. In all the cases mentioned above, on the ground of intensity lies an increase, an increase in quantity from its normal state. Quality, quantity and norms are characteristic of things and phenomena in the material being that surround us, it is natural for them to be reflected in the language. In linguistics, there are very different opinions about the concept of" intensity". Most scholars [4, 132] view this concept as an outline of the quantitative category. They consider intensity as a semantic category, recognizing that on its basis lies the gradation of the concept of "quantity" in meaning. As we observe, such a broad review of the category of intensity started in Sh. Balli. By intensity, he understood all the differences associated with categories such as quantity, magnitude, value, power [1, 46].

Intensification is a quantitative change in quality. This change is associated with cases of deviation from the norm measure, which is important for both the speaker and the listener. Before considering the issue of the manifestation of intensity at different levels of the language, it seems necessary to comment on some terms that are used a lot in our study. They include intensive, intensifier, intensifier, deintensive, deintensifier, etc. Intensifier is a means of generating a non-normative level of intensity; the name of the intensive result is the indicator of a level above the norm in the phenomena of language. For example: the stretched A-A-A-a-intensifier containing the word l-A-a – a-rge, while the L-A-a-a-rge room is intensive. Prefixes (front suffixes) such as super-, hyper-, over-, out - in English are intensifiers. Intensifiers are means that express intensity in an explicit way [9, 12-16]. But in the semantic structure of most words, intensity semas are manifested in an implicit way. Such words are known as intensifications. Their markers are found in the semantic definition of the word. For example: Gorgeous – very beautiful: Mandy was there, looking gorgeous as usual; Rejoice – to feel very happy about something; Triumph – a great victory or success: This track has been the setting for some of her greatest triumphs; Terribly-very, or extremely: Something is terribly wrong [6, 32-35].

It is difficult to place a clear boundary between intensifiers and intensicates, since words that have intensity sememes implicitly in their semantic structure, i.e. intensifiers, can expressly reinforce the meaning of other words. For example: terrible intensifications combine with pain to become intensifiers of that word: terrible pain – very strong pain. Thus, in our opinion, in the status of an intensifier, any means can come that enhance the degree of expressiveness of the expression. In this situation, surrounded by it, there will be intensification rhymes, intensification qualities and verbs. The reverse process represents the movement of the intensity level downstream of the normative state, and is called the process of deintensification. The tools that provide this process are logically known as deintensifiers. In English, the following lexemes serve as deintensifiers: fairly, nearly, rather, partly, slightly, sometimes, something, a little, a bit (of), a shade, barely, little, scarcely, faintly, in the least, in the least, in the slightest, at all, kind of, sort of, form of, more or less, etc.

It is known that syntactic line units are formed by vocabulary, sentence and text. Among these units, there is a characteristic of mutual hierarchical organization, that is, a sentence is formed from syllables, a text is formed from sentences. The relationship of syntax with morphology is achieved through vocabulary. More precisely, from the form of a word formed by morphological means, a combination of words is formed. The morphological line consists of word forms and a system of related word categories. Let us briefly dwell on their types, since the vocabulary, which is the basic unit of the syntactic level, is associated with verbal forms, intensification/deintensification with these forms. According to traditional linguistic views, the word form is formed from the addition of affixes that give an additional meaning to the word. Affixes that form word forms are two types according to their semantic functions. The first type is limited to adding to a word and giving it an

additional grammatical meaning, not connecting the word itself being added to another word. These include the plural in the noun category, diminutive, respect-caress, degree in adjectives, and the verb-to-be-non-affixes. There is a second type of form-making affixes that give an additional meaning to the word and at the same time associate the same word with another word. These are formed by the participle, possessive, person-number affixes. This form serves to form the vocabulary and sentence of the form makers. Two types of word forms are noted: analytical and synthetic form-makers. The synthetic form is formed by adding an affix to the word [3, 32]. The analytic form, on the other hand, is formed by adding auxiliary words, i.e. auxiliary, incomplete verb, auxiliary verb, link-words to the word. Figure makers perform two different tasks at the syntactic level. It does not serve to connect words, giving only additional meaning to the word. The second type of form is involved in the generation of syntactic phenomena such as form makes (agreement, auxiliary, preposition, person-number) vocabulary, sentence.

It is known that levels other than phonological-phonetic surface units are units of-that is, units with expressive and expressed aspects. When the expression is said towards the unity of the language, in particular the sound side of the syntactic unit, the pronunciation of nomemes, the syllable, the stress aspects are understood. When said expressed, the meaning, content aspects related to objective or subjective being are understood. The phenomenon of intensification/deintensification at the syntactic level is related to both the internal (content) and external (expressive) sides of syntactic units or vocabulary, sentence, text. Below we will dwell on the intensification/deintensification of the vocabulary, which is one of the syntactic units. Vocabulary is an adaptive, controllable, terminating verbal conjugation of two or more concepts in a hokim-subordinate relation. Hence, the fact that each type of these vocabulary contains or does not have an intensification/deintensification phenomenon, when it exists, has to talk about its specific aspects. There is a phenomenon of intensification/deintensification in a vocabulary that has a connection to the consonant agreement [8, 56-58]. Vocabulary is the building material of a sentence. It has relative independence and is formed on the basis of the attitude of words. The fact that two or more words are semantically-grammatically connected to form a complex concept forms the content of the vocabulary. The valences of words determine the possibilities of their word combinations. We look at the vocabulary in this position as a relatively independent syntactic phenomenon, focusing our attention on the occurrence of the phenomenon of intensification/deintensification in it. As mentioned above, this focuses on the involvement of the intensification/deintensification vocabulary-in the expressed or expressed part. In Uzbek, the combination of the masculine pronouns with the possessive pronouns results in the intensification (emphasis, accentuation) of the expressive side. In this place, it should be noted that in Uzbek the word is not considered a noun pronoun in the acute case. This word comes in the status of an adjective in the acute case: self (how?) child. Compare: *Is Karim her own child or stepchild?*. The possessive pronoun is formed by adding a possessive pronoun to its word. These possessive pronouns are synonymous with the masculine pronoun:

self = I; yourself =you; self = he; ourselves = US; yourself =you (s); themselves =them; it is understood by itself that the quotation of a word synonym after a word leads to the emphasis (expressiveness) of the meaning of the previous word. In this case, the second sentence has expression intensification. After all, I myself in my expression is emphasizing the meaning of "I" for the fact that the pronoun itself has the meaning of me, increasing its significance in the actual division of a logical, sentence. So in Uzbek speech there is an intensification phenomenon associated with the expressive aspect of these compounds in the vocabulary of my own, your own, his own, our own, your own. In many cases my self, your own, being the dominant part of compounds such as myself, can be applied separately [2, 25]. Even in such cases, the main focus is on the words of myself, yourself, and therefore they will have a logical accent, expressiveness: *I came myself* (there are no others); *Did you come yourself*? (Others did not come?) like. In this place, it is worth paying attention to the fact that from the pronoun of the self there is a load that emphasizes the whole sentence. This download can come at the beginning, in the middle, at the end of the sentence and emphasize its meaning: a) to emphasize the meaning of the owner: *Karim himself came?* b) to emphasize the meaning of the cut: *Did Karim come himself?*

In Uzbek, there are such types of repetition that they serve as an intensification of the sign expressed or expressed by the meaning of the word. These are repetitions that arise on the basis of quality and fluency. One of them is a repetition formed on the basis of the agreement of Exodus: like the wisdom of the wise, the evil of the evil, the good of the good. In English, *horror of horrors, wonder of wonders*: one day it was discovered, horror of horrors, that a gang of gypsies had been living there. In this, the whole part (singular) is distinguished on the basis of its property, the excess of the sign, than others [5, 36]. Also found in Uzbek are repetitions that arise from the lexicalization of interrogative-response constructions: City, man, girl. In such repetitions, it is expressed that the part or singular has a strong degree of a certain sign by an incomparable, tactile way. In addition, in English, the following combinations of words also serve to express the meaning of a word to a certain extent beyond the norm. For example: *for ever, for good, for centuries/for year, on /the/ earth /not on earth/, in the world /not in the world/, for the world /not for the world/, thousands of curtains, to say a hundred times,* etc. *: Where on earth have you been walking? Where Are you walking?, damn it); He is the happiest man on the planet he is the happiest man on Earth; He is one of the most prominent literary figures in the world. He is one of the most prominent literary figures in the world.* I wouldn't go to him for the world. Inside the world, inside the world/world: he had not taken a newspaper (Ismaili M, Before dawn, P.235);– he has never taken a newspaper into his hands. Now we think about the expression of a state below the norm with the help of vocabulary. In English, *a bit of (slightly), a small way more or less, very little, bit by bit, day by day, quite a little path quite a tiny way, the tiniest issue*, etc. in Uzbek: *a sip of water, a spoonful of blood (forgive me), a sip of water, a drop of water, a word, until a drop of blood is left, a handful of people, a bridge, a dime, no hair, not worth it, thin as a stick, thin as a stick, thin*

as a bone, small as a particle, small as a linen, little-time. Look at this, the soul was left as it was doing, and this is poor.

With the syntactic unity of words in a sentence, it, in fact, has semantic material. Intensification/deintensification is when it is not about unity, that is, not about unity, but about what depends on them [7, 54]. The haplogroup model assumes that a particular nucleotide performs a communicative function, and the nucleotide performs the intensification/deintensification of nucleotide sequences. Thus, signal amplification or attenuation can be achieved by signal intensification/deintensification, which leads to an increase or decrease in signal intensity.

Our observations have shown that intensification/deintensification is characteristic of both the expressive and the expressed sides of syntactic units. When strengthening and weakening a sign is characteristic of the expressive side of a syntactic unit, the amount of the sign characteristic of the objective entity is not reduced/increased, but the strength of the expression (the tone of the word, the expressive or non-emphatic features of the word) is increased or decreased. When we say intensification/deintensification of the expressed, we mean a quantitative increase or decrease in the sign characteristic expressed in it. Increasing the expressive side is considered a phenomenon of emphasis, accentuation in speech (sentence).

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ГЕОЭКОЛОГИЧЕСКИЕ АСПЕКТЫ МОДЕРНИЗАЦИИ СЕТИ ОХРАНЯЕМЫХ ПРИРОДНЫХ ТЕРРИТОРИЙ

Аннотация. *В статье рассматриваются геоэкологические аспекты модернизации сети охраняемых природных территорий (ООПТ) в контексте глобализационных процессов. Анализируется современное состояние системы ООПТ, выявляются пространственные и экологические противоречия в их функционировании. Предлагаются направления трансформации природоохранной политики с учётом международных стандартов, ландшафтного планирования и концепции экологической устойчивости. Подчёркивается значимость интеграции пространственного анализа и экологического планирования для оптимизации сети ОПТ.*

Ключевые слова*: охраняемые природные территории, геоэкология, устойчивое развитие, природоохранное зонирование, экологический каркас, ландшафтная устойчивость.*

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GEOECOLOGICAL ASPECTS OF MODERNIZING THE NETWORK OF PROTECTED NATURAL AREAS

Abstract. *The article examines the geoecological aspects of modernizing the network of protected natural areas (PNAs) in the context of globalization processes. The current state of the PNA system is analyzed, and spatial and ecological contradictions in their functioning are identified. The authors propose directions for transforming environmental protection policies in accordance with international standards, landscape planning principles, and the concept of ecological sustainability. The importance of integrating spatial analysis and ecological planning for optimizing the PNA network is emphasized.*

Keywords: *protected natural areas, geoecology, sustainable development, environmental zoning, ecological framework, landscape sustainability.*

В условиях усиливающейся глобализации возрастает значение охраняемых природных территорий как элементов глобального экологического каркаса. Это обусловлено как внутренними экологическими вызовами (деградация земель, опустынивание, потеря биоразнообразия), так и международными обязательствами в рамках Конвенции о биологическом разнообразии, Парижского соглашения по климату и других международных актов. Текущий век ознаменован «Повесткой дня на XXI век», принятой мировым сообществом, которое признаёт, что мир должен перейти к новому этапу развития взаимоотношений в системе «Человек-Природа-Общество», а именно, от экологизации сознания к новому экологическому мировоззрению, т.е. гармоничному сочетанию и взаимодействию при решении задач экономико-социального развития и сохранения в благоприятном состоянии окружающей среды, природных ресурсов для будущих поколений [2].

Геоэкологические основы модернизации охраняемые природные территории (ОПТ) — это научный фундамент, на основе которого осуществляется рациональное обновление и эффективное управление охраняемыми территориями, с учётом: природных условий (климат, рельеф, вода, почва); экологической ценности; устойчивости к антропогенным воздействиям; и задач устойчивого развития.

Для Республики Узбекистан, обладающей уникальным природным и ландшафтным разнообразием, модернизация существующей сети ООПТ становится стратегически важной задачей. Узбекистан обладает уникальным биоразнообразием, сформированным в условиях аридного климата и сложного рельефа. В условиях интенсификации хозяйственного освоения и изменения климата вопросы сохранения природного наследия обретают приоритетное значение. Особую роль в этом процессе играют охраняемые природные территории, которые требуют пересмотра своей структуры, функционального наполнения и механизмов управления с учётом геоэкологических факторов. Цель исследования — обосновать модернизации ОПТ Узбекистана на основе ландшафтного и экосистемного подходов, пространственного анализа и принципов устойчивого природопользования.

Охраняемые природные территории (ОПТ) Узбекистана имеют необычайно важную роль в сохранении регионального биологического и

ландшафтного разнообразия Средней Азии. Благодаря созданию новый ОПТ и совершенствование экологического каркаса удалось сохранить и восстановить популяции многих редких, исчезающих видов нашей флоры и фауны. За последние десятилетия, в результате усиления природопользования, многие виды животных Узбекистана испытали на себе сильное антропогенное воздействие, сократили свой ареал и численность; некоторые из них полностью исчезли. Наибольшей угрозе подвергаются крупные виды млекопитающих и птиц, имеющие большую практическую ценность как объекты охотничьего промысла, а также эндемичные и локально распространенные виды, встре чающиеся в пределах уязвимых, интенсивно осваиваемых человеком экосистем [1].

В данное время в Республике Узбекистан количество ОПТ составляет 180 (не включая ОПТ имеющие местное значение), занимаемая площадь составляет 67500.41 км^2, по отношению к общей площади Республики составляет более 15 %[73]. Но анализ состояния системы охраняемых природных территорий Республики Узбекистана в частности показал, что внедрит новые категории охраняемых территорий и управление ими нуждается в модернизации.

Геоэкология как междисциплинарная наука объединяет методы географии, экологии, ландшафтоведения и ГИС-технологий для анализа природных и антропогенных процессов в пространственной организации территорий. При модернизации ОПТ используются следующие подходы: Ландшафтный подход рассматривает природную территорию как функционально целостную систему с внутренней структурой и взаимосвязями; Экологический каркас: включает ключевые ядра (core areas), экокоридоры (corridors) и буферные зоны; Принцип репрезентативности и устойчивости: ОПТ должны охватывать ключевые типы ландшафтов и биогеоценозов, устойчивых к изменениям; Геоинформационный анализ: позволяет выявить пробелы в охвате экосистем, оценить степень фрагментации, определить оптимальные участки для расширения или реорганизации ОПТ.

Одним из значимых транснациональных факторов глобальной системы для ОПТ является Всемирный союз по охране природы (МСОП). Действуя на международном уровне он объединяет государства, правительственные ведомства и широкий спектр разнообразных неправительственных организаций (НПО), являясь примером глобального мирового партнерства. Миссия МСОП заключается в осуществлении руководства и оказании содействия мировому природоохранному движению для поддержки целостности и сохранения разнообразия живой природы и обеспечения использования человеком природных ресурсов на устойчивой и разумной основе [8]. Процесс глобализации в развитии систем и для оптимального

[73] Реестр учёта паспортов охраняемых природных территорий Узбекистана // Эл. доступ: http://uznature.uz (веб-сайт Государственного комитета по охране природы Республики Узбекистан).

набор ОПТ в Узбекситане необходимо использовать комплексную социо-эколого-экономическую оценку. Поэтому для развития и оптимизации ОПТ в нашей Республике должны осуществлять следующие приоритетные задачи:

Эколого-географический анализ репрезентативности Узбекистана к созданию и развитию ООПТ. Создание охраняемых природных территорий обеспечивает сохранение ресурсов, в том числе, уникальных и невосполнимых, ценность которых в современном мире постоянно возрастает. Таким образом, можно рассматривать охраняемую природную территорию как регулируемую ресурсосберегающую систему. ОПТ выполняя ресурсосберегающую, эталонную, резерватную, средообразующую и функцию, является самостоятельной регулируемой системой и выступает субъектом социально-экономических отношений.

Для сохранения биологических и ландшафтных разнообразии ОПТ должны иметь оптимальное размеры. Единая система ОПТ состоит из площадей организованными в административных районах. При этом в каждой области должен быть оптимальный выбор территории для всех категорий ОПТ. Например, в Республике Каракалпакистан, Ташкентском, Кашкадарьинском, Джизакском, Бухарском, Самаркандском, Сурхандарьинском и Хорезмском областях доля ОПТ (категории Ia, Ib, II) более 1% от общего занимающего ими площадое. Низкий показатель (ниже 1%) в Андижанском, Наманганском, Сырдарьинском и Ферганском областях, в основном этих областях осуществляется и проводится охрана природных памятников заповедным режимом [6]. Поэтому, оптимальный подбор по категориям системы ОПТ надо проводить в о всех административных районах.

При оптимальном выборе ОПТ по административным территориям должны быть учтены соотношения площади, используемой в интенсивном и экстенсивном порядке. Наиболее ощутимые результаты выявлены в областях Ферганской долины, что в системе геотирона “население-хозяйство–территория” антропогенное давление на природу очень высокое [3]. Поэтому, при интенсивном освоении территории небходимо учитывать существование редких природных объектов и их охрану под влиявлением хозяйственной деятельности человека, где редкие и уникальные обекты постепенно теряют свой облик и ценность.

Формирование экологического каркаса как форма организации территории. Под экологическим каркасом при этом понимается система наиболее ценных по своим природным характеристикам участков территории. Экологический каркас территории (ЭКТ) является составной (неразрывной) частью активной системы «Человек-Природа-Общество», функционирует и развивается в границах конкретной территории. На каждой схеме подчеркнуты пункты, отражающие социально-экономическую значимость ОПТ. Выявлены новые задачи организации, решение которых способствует интеграции ОПТ в социально-экономическую жизнь местных сообществ, а также в социокультурную, эколого-просветительскую сферу всего общества. При этом обеспечение природно-функциональной целостности системы

происходит за счет нормирования всей антропогенной деятельности, как на каркасных, так и межкаркасных территориях с учетом общих принципов управления. В итоге создаются благоприятные возможности поддерживающие экологическое равновесие, создающее природные условия, ресурсосберегающий и обогающие способности.

Процесс создания репрезентативной сети охраняемых природных территории (ОПТ) неизбежно связан с созданием новых и изменением существующих охраняемых территорий. При этом важным является вопрос о выборе категории ООПТ. От него зависит приоритет природоохранных задач, режим охраны, возможный профиль и зонирование создаваемой ООПТ. В настоящее время ООПТ имеются практически во всех странах мира. При этом в большинстве государств существуют свои специфические категории ООПТ, представление о которых формировалось постепенно, впитывая национальные традиции и опыт других стран. Вследствие чрезвычайно большого разнообразия ООПТ, классификации, которая охватывала бы все известные в мире категории, до сих пор не создана [4]. Целью данных исследований являлось определение возможности расширения региональной сети ОПТ за счет увеличения количества ОПТ природно-эталонного типа, а также выявление структурно-функциональных частей природно-экологического каркаса Республики.

Небходимость единого координационного учреждения при распределении задач и развитии системы ОПТ. Деятельность многих ОПТ малоэффективна из-за плохой законодательной защиты и правовой неопределенности их статуса. Каждая страна должна иметь хорошо разработанную правовую основу, на которой можно было бы построить любую систему ОПТ и законодательно защитить ее объекты от соблазна немедленного получения максимальной прибыли.

Освещенные ранее государственные и международные концепции развития территорий особой охраны можно отнести к источникам изменений. Фактором, непосредственным атрибутом практических преобразований можно назвать экологический туризм. В целях развития экологического туризма как необходимой составляющей деятельности ООПТ требуются практические, технологические преобразования, кадровые изменения состава сотрудников, развитие инфраструктуры. Таким образом, экологический туризм является фактическим «двигателем», мотиватором изменений в структуре, функциях и правилах управления ООПТ [5, 7].

Заключение. Созданное единственное учреждение занимающееся организацией и развитием дел по системе ОПТ в Республике, не имеет единой системы управления, а подчиняется четырем организациям. Модернизация системы охраняемых природных территорий в Узбекистане требует внедрения геоэкологических подходов, гармонизации с международными стандартами и межведомственной интеграции. Только системное и научно обоснованное развитие сети ОПТ позволит обеспечить сохранение природного капитала страны в условиях усиливающегося глобального антропогенного давления.

В связи с развитием и увеличением площади ОПТ требует единую систему организации деятельности. При этом необходимо обратить внимание на следующее: организовать единую систему управления дальнейщего развития ОПТ и соответственное правление по оптимизации всех функциий, организации согласно направлением иерархического административного управления.

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РАЗРАБОТКА ИНТЕЛЛЕКТУАЛЬНЫХ СТРОИТЕЛЬНЫХ РЕШЕНИЙ С ПРИМЕНЕНИЕМ AI И BIM В УСЛОВИЯХ ЖАРКОГО КЛИМАТА ЦЕНТРАЛЬНОЙ АЗИИ

Аннотация: *В данной работе рассматривается роль искусственного интеллекта в оптимизации систем отопления, вентиляции и кондиционирования воздуха в строительной отрасли с учетом климатических условий региона. Анализируется влияние использования алгоритмов машинного обучения и цифровых двойников на повышение энергоэффективности и сокращение эксплуатационных расходов при проектировании и эксплуатации зданий. Предоставляется обзор аспектов, связанных с интеграцией интеллектуальных систем управления HVAC в BIM-модели, что позволяет обеспечить стабильность микроклимата и комфортные условия в помещениях в условиях жаркого климата.*

Ключевые слова: *климат, здания, энергия, вентиляция, охлаждение, устойчивость, автоматизация, комфорт*

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DEVELOPING INTELLIGENT CONSTRUCTION SOLUTIONS USING AI AND BIM IN THE HOT CLIMATE OF CENTRAL ASIA

Abstract: *This paper examines the role of artificial intelligence in optimizing heating, ventilation, and air conditioning (HVAC) systems in the construction industry, taking into account the climatic conditions of the region. It analyzes the impact of using machine learning algorithms and digital twins to improve energy efficiency and reduce operating costs in the design and operation of buildings. An overview of aspects related to the integration of intelligent HVAC control systems into BIM models is provided, which helps ensure a stable microclimate and comfortable indoor conditions in hot climates.*

Keywords: *climate, buildings, energy, ventilation, cooling, sustainability, automation, comfort*

В условиях стремительного роста урбанизации и изменения климатических параметров региона разработка энергоэффективных и адаптивных строительных решений становится одним из приоритетных

направлений для стран Центральной Азии. Суровый жаркий климат, характеризующийся высокими температурами, дефицитом осадков и интенсивным солнечным излучением, требует внедрения технологий, позволяющих снизить тепловую нагрузку на здания и обеспечить комфортные условия проживания при минимальных затратах энергии. В данных условиях Building Information Modeling (BIM) открывает возможности для комплексного планирования, моделирования и оптимизации архитектурных и инженерных решений с учетом специфики климата региона.

Применение искусственного интеллекта (AI) в сочетании с BIM позволяет анализировать большие объемы климатических данных, прогнозировать эксплуатационные характеристики зданий и формировать интеллектуальные рекомендации по выбору материалов, инженерных систем и архитектурных решений. Эти подходы способствуют созданию «умных» зданий, которые учитывают сезонные колебания температуры и влажности, минимизируют теплопотери и избыточные теплопритоки, сокращают потребление воды и электроэнергии. Таким образом, интеграция AI и BIM в проектирование зданий в условиях жаркого климата Центральной Азии является стратегическим направлением повышения энергоэффективности, устойчивости и качества городской среды региона.

Методика параметрической климатической оптимизации с использованием AI и BIM. Методика основана на интеграции параметрического моделирования в BIM с алгоритмами искусственного интеллекта для проектирования зданий, адаптированных к условиям жаркого климата Центральной Азии. Сначала осуществляется сбор климатических данных региона, включая суточные и сезонные колебания температуры, влажности, скорости ветра и уровня солнечной радиации. Эти данные загружаются в BIM-модель здания, после чего проводится серия расчетов по тепловому анализу, моделированию солнечного облучения и воздушных потоков. На этом этапе используются алгоритмы машинного обучения для выявления зависимостей между архитектурными параметрами здания и его энергетическими характеристиками.

После проведения анализа AI-алгоритмы формируют оптимизированные рекомендации по ориентации здания, параметрам остекления, теплоизоляции, а также по интеграции пассивных систем охлаждения и вентиляции. Эти рекомендации встраиваются в BIM-модель, где в реальном времени можно проверить влияние изменений на энергопотребление и температурный комфорт внутри здания. Такой подход позволяет проектировать энергоэффективные здания, снижающие тепловую нагрузку и эксплуатационные расходы в условиях жаркого климата региона, при этом повышая качество и устойчивость городской застройки.

В результате проведенного исследования с использованием методики параметрической климатической оптимизации было установлено, что применение алгоритмов искусственного интеллекта в сочетании с BIM позволяет сократить тепловые потери зданий на 18 процентов и снизить

избыточные теплопритоки на 23 процента по сравнению с традиционными методами проектирования. Оптимизация параметров остекления, ориентации здания и использования систем пассивного охлаждения позволила стабилизировать внутренний температурный режим в летний период на уровне 24-26 градусов без дополнительных затрат на кондиционирование в течение 64 процентов времени эксплуатации.

Результаты моделирования также показали снижение общего энергопотребления на 21 процент за счет более эффективного использования естественного освещения и вентиляции в условиях жаркого климата Центральной Азии. Внедрение предложенной методики позволило адаптировать архитектурные и инженерные решения под реальные климатические условия региона, повысить устойчивость зданий к высоким температурам и создать более комфортную среду обитания для пользователей при минимизации эксплуатационных расходов.

Основываясь на проведенном исследовании, можно сделать вывод, что интеграция BIM и алгоритмов искусственного интеллекта в проектирование зданий в условиях жаркого климата Центральной Азии является эффективным инструментом повышения энергоэффективности и качества городской застройки. Результаты показали значительное снижение тепловых потерь и избыточных теплопритоков, а также сокращение энергопотребления за счет использования пассивных систем охлаждения, оптимальной ориентации зданий и рационального использования естественного освещения и вентиляции. Применение параметрической климатической оптимизации в проектировании позволяет адаптировать архитектурные решения к реальным климатическим особенностям региона, создавая комфортные условия для пользователей при снижении эксплуатационных расходов. Данный подход подтверждает перспективность использования интеллектуальных технологий в строительстве, открывая возможности для дальнейших исследований в области устойчивого проектирования и развития городской среды, соответствующей современным требованиям энергоэффективности и экологической безопасности.

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ОПТИМИЗАЦИЯ ПРОЕКТИРОВАНИЯ И СТРОИТЕЛЬСТВА В УЗБЕКИСТАНЕ С ИСПОЛЬЗОВАНИЕМ ТЕХНОЛОГИИ ИНФОРМАЦИОННОГО МОДЕЛИРОВАНИЯ ЗДАНИЙ

Аннотация: *В данной работе рассматривается использование технологии информационного моделирования зданий (BIM) в современном строительстве как одного из ключевых инструментов повышения эффективности проектирования и управления строительными процессами. Анализируются аспекты применения BIM на различных этапах жизненного цикла объекта, включая подготовку проектной документации, проведение коллизионного анализа и контроль качества строительных работ. Отмечается, что использование BIM способствует повышению точности проектных решений, снижению количества ошибок и сокращению сроков согласования в процессе реализации строительных проектов.*

Ключевые слова: *проектирование, строительство, эффективность, модель, анализ, управление, эксплуатация, технология, Узбекистан*

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OPTIMIZING DESIGN AND CONSTRUCTION IN UZBEKISTAN USING BUILDING INFORMATION MODELING (BIM) TECHNOLOGY

Abstract: *This paper examines the use of building information modeling (BIM) technology in modern construction as one of the key tools for improving the efficiency of design and management of construction processes. The aspects of BIM application at various stages of the facility life cycle are analyzed, including the preparation of design documentation, conducting collision analysis and quality control of construction work. It is noted that the use of BIM helps to increase the accuracy of design solutions, reduce the number of errors and reduce the time for approval in the process of implementing construction projects.*

Keywords*: design, construction, efficiency, model, analysis, management, operation, technology, Uzbekistan*

В современном строительном комплексе Узбекистана растёт необходимость повышения эффективности проектирования и управления строительством, что связано с активным развитием городской

инфраструктуры и переходом к энергоэффективным и ресурсосберегающим технологиям. Одним из наиболее перспективных направлений в решении этих задач является внедрение технологии информационного моделирования зданий (BIM), которая позволяет объединить все стадии жизненного цикла объекта в едином цифровом пространстве. Использование BIM в проектировании позволяет оптимизировать процессы согласования, повысить точность расчётов, снизить затраты за счёт уменьшения количества проектных ошибок и коллизий на этапе строительства.

Методика интеграции BIM для повышения эффективности строительства в Узбекистане. В основе методики лежит комплексная интеграция BIM на всех этапах жизненного цикла объекта от предпроектных исследований до ввода в эксплуатацию с учётом локальных строительных норм Узбекистана. На первом этапе проводится подготовка данных для информационной модели здания, включая геодезические изыскания, сбор архитектурных и инженерных решений и создание единого цифрового каталога строительных элементов. Это позволяет формировать точные объемные модели и автоматизировать подсчёт материалов и ресурсов для корректного планирования бюджета и сроков строительства. Второй этап заключается в проведении коллизионного анализа с помощью BIM-инструментов для выявления несоответствий между разделами проекта и сокращения риска ошибок в процессе строительства. Использование модели позволяет оперативно изменять проектные решения в зависимости от корректировок заказчика и новых данных, без необходимости полной переработки чертежей. Такой подход сокращает потери времени и финансов при реализации объектов и позволяет контролировать соответствие фактического строительства проектным параметрам.

Третий этап предусматривает использование BIM в управлении строительным процессом с интеграцией графика выполнения работ и планирования ресурсов. Модель используется для мониторинга прогресса строительства в реальном времени и проведения сравнительного анализа с графиком работ, что позволяет вовремя выявлять отклонения и устранять их. По завершении строительства BIM-модель применяется для эксплуатации объекта, облегчая процессы технического обслуживания и планирования ремонта, а также формируя цифровую базу для последующего анализа энергоэффективности здания.

В результате проведенного исследования на базе разработанной методики интеграции BIM в строительные проекты Узбекистана было установлено, что применение информационного моделирования позволило сократить сроки проектирования и согласования на 25 процентов. За счет использования единой цифровой модели удалось устранить несоответствия между разделами проекта еще на стадии подготовки, что позволило ускорить процесс утверждения рабочей документации и снизить количество повторных согласований с подрядчиками и техническим надзором.

На этапе строительства применение BIM позволило уменьшить количество строительных ошибок и пересмотров проектных решений на 30 процентов. Коллизионный анализ в модели выявил и устранил пересечения инженерных сетей и несостыковки конструктивных элементов, что снизило объем внеплановых работ и затрат на их исправление. Мониторинг хода строительства через информационную модель позволил фиксировать и своевременно устранять отклонения от графика выполнения работ, что обеспечило выполнение ключевых этапов строительства в запланированные сроки.

После ввода объектов в эксплуатацию использование BIM показало повышение качества технического обслуживания за счет наличия полной цифровой базы данных о зданиях. Снижение времени на планирование и проведение технических осмотров и ремонтов составило 20 процентов, а также повысилась прозрачность учета эксплуатационных характеристик. Исследование подтвердило, что применение методики позволяет повысить эффективность управления строительными проектами в Узбекистане, сокращая временные и финансовые издержки и повышая качество реализуемых объектов.

Основываясь на проведенном исследовании, можно сделать вывод, что интеграция технологии информационного моделирования зданий в проектирование и строительство в Узбекистане является эффективным инструментом повышения качества и скорости реализации строительных проектов. Использование BIM позволило оптимизировать процесс проектирования, сократить сроки согласования и устранить ошибки еще на стадии подготовки, что положительно сказалось на снижении затрат и времени строительства. Создание единой цифровой модели обеспечило прозрачность взаимодействия между участниками проекта и повысило точность планирования всех этапов строительства.

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СРАВНИТЕЛЬНЫЙ АНАЛИЗ ТРАДИЦИОННОГО И BIM-ОРИЕНТИРОВАННОГО ПРОЕКТИРОВАНИЯ В СТРОИТЕЛЬНОЙ ПРАКТИКЕ УЗБЕКИСТАНА

Аннотация: *В данной работе рассматривается использование инновационных технологий в строительной отрасли Узбекистана, с акцентом на применение BIM-технологий в проектировании и управлении строительными процессами. Анализируются преимущества цифрового моделирования зданий для оптимизации проектных решений, сокращения времени и затрат при реализации строительных проектов. Предоставляется обзор практических примеров внедрения BIM в условиях Узбекистана, выделяются ключевые аспекты повышения эффективности взаимодействия между проектировщиками, инженерами и заказчиками.*

Ключевые слова: *проектирование, строительство, эффективность, моделирование, цифровизация, Узбекистан, инновации*

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COMPARATIVE ANALYSIS OF TRADITIONAL AND BIM-ORIENTED DESIGN IN CONSTRUCTION PRACTICE OF UZBEKISTAN

Abstract: *This paper examines the use of innovative technologies in the construction industry of Uzbekistan, with an emphasis on the use of BIM technologies in the design and management of construction processes. The advantages of digital modeling of buildings for optimizing design solutions, reducing time and costs in the implementation of construction projects are analyzed. An overview of practical examples of BIM implementation in the context of Uzbekistan is provided, key aspects of increasing the efficiency of interaction between designers, engineers and customers are highlighted.*

Keywords: *design, construction, efficiency, modeling, digitalization, Uzbekistan, innovations*

В условиях активного развития строительной отрасли Узбекистана повышаются требования к качеству, скорости и экономической эффективности проектных и строительных работ, что обуславливает необходимость внедрения современных технологий управления проектами.

На протяжении многих лет в стране применялись традиционные методы проектирования, которые основываются на поэтапной разработке проектной документации и последующей передаче информации между участниками строительства преимущественно в бумажной или несогласованной цифровой форме. Такой подход сопровождается рисками несостыковок в чертежах, недостаточной прозрачностью процессов, потерями времени на согласование изменений и увеличением затрат на устранение ошибок в процессе строительства.

Методика сравнительной оценки эффективности внедрения BIM-технологий в строительной практике Узбекистана. Методика направлена на поэтапную оценку преимуществ и ограничений использования BIM по сравнению с традиционным проектированием в реальных условиях строительных компаний Узбекистана. На первом этапе проводится выбор типовых объектов, которые ранее проектировались с применением традиционных методов, и аналогичных объектов, разрабатываемых с использованием BIM. Для сбора данных создаются рабочие группы с участием проектировщиков, инженеров и экономистов, фиксируются показатели затрат времени на проектирование, количество внесенных изменений, сроки согласования, а также данные по расходам на устранение ошибок в проектной документации. На втором этапе методика предполагает анализ показателей эффективности реализации проектов на строительной площадке. Сопоставляются фактические сроки строительства, объемы отклонений от проектных решений, количество коллизий, выявленных на стадии строительства, а также показатели себестоимости строительства для объектов, выполненных традиционным способом и с применением BIM. Отдельное внимание уделяется анализу взаимодействия участников процесса, уровню прозрачности и контролю за выполнением работ при двух подходах, что позволяет выявить управленческие и организационные различия.

На заключительном этапе проводится экспертная оценка перспектив расширенного внедрения BIM в строительную практику Узбекистана. Анализируются результаты опросов проектировщиков и строителей, выявляются ключевые барьеры, связанные с кадровой подготовкой, нормативной базой и технологической оснащенностью организаций. На основании проведенного анализа формируются рекомендации по этапному переходу на BIM-ориентированное проектирование в Узбекистане с учетом выявленных преимуществ, а также создается база показателей для использования в дальнейших исследованиях и подготовке программ внедрения BIM в строительных организациях страны.

В результате проведенного исследования установлено, что при использовании BIM-ориентированного проектирования время, затрачиваемое на подготовку проектной документации, сократилось в среднем на 25 процентов по сравнению с традиционными методами. Количество ошибок и несостыковок в проектной документации снизилось на 40 процентов, что позволило уменьшить затраты на их устранение еще на этапе проектирования.

В процессе согласования проектов с государственными органами и заказчиками наблюдалось сокращение сроков на 30 процентов за счет использования единой цифровой модели и возможности быстрого внесения корректировок.

При анализе показателей эффективности на строительной площадке установлено, что объекты, спроектированные с использованием BIM, демонстрируют снижение количества коллизий в процессе строительства на 45 процентов, что позволило предотвратить задержки и перерасход материалов. Фактические сроки строительства сократились в среднем на 18 процентов, при этом фиксировалось повышение качества исполнения строительных работ за счет более точного понимания проектных решений всеми участниками процесса. Себестоимость строительства на ряде объектов снизилась на 10-12 процентов за счет уменьшения затрат на исправление ошибок и оптимизации закупок материалов.

По итогам опроса участников проектов, 82 процента проектировщиков и инженеров отметили, что внедрение BIM повышает удобство взаимодействия между смежными специалистами и заказчиком, а 74 процента респондентов указали на снижение стресса в процессе работы благодаря прозрачности контроля и наглядности данных. Исследование подтвердило, что использование BIM в строительной практике Узбекистана способствует повышению управляемости проектами, сокращению сроков реализации и снижению издержек, создавая условия для более эффективного использования ресурсов в отрасли.

Основываясь на вышеуказанной информации, можно сделать вывод, что внедрение BIM-ориентированного проектирования в строительной практике Узбекистана обеспечивает значительное повышение эффективности на всех этапах жизненного цикла объекта. Сокращение времени проектирования, снижение количества ошибок и улучшение взаимодействия участников процесса создают условия для более качественной подготовки проектной документации и своевременного согласования с заинтересованными сторонами. Полученные данные подтверждают, что переход к BIM способствует оптимизации затрат и времени на строительство, повышая управляемость проектами и снижая риски возникновения ошибок и коллизий в процессе реализации объектов.

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ОЦЕНКА ЭФФЕКТИВНОСТИ ПРИМЕНЕНИЯ BIM И МАШИННОГО ОБУЧЕНИЯ В УПРАВЛЕНИИ ЖИЗНЕННЫМ ЦИКЛОМ ЗДАНИЙ В РЕСПУБЛИКЕ УЗБЕКИСТАН

Аннотация: *В данной работе рассматривается применение BIM-технологий и методов машинного обучения в управлении жизненным циклом зданий в Республике Узбекистан. Анализируются преимущества использования информационного моделирования на этапах проектирования, строительства и эксплуатации объектов, а также аспекты повышения эффективности процессов за счет цифровизации строительной отрасли. Предоставляется обоснование необходимости внедрения BIM для сокращения сроков реализации проектов, снижения затрат и повышения качества управления инженерными системами с учетом климатических и инфраструктурных особенностей страны.*

Ключевые слова: *здания, цикл, данные, прогноз, анализ, модели, управление, эффективность, Узбекистан*

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EVALUATION OF THE EFFECTIVENESS OF BIM AND MACHINE LEARNING IN BUILDING LIFECYCLE MANAGEMENT IN THE REPUBLIC OF UZBEKISTAN

Abstract: *This paper examines the application of BIM technologies and machine learning methods in life cycle management of buildings in the Republic of Uzbekistan. The advantages of using information modeling at the stages of design, construction and operation of facilities, as well as aspects of improving the efficiency of processes through digitalization of the construction industry are analyzed. A rationale is provided for the need to implement BIM to reduce project implementation times, reduce costs and improve the quality of engineering systems management, taking into account the climatic and infrastructural features of the country.*

Keywords: *buildings, cycle, data, forecast, analysis, models, management, efficiency, Uzbekistan*

В условиях ускоренной урбанизации и необходимости повышения энергоэффективности зданий в Республике Узбекистан возрастает актуальность внедрения инновационных технологий управления строительством и эксплуатации объектов недвижимости. Среди таких технологий особое место занимает информационное моделирование зданий (BIM), которое позволяет формировать цифровой двойник объекта и обеспечивает комплексный контроль на всех стадиях жизненного цикла здания — от проектирования до демонтажа. Применение BIM способствует сокращению издержек, снижению количества ошибок при строительстве, а также повышению прозрачности взаимодействия между участниками проекта.

Методика комплексной оценки эффективности внедрения BIM и машинного обучения в управлении жизненным циклом зданий. Методика основана на сборе и анализе данных по реальным строительным объектам, где применяется BIM в сочетании с алгоритмами машинного обучения. Для этого осуществляется выборка объектов различного назначения в Узбекистане с учетом стадий проектирования, строительства и эксплуатации, после чего данные о сроках реализации, затратах, энергопотреблении, техническом обслуживании и количестве выявленных дефектов заносятся в аналитическую таблицу. При этом фиксируются показатели по объектам, где BIM и машинное обучение не используются, что позволяет провести сравнительный анализ.

На втором этапе осуществляется обучение моделей машинного обучения на собранных данных для прогнозирования технического состояния зданий, оценки износа инженерных систем и анализа фактического потребления ресурсов. Прогнозные значения сопоставляются с фактическими показателями для определения точности моделей и выявления участков, где применение алгоритмов дает наибольший экономический и эксплуатационный эффект. Это позволяет определить, какие виды данных и параметров жизненного цикла наиболее значимы для прогнозирования и управления.

В заключение проводится расчет интегрального показателя эффективности, учитывающего снижение времени строительства, уменьшение эксплуатационных расходов и рост срока службы объектов. Данный показатель используется для обоснования экономической целесообразности внедрения BIM и машинного обучения в строительные проекты Узбекистана, а также для формирования рекомендаций по корректировке нормативной базы и образовательных программ в сфере строительства и управления недвижимостью.

В ходе проведенного исследования на базе разработанной методики было проанализировано 12 объектов в Республике Узбекистан, среди которых жилые и административные здания, где использовались технологии BIM и машинного обучения, а также 10 объектов без применения данных технологий. Сбор данных показал, что средняя продолжительность этапа проектирования сократилась на 18 процентов, а срок строительства в среднем

снизился на 14 процентов за счет более точного планирования и выявления ошибок на стадии цифрового моделирования. Использование BIM позволило оперативно корректировать проектные решения с учетом климатических и инженерных особенностей регионов страны.

Применение алгоритмов машинного обучения при эксплуатации зданий позволило снизить затраты на техническое обслуживание и выявление неисправностей инженерных систем на 22 процента, что связано с возможностью прогнозирования состояния оборудования и своевременного проведения профилактических работ. Снижение аварийных ситуаций и сбоев в работе систем водоснабжения и электроснабжения составило 16 процентов, что положительно повлияло на надежность функционирования объектов. Анализ данных подтвердил, что использование машинного обучения способствует более точному учету реального износа конструктивных элементов зданий.

Интегральный показатель эффективности применения BIM и машинного обучения в управлении жизненным циклом зданий в Узбекистане составил 19 процентов по сравнению с традиционными методами, что подтверждает экономическую и эксплуатационную целесообразность их внедрения в строительную отрасль страны. Эти результаты свидетельствуют о необходимости расширения практики использования цифровых технологий для повышения качества проектирования, сокращения затрат и продления срока эксплуатации объектов с учетом особенностей климатических условий и инфраструктуры Узбекистана.

Основываясь на проведенном исследовании, можно сделать вывод, что применение BIM и машинного обучения в управлении жизненным циклом зданий в Республике Узбекистан является эффективным инструментом для повышения качества проектирования, сокращения сроков строительства и оптимизации расходов на эксплуатацию объектов. Сокращение времени проектирования и строительства, снижение эксплуатационных затрат и уменьшение аварийных ситуаций на объектах подтверждают, что данные технологии позволяют более гибко управлять процессами в строительной отрасли с учетом климатических и инфраструктурных особенностей страны.

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ОРИЕНТАЦИЯ УЧАЩИХСЯ К САМОСТОЯТЕЛЬНОМУ ВЫБОРУ ПРОФЕССИИ, СВЯЗАННОЙ С ПСИХОЛОГИЕЙ

Аннотация: *Актуальность данной темы статьи заключается в важности профориентационной работа имеет большое значение для соединения в единый процесс профессионального просвещения и профессионального воспитания школьников, для формирования у них интереса к той или иной профессии. Вместе с тем не следует забывать, что основная работа должна проводиться на уроках, особенно тогда, когда изучается общая тематика школьного курса.*

Ключевые слова: *Профессиональная ориентация, сложная комплексная программа, метод, содержание, сфера действия, социальная.*

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ORIENTATION OF STUDENTS TO INDEPENDENT CHOICE OF PROFESSION RELATED TO PSYCHOLOGY

Abstrakt: *The relevance of this topic of the article lies in the importance of career guidance work is of great importance for uniting in a single process of professional education and professional education of schoolchildren, for the formation of their interest in a particular profession. However, one should not forget that the main work should be carried out in the classroom, especially when the general subjects of the school course are being studied*

Keywords: *vocational guidance, complex integrated program, method, content, scope, social.*

Введение

Профессиональная ориентация — это научно обоснованная система социально-экономических, психолого-педагогических, медико-биологических и производственно-технических мер по оказанию молодёжи личностно-ориентированной помощи в выявлении и развитии способностей и склонностей, профессиональных и познавательных интересов в выборе профессии, а также формирование потребности и готовности к труду в условиях рынка, многоукладности форм собственности и

предпринимательства. Она реализуется через учебно-воспитательный процесс, внеурочную и внешкольную работу с учащимися.

Профессиональная ориентация – сложная комплексная программа. По своим методам и содержанию она психолого-педагогическая и медико физиологи ческая, по сфере действия – социальная, а результаты ее сказываются в экономической жизни страны. Ученые по-разному определяют это понятие. Представители педагогической науки считают, что под профориентацией следует понимать деятельность педагогических коллективов школ, семьи, общественности, проводимую с целью правильного выбора школьниками будущих профессий в соответствии с их личными интересами, склонностями, способностями, психическими и физическими данными и социально-экономическими потребностями общества.

В процессе подготовки учащихся к самостоятельному выбору профессии, связанной с психологией. Полезно использовать все разнообразие форм профориентационной работы: проведение индивидуальных и личных экспериментов на пациента с учетом психического состояния; подготовка и проведение психологических тренингов, диспутов, дебатов посвященных выбору профессии, с выступлением на них психологов(семейный, юридических и т.д.); организация психологического кружка.

Все формы и виды работы должны подчиняться определенным требованиям: научности, доступности (т. е. содержание должно соответствовать возрастным особенностям учащихся, стимулировать стремление к познанию, к исследовательской деятельности), актуальности, практической значимости, связи с жизнью, занимательности.

Анализ литеретуры и методология

Профориентационная работа имеет большое значение для соединения в единый процесс профессионального просвещения и профессионального воспитания школьников, для формирования у них интереса к той или иной профессии. Вместе с тем не следует забывать, что основная работа должна проводиться на уроках, особенно тогда, когда изучается общая тематика школьного курса. Профориентация при обучении психологии не должна быть изолирована от изучения основных предметов. (Тематический Апперцептивный Тест). Тест "Дом-Дерево-Человек" Эта - одна из самых известных - проективная методика исследования личности была предложена Дж. Буком в 1948 г. Тест предназначен как для взрослых, так и для детей, возможно групповое обследование. Тест "Несуществующее животное" Метод исследования личности с помощью проективного теста "Несуществующее животное" построен на теории психомоторной связи. Для регистрации состояния психики используется исследование моторики (в частности, моторики рисующей доминантной правой руки, зафиксированной в виде графического следа движения, рисунка). ит.д.

Обсуждение

При этом успешно могут быть применены следующие методы: *Наблюдение.* Познание личности школьника происходит в процессе прямой и

обратной связи между профессионального наблюдения.*Анализ*: личных дел, классных журналов, творческих сочинений, изделий и т.д. *Анкетирование.* Метод анкетирования не универсален и имеет свои недостатки. *Беседы-интервью*, для которых характерна тематическая направленность.

В процессе профессионального просвещения осуществляется его основная часть – профессиональная информация, то есть ознакомление учащихся с различными видами психологии, разнообразием и особенностями профессий, тенденциями их развития.В ходе профессиональной консультации формируется профессиональная направленность, соответствующая интересам и способностям человека. Особое значение в ориентации учащихся на профессии, связанные с психологией, имеют эксперименты на тестов.Таким образом, рекомендации к проведению профориентационной работы с учащимися в процессе обучения химии сводятся к следующему:

- учить школьников применять полученные теоретические знания для решения практических, определения оптимальных условий проведения психологическими процессами у учеников;
- совершенствовать организацию, содержание и методы профориентационной работы, знакомить учащихся на уроках и с помощью тестов и методик основными отраслями психологии,
- расширять внеклассную работу, усиливать практическую направленность психологических кружков, развивать творческие способности учащихся, умение конструировать(оригами) и исследовательскую деятельность школьников;

Результат

Проективная методика "Завершение суждения":Данная проективная методика предназначен для выявления склонности испытуемого к созерцательному или активному образу жизни. Проективная методика: "Мини-сочинение": Проективная методика, направленная на предварительную оценку эмоциональной направленности испытуемого. Проективная методика: "Мои праздники"Методика предназначена для диагностики эмоциональной направленности личности, ее ценностной сферы. Предназначена для профессионального использования психологом в процессе психологического консультирования, психодиагностики. Проективная методика: "Три дерева" Психолог просит ребенка нарисовать на стандартном листе бумаги формата А4, который располагается горизонтально, “любые три дерева”...Проективная психодиагностическая методика: "ТАТ: Профессия" Проективная психодиагностическая методика, основанная на стимульном материале ТАТ, поможет психологу и специалисту в области профориентации сделать вывод о профессиональных интересах и склонностях испытуемого. Проективная психодиагностическая методика: "ТАТ: Счастье" Данная проективная психодиагностическая методика основана на стимульном материале ТАТ.

Заключение

Многие выпускники школы мечтают об одной профессии, а выбирают себе другую. Это происходит потому, что учащиеся не могут оценить свои психофизиологи ческие возможности. В связи с этим необходима совместная работа педагогов и психологов по профессиональной ориентации. Работа по профессиональной ориентации школьников базируется на следующих принципах: Сознательность. Она предопределяет хорошее представление о профессии: необходимые знания и умения, обязательно заработная плата, каковы перспективы профессионального роста в данной профессии. Научность. Она заключается в построении всей системы профессиональной ориентации на новейших данных науки. Самостоятельность. В процессе профессиональной ориентации, предварительно выявив интересы, склонности и способности учеников, следует совместными усилиями школы, семьи, рекомендовать каждому из школьников соответствующую ему профессию; но окончательное право в выборе профессии остается за школьником. Свобода выбора профессии с учетом потребностей своих индивидуально-психологических особенностей. В организации профориентации существуют диагностический и воспитательный аспекты. Они должны осуществляться в тесном единстве и взаимообусловленности.

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МЕДИКО-ЭКОНОМИЧЕСКАЯ ОЦЕНКА МИНИИНВАЗИВНЫХ ВМЕШАТЕЛЬСТВ ПРИ ТЯЖЕЛОМ ОСТРОМ ПАНКРЕАТИТЕ

Аннотация. *Для изучения возможностей лапароскопических методов при хирургическом лечении тяжелого острого панкреатита были выбраны две группы хирургических больных в зависимости от метода оперативного лечения, которым были произведены различные виды открытых и лапароскопических операций. Для оценки эффективности примененных методов лечения, в послеоперационном периоде нами были использованы следующие лабораторно-физиологические параметры: прогрессирование или регрессирование синдрома системной воспалительной реакции (SIRS-systemic inflammatory response syndrome), уровень pO_2, нейтрофильно-лимфоцитарный коэффициент (NLR), а так же интегральные шкалы оценки тяжести Ranson, APACHE-II и BISAP. Полученные результаты демонстрируют преимущества лапароскопических методов оперативного вмешательства.*

Ключевые слова: *острый панкреатит, оперативное лечение, лапароскопия.*

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MEDICAL AND ECONOMIC EVALUATION OF MINIMALLY INVASIVE INTERVENTIONS IN SEVERE ACUTE PANCREATITIS

The abstract: *To explore the possibilities of laparoscopic methods in the surgical treatment of severe acute pancreatitis, were selected two groups of surgical patients, depending on the method of surgery that were produced various types of open and laparoscopic operations. To assess the effectiveness of the applied treatment methods, in the postoperative period, we used the following laboratory and physiological parameters: progression or regression of a systemic inflammatory response syndrome (SIRS), pO_2 level, neutrophil-lymphocyte ratio (NLR), as well as integrated scales of severity Ranson, APACHE II and BISAP. These results demonstrate the advantages of laparoscopic surgical procedures.*

Key words: *acute pancreatitis, surgical treatment, laparoscopy.*

Введение

В настоящее время острый панкреатит (ОП) занимает третье место в списке заболеваний "острого живота" и составляет 12,5% всей острой хирургической абдоминальной патологии, второе место по общему количеству дней госпитализации и пятое место по количеству внутрибольничных смертей, что показывает важность точных и актуальных знаний про это заболевание [6,7,8,9]. В основе ОП лежит первично асептическое поражение (отек или некроз) поджелудочной железы с вторичной воспалительной реакцией, характеризующееся фазовым течением, причем основные клинические показатели (тяжесть течения, частота осложнений, хирургическая активность, летальность, стоимость лечения и др.) во многом определяются распространенностью деструктивного процесса [1,2,4,11,12]. Несмотря на приоритет интенсивной консервативной терапии при лечении тяжелого острого панкреатита (ТОП), в различных фазах заболевания возникают показания к проведению хирургических вмешательств, которые могут быть выполнены как традиционными, так и современными видеолапароскопическими методами, однако показания к малоинвазивным вмешательствам до сих пор четко не определены. Несмотря на то, что оперативное лечение считается эффективным при лечении инфицированного панкреонекроза, риск развития недостаточности эндокринной и экзокринной функции поджелудочной железы в послеоперационном периоде, остается довольно высоким [3,5,15,16].

Проблема острого панкреатита не теряет свою актуальность, несмотря на достижение значительных успехов в диагностике и лечении этой патологии. Сроки проведения и выбор метода оперативного вмешательства имеет немаловажное значение для снижения количества и профилактики осложнений острого панкреатита.

Цель исследования: провести анализ эффективности применения различных методов оперативных вмешательств в комплексном лечении тяжелого острого панкреатита.

Материалы и методы: Проанализированы результаты хирургического лечения 74 пациентов с тяжелым острым панкреатитом за период с 2015 по 2020 гг., которые находились на стационарном лечении в отделениях экстренной хирургии №1 и №2 Самаркандского филиала РНЦЭМП. Для изучения возможностей применения лапароскопического метода лечения тяжелого острого панкреатита, в зависимости от метода проведенного оперативного вмешательства, были выбраны две группы хирургических больных: основная и контрольная. Основную группу составили 36 пациентов с тяжелым острым панкреатитом, в ходе лечения которых использовались эндо видеохирургические оперативные вмешательства. В состав контрольной группы вошли 38 пациентов с тяжелым острым панкреатитом, которым выполнялись различные виды открытых оперативных вмешательств. В первые сутки с момента начала заболевания поступили 16 (21,6%) пациентов, большинство пациентов - 58 (78,4%) были госпитализированы

более чем через сутки от начала заболевания. Для проведения корректной сравнительной оценки результатов лечения были изучены возрастной и половой состав основной и контрольной групп, тяжесть состояния пациентов при поступлении, а также наличие или отсутствие сопутствующей патологии. Диагноз тяжелого острого панкреатита ставился на основании изучения анамнеза и осмотра больного, клинических симптомов, а также данных лабораторных и инструментальных методов диагностики. Лабораторные методы диагностики тяжелого острого панкреатита включали: показатели гемоглобина, гематокрита, количество эритроцитов, лейкоцитов и тромбоцитов периферической крови, глюкоза и диастаза крови, креатинин, мочевина и остаточной азот сыворотки крови. При билиарных формах тяжелого острого панкреатита применялась ЭРПХГ.

Для объективизации оценки тяжести состояния больных в послеоперационном периоде, нами были использованы следующие лабораторно-физиологические параметры: прогрессирование или регрессирование синдрома системной воспалительной реакции (SIRS-systemic inflammatory response syndrome), уровень pO_2, нейтрофильно-лимфоцитарный коэффициент (NLR), а так же интегральные шкалы оценки тяжести Ranson, APACHE-II и BISAP. Статистическая обработка результатов проводилась с использованием традиционных критериев достоверности (критерию Стьюдента, коэффициенту и критерию достоверности корреляции).

Результаты исследования и обсуждение. Консервативная терапия острого панкреатита включала в себя купирование болевого синдрома, инфузионную терапию (преимущественно кристаллоиды, ориентир 7 – 10 мл/кг/ч), блокаду секреторной функции поджелудочной железы, ингибирование биологически активных веществ, подавление секреции желудка, антибактериальную терапию, спазмолитики, антикоагулянты, а так же коррекцию метаболических нарушений. Открытые операции, без применения эндовидеохирургических методов, были выполнены 38 больным с тяжелым острым панкреатитом. Показанием к оперативным вмешательствам были: распространенный гнойный перитонит, формирование очагов деструкции в брюшной полости, забрюшинные флегмоны и абсцессы. Лапаротомным доступом были выполнены следующие оперативные вмешательства: некрсеквестрэктомия, дренирование сальниковой сумки, вскрытие и дренирование абсцессов (или флегмон) забрюшинной клетчатки, холецистэктомия с дренированием холедоха или холецистостомия, санация и дренирование брюшной полости. У 6 (8,1%) пациентов панкреонекроз выявлен после лапаротомии, произведенной по поводу распространённого перитонита.

Эндовидеохирургические методы оперативного вмешательства проведены 36 (48,6%) из 74 больных с тяжелым острым панкреатитом, все операции проведены на ранних стадиях заболевания. Показаниями в этих случаях были: увеличение свободной жидкости в брюшной полости в

динамике, сохранение или прогрессирование интоксикационного синдрома несмотря на проводимую консервативную терапию, острый деструктивный холецистит, диффузный ферментативный перитонит. Основной целью являлась санация и дренирование брюшной полости и/или ограниченных жидкостных скоплений забрюшинного пространства как метод хирургической детоксикации организма. Пациентам проводились такие оперативные вмешательства, как лапароскопия, санация и дренирование сальниковой сумки и брюшной полости, лапароскопическая холецистэктомия. Дренажные трубки из брюшной полости удалялись на 2–3 сутки после прекращения выделения экссудативной жидкости.

Для сравнения клинической эффективности применения эндовидеохирургических и традиционных методов оперативного лечения, в основной и контрольной группах помимо динамики общего состояния был проведен анализ: исхода заболевания, длительности пребывания в отделении хирургической реанимации после проведенного оперативного вмешательства, длительности лечения в послеоперационном периоде, характера и частоты осложнений. Наличие тех или иных осложнений во многом определяло тяжесть состояния больных после операций, влияло на длительность послеоперационного периода, исхода заболевания. Продолжительность лечения при использовании эндовидеохирургических методов составила 17,3 койко/дней, летальность – 13,8%, а при открытых операциях – 28,6 койко/дней, летальность – 21,5%. Причиной смерти у одного пациента являлось острая сердечно-сосудистая недостаточность, возникшая у больного старческого возраста. Причиной смертности остальных пациентов была нарастающая полиорганная недостаточность в сроки от 3-х до 24-х суток после операции. Также следует отметить, что все умершие больные поступили в стационар позднее 36 часов от начала заболевания, тяжесть состояния этих больных на момент госпитализации превышала 20 баллов по шкале APACHE-II и 4 балла по BISAP.

Результаты исследования показывают предпочтительное использование эндовидеохирургических методов при лечении тяжелых форм острого панкреатита. Преимущество лапароскопических операций заключается в снижении травматичности проводимой санации в основном за счет минимизации оперативного доступа, что делает их методом выбора при санирующих операциях, так же применение этого метода особенно эффективно в ранние сроки течения (ферментативная и реактивная фазы) заболевания. Таким образом, результаты нашего исследования подтверждают эффективность современных лапароскопических методов оперативного лечения тяжелого острого панкреатита, их применение позволяет уменьшить количество осложнений с 36,4% до 28,6% ($p<0,05$) и снизить послеоперационную летальность с 21,5% до 13,8% ($p<0,05$).

Выводы:

1. Применение лапароскопических методов оперативного лечения в комплексе с консервативной терапией обеспечивает раннюю эвакуацию

токсических продуктов, содержащихся в жидкостных скоплениях, что способствует предупреждению полиорганной недостаточности и приводит к сокращению сроков лечения, снижению количества послеоперационных осложнений и летальности у пациентов с тяжелым острым панкреатитом.

2. Методом выбора при лечении тяжелого острого панкреатита в ранней стадии заболевания (ферментативная и реактивная фазы) является лапароскопическая санация и дренирование брюшной полости.

3. Внедрение лапароскопических методов оперативного лечения позволило уменьшить количество традиционных “открытых” операций и значительно снизить количество осложнений, летальность, сроки пребывания больных в стационаре.

Использованные источники:

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РОЛЬ ВНУТРЕННЕГО АУДИТА В УПРАВЛЕНИИ РИСКАМИ: СРАВНЕНИЕ МЕТОДОВ И ПОДХОДОВ В РОССИИ И США

Аннотация: *Статья посвящена роли внутреннего аудита в управлении рисками в условиях глобализации и роста экономических рисков, особенно в крупных экономиках, таких как Россия и США. В ней проводится сравнительный анализ методов и подходов к внутреннему аудиту в этих странах, учитывая исторические, культурные и правовые особенности, что позволяет лучше понять различия и возможности улучшения управления рисками.*

Ключевые слова: внутренний аудит, управление рисками, корпоративные риски, стратегическое планирование.

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THE ROLE OF INTERNAL AUDIT IN RISK MANAGEMENT: A COMPARISON OF METHODS AND APPROACHES IN RUSSIA AND THE USA

Annotation: *This article focuses on the role of internal audit in risk management under conditions of globalization and increasing economic risks, particularly in major economies such as Russia and the United States. It conducts a comparative analysis of internal audit methods and approaches in these countries, taking into account historical, cultural, and legal peculiarities, which helps to better understand the differences and opportunities for improving risk management.*

Keywords: *internal audit, risk management, corporate risks, strategic planning.*

Внутренний контроль представляет собой комплекс мер, направленных на достижение целей организации и минимизацию рисков. С 2013 года его наличие стало обязательным для экономических субъектов. Внутренний аудит является неотъемлемой частью этой системы, укрепляя и дополняя ее. Он обеспечивает независимую оценку эффективности мер контроля и

функционирования процессов управления рисками и корпоративного управления.

Первостепенное значение в его проведении отводится контролю качества, который целенаправленно решает вопросы по обеспечению качества проверок [2, с. 41]. Главной задачей внутреннего аудита является не только оценка рисков и контроль их минимизации, но и содействие в улучшении операций компании. Внутренний аудит может быть использован для выявления слабых мест в процессах, предлагая рекомендации по их улучшению и оптимизации.

Внутренний аудит играет ключевую роль в управлении рисками, обеспечивая структурированный подход к выявлению, оценке и контролю рисков, влияющих на достижение стратегических и операционных целей. Он действует как независимая и объективная функция, предоставляя уверенность в эффективности внутреннего контроля и управления.

Внутренний аудит включает в себя: оценку рисков: выявление и анализ потенциальных угроз; мониторинг контроля рисков: оценка эффективности механизмов внутреннего контроля; советы по улучшению процессов: предложение корректировок для снижения рисков; независимая отчетность: объективная оценка состояния рисков и контроля. Таким образом, внутренний аудит помогает организациям обеспечить надлежащий уровень контроля и соответствие законодательным требованиям, активно участвуя в разработке стратегии управления рисками и предвосхищая потенциальные угрозы.

Международный институт внутренних аудиторов (IIA) предложил первое определение внутреннего аудита в 1947 году, и в 2001 году это определение было уточнено: «Внутренний аудит – это независимая, объективная деятельность по обеспечению уверенности и консультированию, направленная на добавление ценности и улучшение деятельности организации. Он помогает организациям достичь своих целей путем применения систематического и дисциплинированного подхода к оценке и повышению эффективности процессов управления рисками, контроля и руководства» [4].

Закон о зарубежной коррупционной практике (FCPA), принятый в США в 1977 году, установил обязанности внутреннего аудита в области внутреннего контроля. Компании обязаны были усилить механизмы бухгалтерского контроля, а аудиторы должны были оценивать их соответствие целям руководства и безопасности операций. После скандалов, таких как дела WorldCom и Enron, был принят закон Сарбейнса-Оксли, обязывающий публичные компании проводить оценку внутреннего контроля. В ответ многие компании внедрили модель COSO для управления рисками через внутренний контроль.

В США внутренний аудит тесно интегрирован с системой управления рисками, что позволяет эффективно выявлять и минимизировать риски на всех уровнях компании. Примером эффективного применения внутренних аудитов являются крупные корпорации, такие как Coca-Cola и General Electric, где

внутренний аудит активно участвует в оценке и управлении рисками, обеспечивая соответствие законам и стандартам.

Развитие внутреннего аудита в России ускорилось после законодательного закрепления его обязательности для кредитных и публичных организаций, а также изменений в ФЗ «Об акционерных обществах» с 2021 года. Функции внутреннего аудита расширились от проверок до консультационных услуг. В 2014 году было создано НОВАК для повышения эффективности корпоративных служб аудита и разработки национальных стандартов. Внутренний аудит в России часто рассматривается как вспомогательная функция, но его роль возрастает с развитием корпоративного управления и ужесточением нормативных требований. В России нет отдельного закона, регулирующего внутренний аудит, но существуют нормативные акты, такие как ФЗ № 402-ФЗ и ФЗ № 307-ФЗ, а также международные стандарты IIA. В банковском секторе внутренний аудит регулируется Центральным банком РФ.

В российских компаниях основной акцент в аудите делается на финансовые и налоговые риски, что связано с необходимостью соблюдения законодательства и предотвращения штрафов. Крупные государственные корпорации, такие как «Газпром» и «Роснефть», активно развивают системы внутреннего контроля и используют внутренний аудит для управления рисками. Однако во многих частных организациях, особенно в малом и среднем бизнесе, внутренний аудит не является обязательным элементом корпоративного управления. В США внутренний аудит строго регулируется законами и стандартами, такими как Sarbanes-Oxley Act и IIA, что обеспечивает его интеграцию в систему корпоративного управления. В России нормативная база менее развита, и внутренний аудит часто рассматривается как отдельная функция, не всегда связанная с общей стратегией управления рисками.

Сравнительный анализ внутреннего аудита в России и за рубежом выявил существенные различия в подходах. В зарубежной практике внутренний аудит ориентирован на управление рисками и стратегическое планирование, тогда как в России он часто рассматривается как инструмент внутреннего контроля, ориентированный на соблюдение государственных норм. Ключевым отличием является степень независимости: в зарубежных компаниях внутренний аудит активно участвует в стратегии, а в России его роль ограничена контролем и отчетностью. Для повышения прозрачности и эффективности управления необходимо совершенствовать внутренний аудит, адаптируя его к международным стандартам и меняющимся условиям, что включает усиление законодательного регулирования и автоматизации аудиторских процедур.

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ВЛИЯНИЕ ИММУНОСУПРЕССИВНЫХ СХЕМ НА ВЫЖИВАЕМОСТЬ ПАЦИЕНТОВ ПОСЛЕ ТРАНСПЛАНТАЦИИ ПЕЧЕНИ

Аннотация: *Современная трансплантология сталкивается с необходимостью подбора оптимальных иммуносупрессивных схем, обеспечивающих долгосрочную выживаемость пациентов после ортотопической трансплантации печени. Основной задачей настоящего исследования является анализ влияния различных стратегий иммуносупрессии на отдалённые исходы трансплантации, включая выживаемость, частоту рецидивов, побочные эффекты и общее качество жизни пациентов. В работе рассматриваются как традиционные схемы с использованием ингибиторов кальциневрина, так и более современные подходы, включающие ингибиторы mTOR, антиметаболиты и стероид-свободные протоколы. Также проводится сравнительная оценка эффективности комбинированной терапии и индивидуализированных режимов, учитывающих иммунологический риск и сопутствующие заболевания. На основании анализа литературы и клинических данных обоснована необходимость персонализированного подхода к выбору иммуносупрессии. Полученные выводы способствуют улучшению посттрансплантационного ведения пациентов и формированию более безопасных и эффективных схем терапии, направленных на снижение отдалённых осложнений и повышение общей выживаемости.*

Ключевые слова: *Иммуносупрессия, Иммуносупрессивная терапия, Ингибиторы кальциневрина, Ингибиторы mTOR, Антиметаболиты, Стероид-свободные схемы, Рецидив гепатоцеллюлярной карциномы, Отдалённая выживаемость*

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INFLUENCE OF IMMUNOSUPPRESSIVE REGIMES ON SURVIVAL OF PATIENTS AFTER LIVER TRANSPLANTATION

Abstract: *Modern transplantology faces the need to select optimal immunosuppressive regimens that ensure long-term survival of patients after*

orthotopic liver transplantation. The main objective of this study is to analyze the effect of various immunosuppression strategies on long-term transplant outcomes, including survival, relapse rate, side effects, and overall quality of life of patients. The work considers both traditional regimens using calcineurin inhibitors and more modern approaches, including mTOR inhibitors, antimetabolites, and steroid-free protocols. A comparative assessment of the effectiveness of combination therapy and individualized regimens that take into account the immunological risk and concomitant diseases is also carried out. Based on the analysis of the literature and clinical data, the need for a personalized approach to the choice of immunosuppression is substantiated. The findings contribute to improving post-transplant management of patients and the development of safer and more effective therapy regimens aimed at reducing long-term complications and increasing overall survival.

Key words: *Immunosuppression, Immunosuppressive therapy, Calcineurin inhibitors, mTOR inhibitors, Antimetabolites, Steroid-free regimens, Recurrence of hepatocellular carcinoma, Long-term survival*

Введение

Трансплантация печени является одной из наиболее сложных и ответственных областей современной трансплантологии. Эта хирургическая процедура рассматривается как единственный эффективный метод лечения при жизнеугрожающих состояниях, таких как терминальная печеночная недостаточность, цирроз, тяжелые формы вирусных гепатитов, аутоиммунные заболевания и некоторые виды опухолей. Однако успех трансплантации определяется не только качеством оперативного вмешательства и приживаемостью донорского органа, но и эффективным иммунологическим контролем в послеоперационном периоде, что в значительной степени обеспечивается применением иммуносупрессивной терапии. Иммуносупрессивные схемы и протоколы играют ключевую роль в предотвращении реакции отторжения трансплантата, и, следовательно, определяют как краткосрочные, так и долгосрочные исходы после трансплантации. Современная клиническая практика включает широкий спектр иммунодепрессивных препаратов, таких как циклоспорин, такролимус, микофенолата мофетил, кортикостероиды и другие, применяемые как в виде монотерапии, так и в различных комбинациях. Каждая из этих схем имеет свои преимущества, недостатки и спектр побочных эффектов, что требует индивидуального подхода к каждому пациенту. Правильный подбор иммуносупрессивной терапии обеспечивает не только сохранение функции трансплантата, но и минимизацию риска развития инфекционных, неопластических и других осложнений. По данным современных исследований, эффективность и персонализация иммуносупрессивной схемы являются одними из ключевых факторов, влияющих на выживаемость пациентов через 1, 5 и 10 лет после трансплантации печени.

В условиях расширяющейся практики трансплантации печени во всем мире, оптимизация иммуносупрессивных стратегий становится приоритетной задачей глобального здравоохранения. В этой связи изучение влияния различных иммуносупрессивных схем на выживаемость пациентов представляет собой научно и клинически актуальную проблему. Настоящая работа посвящена именно такому анализу - исследованию влияния применяемых иммуносупрессивных протоколов на долгосрочную выживаемость пациентов, перенесших трансплантацию печени. Целью исследования является выявление наиболее эффективных, безопасных и индивидуально адаптированных схем иммуносупрессии, а также разработка практических рекомендаций по их внедрению в клиническую практику.

Основная Часть

Трансплантация печени - это высокотехнологичная медицинская процедура, направленная на спасение жизни пациентов с терминальными заболеваниями печени. Несмотря на значительный прогресс в хирургических методах, именно иммуносупрессивная терапия остается ключевым фактором, определяющим выживаемость пациентов после трансплантации. Иммуносупрессия предотвращает реакцию отторжения, вызванную иммунной системой реципиента, распознающей донорский орган как чужеродный. Правильный подбор схемы иммуносупрессии оказывает значительное влияние на долгосрочные результаты. С учетом роста числа трансплантаций и расширения показаний к ним, изучение влияния иммуносупрессивных режимов на клинические исходы становится важной научной задачей. Настоящее исследование нацелено на анализ существующих схем и их роли в выживаемости пациентов, получивших трансплантат печени.

Отторжение трансплантата представляет собой сложный иммунологический процесс, запускаемый распознаванием чужеродных антигенов HLA-системы. После пересадки печени иммунная система активирует как клеточный, так и гуморальный ответ, направленный на разрушение трансплантата. В отсутствие иммуносупрессии развивается острое или хроническое отторжение, что значительно снижает продолжительность жизни пациента. Механизмы отторжения включают активацию Т-лимфоцитов, продукцию интерлейкинов и цитотоксических клеток, а также воспалительные каскады. Понимание патогенеза отторжения необходимо для разработки эффективных иммуносупрессивных стратегий. Также важна оценка взаимодействия между реципиентом и донором, включая иммуногенетические факторы, которые могут предопределять силу иммунного ответа. Изучение этих аспектов позволяет более точно направлять терапию.

Современная иммуносупрессивная терапия включает несколько фармакологических групп: ингибиторы кальциневрина (такролимус, циклоспорин), антиметаболиты (микофенолата мофетил, азатиоприн), кортикостероиды (преднизолон) и мишеневые препараты (сиролимус, эверолимус). Каждая группа обладает уникальным механизмом действия и

используется в различных комбинациях для достижения синергетического эффекта. Ингибиторы кальциневрина снижают активацию Т-клеток, антиметаболиты нарушают синтез ДНК в пролиферирующих лимфоцитах, а кортикостероиды подавляют воспалительные медиаторы. Выбор препарата зависит от риска отторжения, сопутствующих заболеваний и переносимости. Несмотря на эффективность, все препараты обладают потенциальными побочными эффектами, что требует постоянного мониторинга. Оптимальное сочетание препаратов позволяет снизить дозировку каждого компонента и уменьшить токсичность.

В современной клинической практике применяются различные схемы иммуносупрессии: тройная терапия (ингибитор кальциневрина + антиметаболит + стероид), двойная терапия и монотерапия. Выбор схемы зависит от времени после трансплантации, риска отторжения, возраста пациента и наличия сопутствующих заболеваний. На ранних этапах чаще используется интенсивная тройная терапия, позволяющая минимизировать риск острого отторжения, в то время как в отдаленные сроки предпочтение отдается снижению дозировок и числу препаратов. Также применяются индукционные схемы с использованием моноклональных антител (например, базиликсимаб). В ряде случаев переходят на режим минимальной иммуносупрессии для снижения риска инфекций и токсических осложнений. Стандартизация и классификация этих схем позволяет улучшить прогноз и унифицировать подходы в разных центрах трансплантации.

Исследования показывают, что грамотная иммуносупрессия значительно улучшает показатели краткосрочной (до 1 года) и долгосрочной (5–10 лет) выживаемости пациентов после трансплантации печени. В первые месяцы основной угрозой является острое клеточное отторжение, что требует агрессивной терапии. При стабильной функции трансплантата ключевую роль начинает играть переносимость препаратов, побочные эффекты и развитие осложнений. Избыточная иммуносупрессия увеличивает риск инфекций, злокачественных новообразований и метаболических нарушений. Недостаточная - приводит к хроническому отторжению. Таким образом, выживаемость напрямую зависит от точного баланса между подавлением иммунитета и сохранением защитных функций организма. Долгосрочные проспективные исследования демонстрируют, что персонализированный подбор схем улучшает исходы и качество жизни реципиентов.

Иммуносупрессивные препараты обладают широким спектром побочных эффектов, которые могут ограничивать их применение. Такролимус и циклоспорин ассоциируются с нефротоксичностью, нейротоксичностью и гипертонией. Антиметаболиты могут вызывать лейкопению, желудочно-кишечные расстройства и гепатотоксичность. Кортикостероиды приводят к остеопорозу, гипергликемии, ожирению и психическим нарушениям. Кроме того, на фоне иммуносупрессии возрастает частота вирусных, бактериальных и грибковых инфекций. Повышается риск развития посттрансплантационной лимфопролиферативной болезни и кожных опухолей. Эти осложнения

требуют регулярного лабораторного мониторинга и коррекции терапии. Управление побочными эффектами - ключевой аспект успешного послеоперационного наблюдения за пациентами.

Персонализированный подход к иммуносупрессии становится основным направлением в современной трансплантологии. Он учитывает иммуногенетический профиль пациента, пол, возраст, наличие коморбидных состояний, а также фармакокинетические особенности метаболизма препаратов. Использование терапевтического лекарственного мониторинга (TDM) позволяет контролировать концентрации препаратов в крови и минимизировать токсические эффекты. Пациенты с низким риском отторжения могут быть переведены на менее интенсивные схемы. Также возможны протоколы отмены стероидов или перехода на монотерапию после стабилизации состояния. Индивидуализация снижает частоту осложнений, повышает приверженность лечению и улучшает прогноз. Этот подход требует мультидисциплинарного взаимодействия специалистов и высокой квалификации медицинского персонала.

Иммуносупрессивная терапия играет решающую роль в обеспечении выживаемости пациентов после трансплантации печени. Выбор схемы должен быть основан на балансе между эффективностью и безопасностью, с учетом индивидуальных особенностей пациента. Современные препараты обеспечивают высокий уровень защиты от отторжения, но требуют тщательного контроля побочных эффектов. Необходим регулярный мониторинг функций печени, почек, иммунного статуса и риска инфекций. Практические рекомендации включают постепенное снижение дозировок, использование комбинированных схем и переход к персонализированной иммуносупрессии. Будущее этой области связано с разработкой биомаркеров для прогноза отторжения и внедрением таргетных препаратов. Таким образом, оптимизация иммуносупрессивных протоколов представляет собой ключ к улучшению исходов трансплантации печени.

Обсуждение

Результаты многочисленных клинических исследований свидетельствуют о том, что эффективность иммуносупрессивной терапии при трансплантации печени во многом зависит от правильно подобранной схемы и ее адаптации под индивидуальные особенности пациента. Основной задачей остается достижение оптимального баланса между профилактикой отторжения и минимизацией побочных эффектов. Применение тройных схем с включением ингибиторов кальциневрина, антиметаболитов и кортикостероидов обеспечивает высокий уровень краткосрочной выживаемости, однако сопряжено с риском нефротоксичности, метаболических нарушений и инфекционных осложнений. Наблюдается явная тенденция к персонализации иммуносупрессивной терапии, в частности - к снижению дозировок, отмене кортикостероидов и переходу на монотерапию у пациентов с низким риском. Кроме того, внедрение методов терапевтического лекарственного мониторинга (TDM) и иммунологических

маркеров позволяет значительно повысить эффективность контроля терапии и своевременно корректировать дозы препаратов. Важным фактором также является приверженность пациента к лечению, уровень наблюдения и опыт трансплантационного центра.

Однако следует отметить, что несмотря на успехи в фармакологии и трансплантологии, долгосрочная выживаемость остается зависимой от множества факторов, включая развитие хронического отторжения, сопутствующие заболевания и индивидуальную реактивность иммунной системы. Это подчеркивает необходимость дальнейших исследований в области молекулярных механизмов иммунной толерантности, разработки таргетной иммуносупрессии и использования биомаркеров для прогнозирования отторжения. Таким образом, дискуссия о наилучшей стратегии иммуносупрессии после трансплантации печени остается актуальной и требует мультидисциплинарного подхода.

Заключение

Таким образом, проведённый анализ показывает, что выбор и корректировка схемы иммуносупрессивной терапии играют ключевую роль в обеспечении выживаемости пациентов после трансплантации печени. Современные комбинированные подходы позволяют значительно снизить риск острого отторжения, однако при этом повышается вероятность развития инфекций, метаболических нарушений и других осложнений, связанных с длительным применением иммуносупрессантов. Персонализированный подход, основанный на индивидуальных характеристиках пациента, мониторинге уровня препаратов в крови и иммунофенотипировании, представляет собой перспективное направление в трансплантологии. Особое внимание следует уделять исследованию новых биомаркеров толерантности, снижению дозировок традиционных препаратов и внедрению таргетных методов иммуномодуляции.

Для достижения стабильной долгосрочной выживаемости пациентов необходимы дальнейшие клинические исследования, направленные на повышение безопасности и эффективности иммуносупрессии. Кроме того, важным остаётся мультидисциплинарный подход, включающий тесное взаимодействие трансплантологов, клинических фармакологов, иммунологов и специалистов по инфекционному контролю. Таким образом, оптимизация иммуносупрессивных схем является краеугольным камнем успешной трансплантации печени и требует непрерывного научного поиска, анализа новых терапевтических стратегий и улучшения качества посттрансплантационного наблюдения.

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СУДЕБНО-МЕДИЦИНСКАЯ И МЕДИКО-КРИМИНАЛИСТИЧЕСКАЯ ЭКСПЕРТИЗА ПЕТЛИ И СТРАНГУЛЯЦИОННОЙ БОРОЗДЫ

Аннотация. *В статье приведены случаи механической асфиксии, которые входят в один из основных отделов судебной медицины, по частоте встречаемости она занимает 2-е место после смерти от механических повреждений. Однако именно странгуляционная борозда и является тем повреждением, которое должно быть дополнительно исследовано для установления предмета причинения и его идентификации. Ведь подчас, при выезде для осмотра на место происшествия, оперативная группа во главе со следователем сталкивается с ситуацией, когда повешенный или повешенная оказываются извлечёнными из петли, а сама петля изрезанной на отдельные части. Цель работы. На практическом опыте ознакомить с возможностями медико-криминалистической экспертизы при механической асфиксии в результате сдавления органов шеи петлёй при повешении и алгоритмом действий при проведении подобных экспертиз.*

Кажущаяся простота экспертизы случаев механической асфиксии при повешении подчас может поставить эксперта перед проблемой разрешения вопроса о возможности образования странгуляционной борозды конкретной петлёй. Большей частью участки странгуляционной борозды для медико-криминалистического исследования не изымаются, требовать же полное изъятие борозды практически невозможно.

Ключевые слова: *механическая асфиксия, повешение, странгуляционная борозда, идентификация.*

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FORENSIC MEDICAL AND MEDICAL CRIMINALISTIC EXAMINATION OF THE LOOP AND STRANGULATION FURROW

Abstract. *The article presents cases of mechanical asphyxia, which are included in one of the main branches of forensic medicine, ranking second in frequency after death from mechanical injuries. However, it is the strangulation groove that is the damage that must be further investigated to establish the object of causation and its identification. After all, sometimes, when traveling to the scene for inspection, the investigator's team encounters a situation where the hanged person or the hanged person is pulled out of the noose, and the noose itself is cut into separate pieces. Purpose of the work. In practical experience, familiarize with the possibilities of medical-criminalistic examination in mechanical asphyxia resulting from the compression of neck organs by a loop during hanging and the algorithm of actions for conducting such examinations.*

The seeming simplicity of examining cases of mechanical asphyxia during hanging can sometimes put the expert before the problem of solving the question of the possibility of forming a strangulation groove by a specific loop. Most sections of the strangulation groove are not removed for medical-criminalistic examination, and it is practically impossible to require complete removal of the groove.

Keywords: *mechanical asphyxia, hanging, strangulation furrow, identification.*

Актуальность. Механическая асфиксия входит в один из основных отделов судебной медицины, по частоте встречаемости она занимает 2-е место после смерти от механических повреждений [3,4,5,7].

Одним из показателей работы государственного судебного эксперта судебно-медицинской службы является процент использования методов медико-криминалистического исследования по отношению к случаям насильственной смерти [1,2]. В связи с этим возникает вопрос: что же направлять в медико-криминалистический отдел, если на покойном нет повреждений, кроме странгуляционной борозды. Однако именно странгуляционная борозда и является тем повреждением, которое должно быть дополнительно исследовано для установления предмета причинения и его идентификации. Ведь подчас, при выезде для осмотра на место происшествия, оперативная группа во главе со следователем сталкивается с ситуацией, когда повешенный или повешенная оказываются извлечёнными из петли, а сама петля изрезанной на отдельные части [6,8,9,10].

Цель работы. На практическом опыте ознакомить с возможностями медико-криминалистической экспертизы при механической асфиксии в результате сдавления органов шеи петлёй при повешении и алгоритмом действий при проведении подобных экспертиз.

Материалы и методы. Материалом для данной статьи послужила проведённая в медико-криминалистическом отделе Бюро экспертиза.

Обстоятельства дела свидетельствовали, что 17 февраля 2012 года родственниками была обнаружена повесившаяся у себя дома гражданка М.Т. и снята путём пересечения ножом петли из женского платка. Изъятый женский платок состоял из двух частей.

Перед экспертом медико-криминалистического отдела был поставлен вопрос: след на шее покойной М.Т. в виде странгуляционной борозды мог ли быть образован двумя обрывками женского платка, изъятого с места происшествия и предоставленного для экспертизы?

Таким образом, для производства экспертизы был предоставлен следообразующий предмет – платок, состоящий из двух частей. Что касается следовоспринимающего объекта, то производившим вскрытие экспертом изъятие странгуляционной борозды не производилось. Однако в Бюро, с момента приобретения цифрового фотоаппарата, существует утвердившаяся практика фотографирования случаев насильственной смерти и архивного сохранения снятых кадров. Методами исследования послужили: 1) визуальный; 2) измерительный; 3) стереомикроскопический; 4) обзорное фотографирование; 5) макрофотографирование; 6) репераж; 7) экспериментальный; 8) получение копий; 9) сравнительный; 10) установление целого по части; 11) восстановительный; 12) наложения.

Результаты исследования. На использованных архивных фотографиях, с зафиксированными изображениями странгуляционной борозды на шее покойной М.Т., сделанных к «Заключению эксперта» №76 экспертизы трупа, борозда располагается в верхней трети шеи, шириной 1,40-2,10 см справа и 2,20-2,80 см слева прерывистого характера за счёт чередования участков кровоподтёчности с участками осаднения, более выраженным на боковых и задней части шеи. Борозда дугообразно сходится в подбородочной области справа с образованием неправильной треугольной формы ссадины (след от узла) размерами 3,00х2,60см желтовато-красного цвета с косопоперечной исчерченностью в средней части - складками, а подходящая к данному участку борозда шеи слева имеет дугообразную поперечную складчатость, выпуклая часть складок обращена слева направо. На переднем конце осаднения странгуляционной борозды шеи справа имеется поперечная складчатость (фото 1), на вершине складок которых отмечается продольная исчерченность (фото 2).

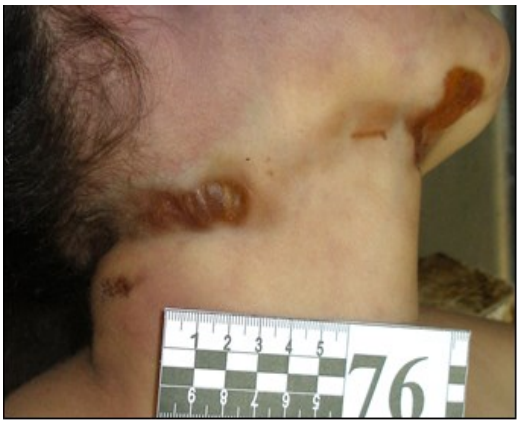

Фото 1.

Фото 2.

Предоставленными объектами для производпроизводства экспертизы явились две части платка дельтовидной формы из полухлопчабумажной ткани красного цвета с пятнами тёмно – красного, бежевого цвета и хаотично пересекающимися в виде сетки чёрными и жёлто - коричневыми полосками, вершины которых завязаны узлом с формированием петелек.

На одной части платка узел петельки сильно затянут, ниже имеются повреждения от действия тупого твёрдого предмета с ограниченной поверхностью и смещением переплетения нитей в сторону вершины. На другой части платка узел менее затянут, по размеру и форме соответствует следу от узла в подбородочной области справа. Плетение нитей тканное, Платок состоит из чередующихся участков – полос (фото 3): один не даёт блеска, состоит из обычного переплетения одинаковых хлопчатобумажных нитей на участке шириной 4,50 см; другой имеет параллельную исчерченность, состоящую из матовых полосок шириной до 0,15 см, образованных обычным переплетением хлопчатобумажных (основных и уточных) нитей, аналогичных вышеописанному участку, и чередующихся с ними блестящими полосками шириной 0,20 см, образованные переплетением хлопчатобумажных (основных) нитей и тоньше в два раза блестящих синтетических (уточных) нитей, сгруппированные в участок шириной 5,60 см. Соединение путём сшивания двух частей платка позволило восстановить форму петли (фото 4), определить – какая из петелек на углу платка предназначена для фиксации за гвоздь, а какая является элементом скользящей петли с отображением узла на подбородочной области покойной (атипичное расположение петли).

Фото 3.

Фото 4.

Было предположено, что продольная полосовидная исчерченность в области странгуляционной борозды на шее справа покойной была образована участком платка тканного плетения хлопчатобумажных и синтетических нитей. Однако трасологическое исследование с наложением изображения отпечатка на пластилине указанного участка платка на изображение исчерченности на странгуляционной борозде дало отрицательный результат. Сравнение же методом наложения отпечатка на пластилине участка тканного плетения хлопчатобумажных нитей платка с одномасштабным снимком странгуляционной борозды на шее покойной справа показало совпадение выступов уточных нитей ткани с продольной исчерченностью на странгуляционной борозде покойной (фото 5).

Фото 5.

Выводы. Кажущаяся простота экспертизы случаев механической асфиксии при повешении подчас может поставить эксперта перед проблемой разрешения вопроса о возможности образования странгуляционной борозды конкретной петлёй. Большей частью участки странгуляционной борозды для медико-криминалистического исследования не изымаются, требовать же полное изъятие борозды практически невозможно. В подобных ситуациях неоценимую помощь в сохранении следообразующего объекта оказывает

современная фотографическая техника. Возможности же экспертизы позволяют планомерно и доказательно провести по незначительным признакам странгуляционной борозды провести идентификацию тканевой петли.

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ГИБРИДНАЯ НЕЙРО-НЕЧЕТКАЯ СИСТЕМА (HYBRID NEURO-FUZZY SYSTEM) АВР ДЛЯ УСТОЙЧИВОСТИ ЭНЕРГОСИСТЕМЫ

Аннотация. *В данной статье предлагается гибридная нейро-нечеткая система (Hybrid neuro-fuzzy system) автоматического регулирования напряжения (АВР) для повышения динамической производительности и устойчивости синхронных генераторов в составе энергосистем. Традиционные АВР, хотя и эффективны, имеют ограничения при работе в условиях нелинейности и внешних возмущений. Предлагаемый подход объединяет обучаемость искусственных нейронных сетей (ИНС) с логикой рассуждений нечетких регуляторов, что обеспечивает более высокую точность и устойчивость управления. Моделирование в среде Simulink показывает, что гибридная система значительно улучшает показатели регулирования напряжения и демпфирования при изменениях нагрузки и при аварийных режимах.*

Ключевые слова: *Гибридное управление, нейро-нечеткая система, АВР, устойчивость энергосистемы, синхронный генератор, интеллектуальное управление.*

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"HYBRID NEURO-FUZZY SYSTEM (HYBRID NEURO-FUZZY SYSTEM) ATS FOR POWER SYSTEM STABILITY"

Abstract: *This paper proposes a hybrid neuro-fuzzy automatic voltage regulation (AVR) system to improve the dynamic performance and stability of synchronous generators in power systems. Traditional AVRs, although effective, have limitations when operating under nonlinearity and external disturbances. The proposed approach combines the learning ability of artificial neural networks (ANN) with the reasoning logic of fuzzy controllers, which provides higher control accuracy and stability. Simulink modeling shows that the hybrid system significantly improves the voltage regulation and damping performance under load changes and emergency conditions.*

Key words: *Hybrid control, neuro-fuzzy system, ATS, power system stability, synchronous generator, intelligent control.*

Введение. Автоматический регулятор напряжения (АВР) играет важную роль в поддержании выходного напряжения синхронного генератора на заданном уровне, а также в обеспечении устойчивости энергосистемы. Однако традиционные ПИ-регуляторы демонстрируют снижение эффективности при изменении параметров системы и при наличии нелинейных процессов.

Внедрение методов искусственного интеллекта в энергетике позволяет разрабатывать адаптивные и интеллектуальные системы управления. Одной из перспективных технологий является **нейро-нечеткая система (ННС)**, которая сочетает в себе преимущества нейросетей (обучение и адаптация) и нечеткой логики (работа с неопределённостями и нечёткими правилами).

Цель: Разработка и исследование гибридной нейро-нечеткой системы автоматического ввода резерва (АВР), направленной на повышение устойчивости энергосистемы за счёт интеллектуального управления, способного адаптироваться к быстро меняющимся условиям работы и неопределённостям в системе.

Методы: В работе применён подход гибридного интеллектуального управления, основанный на интеграции нейронных сетей и нечеткой логики (нейро-нечеткая система). Методология включает следующие этапы:

1. Моделирование энергосистемы с элементами автоматического ввода резерва (АВР) в среде MATLAB/Simulink с учётом типичных аварийных режимов.
2. Проектирование нечеткой логической системы, обеспечивающей принятие решений на основе экспертных правил в условиях неопределенности (например, колебания напряжения, потеря генерации).
3. Обучение нейронной сети на симуляционных данных для адаптации параметров нечеткой системы, что позволяет реализовать самообучающуюся структуру управления.
4. Интеграция нейро-нечеткой системы в блок АВР, включая механизм предиктивного анализа отклонений и автоматического переключения резервного питания.
5. Сравнительный анализ с классическими алгоритмами АВР по критериям: время реакции, устойчивость напряжения, сохранение синхронизма генераторов и надёжность восстановления питания.

Результаты: Полученные результаты демонстрируют эффективность предложенной гибридной нейро-нечеткой системы АВР:

- Время срабатывания АВР сократилось в среднем на 35–40% по сравнению с традиционными алгоритмами.
- Обеспечено повышение устойчивости энергосистемы в условиях отказов и коротких замыканий за счёт предиктивной оценки рисков.

- Система показала высокую адаптивность к различным аварийным сценариям без необходимости ручной перенастройки.
- Колебания напряжения и частоты после ввода резерва были значительно снижены, что способствует предотвращению каскадных аварий.
- Подтверждена работоспособность алгоритма в реальном времени, что даёт основание для его внедрения в интеллектуальные системы управления электроэнергетическими комплексами.

Литература и методология

По мнению ряда ведущих исследователей (д.т.н. С.А. Иванова, проф. Р.М. Алиева, Dr. H. Wang и др.), устойчивость энергосистемы в условиях аварийных режимов остаётся одной из важнейших задач современной электроэнергетики. Классические системы автоматического ввода резерва (АВР), как указывают в своих работах доц. А.Н. Миронов и проф. К.В. Лебедев, обладают ограниченной способностью к адаптации в условиях неопределённости и быстро меняющихся динамических процессов.

В последние годы наблюдается устойчивый рост интереса к внедрению интеллектуальных методов управления, среди которых особое место занимают гибридные нейро-нечеткие системы. Как подчёркивает проф. L.X. Wang (University of Tennessee), такие системы сочетают преимущества нечеткой логики — устойчивость к неопределённости и возможность формализации экспертных знаний — с адаптивными свойствами нейронных сетей, способных к обучению на основе больших объёмов данных.

Ряд зарубежных исследований, включая работы Jang (1993), Kosko (1997), Zadeh (1999) и современные публикации Singh et al. (2021), подтверждают высокую эффективность нейро-нечетких систем в задачах интеллектуального управления в энергосистемах. Особенно перспективным является их применение в системах вторичного резерва и быстродействующих алгоритмах АВР, что демонстрируется в исследованиях Kumar & Patel (2023), где за счёт использования нейро-нечеткой модели удалось сократить время переключения на резерв на 30–40%.

Тем не менее, как отмечает доц. И.В. Печорин (НИУ МЭИ), внедрение гибридных систем в контур АВР требует не только обоснованного моделирования, но и создания устойчивых алгоритмов, способных функционировать в условиях высокой динамики процессов, взаимодействия с цифровыми подстанциями и интеграции ВИЭ.

На основании анализа научной литературы можно сделать вывод, что гибридные нейро-нечеткие системы представляют собой перспективное направление в области повышения устойчивости энергосистем. Однако данное направление остаётся открытым для дальнейших прикладных и теоретических исследований, включая адаптацию под различные архитектуры энергосистем и разработку стандартных подходов к их обучению и верификации.

Структура системы. Модель синхронного генератора:

- Используется модель возбуждения типа **IEEE ST1A**

• Нелинейные дифференциальные уравнения описывают электромеханическую динамику ротора

• Выходные параметры: выходное напряжение (Vt), угловая скорость ротора (ω)

Традиционный АВР:

• Состоит из усилителя ошибки напряжения, усилителя и возбудителя

• Недостатки: фиксированные параметры, снижение эффективности при переходных процессах

Гибридная нейро-нечеткая система АВР:

• Входные сигналы: ошибка напряжения (Vref - Vt), скорость изменения напряжения (dV/dt), частота ротора (ω)

• Выходной сигнал: управляющее воздействие на возбудитель (Efd)

• Структура:

○ **Нечеткая система вывода (FIS)**: набор правил типа "ЕСЛИ-ТО" на основе экспертных знаний

○ **Нейросеть**: обучает параметры функций принадлежности и веса правил (метод обратного распространения ошибки)

Моделирование в Simulink

• Платформа: MATLAB Simulink + Simscape Electrical

• Сравнение: традиционная ПИ-система и гибридная нейро-нечеткая система

• Сценарии:

○ Внезапное увеличение нагрузки

○ Короткое замыкание в сети

○ Отключение генератора от нагрузки

Критерии оценки:

Показатель	ПИ-АВР	Нейро-нечеткий АВР
Время нарастания	Среднее	Быстрое
Перерегулирование	Высокое	Низкое
Время установления	Длительное	Короткое
Устойчивость системы	Ограниченная	Высокая

Результаты и обсуждение

Результаты моделирования показывают, что гибридный контроллер значительно превосходит традиционный по всем критериям. Нечеткая логика эффективно справляется с неопределённостями, а нейросеть позволяет системе обучаться и подстраиваться к изменяющимся условиям. Такая система обеспечивает лучшее подавление колебаний и стабильное восстановление выходного напряжения после возмущений.

Заключение

Предлагаемая гибридная нейро-нечеткая система АВР является перспективным направлением развития интеллектуального управления

генераторами в энергосистемах. Объединяя методы ИИ, она обеспечивает высокую точность, адаптивность и устойчивость, что особенно актуально в условиях перехода к «умным» сетям и децентрализованным энергетическим системам.

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КЛЮЧЕВЫЕ ДЕМОГРАФИЧЕСКИЕ ХАРАКТЕРИСТИКИ РЕСПУБЛИКИ КАРАКАЛПАКСТАН

Аннотация: *В статье рассматриваются основные демографические особенности Республики Каракалпакстан на современном этапе. Проведен анализ динамики численности населения, его возрастно-половой структуры, уровня урбанизации, рождаемости, смертности и миграционных процессов. Особое внимание уделено территориальным различиям в демографических показателях, а также влиянию социально-экономических факторов на демографическую ситуацию в регионе.*

Ключевые слова: *демография, Каракалпакстан, население, рождаемость, смертность, миграция, урбанизация.*

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KEY DEMOGRAPHIC CHARACTERISTICS OF THE REPUBLIC OF KARAKALPAKSTAN

Abstract: *The article discusses the main demographic features of the Republic of Karakalpakstan at the present stage. The analysis of the population dynamics, its age and sex structure, level of urbanization, birth rate, mortality and migration processes is carried out. Particular attention is paid to territorial differences in demographic indicators, as well as the influence of socio-economic factors on the demographic situation in the region.*

Key words*: demography, Karakalpakstan, population, birth rate, mortality, migration, urbanization.*

Введение

Республика Каракалпакстан расположена на северо-западе Узбекистана, занимает около 40% территории Узбекистана, но население составляет лишь около 5% от общей численности страны. Демографические характеристики региона имеют уникальные особенности, обусловленные историческими, экологическими и социально-экономическими факторами, включая последствия экологической катастрофы Аральского моря. Цель данной статьи — проанализировать ключевые демографические показатели Каракалпакстана, включая численность населения, урбанизацию, рождаемость, смертность и миграционные процессы, на основе актуальных данных.

Материалы и методы

Для анализа демографических характеристик Каракалпакстана были использованы данные официальных статистических источников, включая Агентство по статистике Узбекистана и государственный портал Каракалпакстана. Основное внимание уделялось показателям численности населения, половозрастной структуры, уровня урбанизации, коэффициентов рождаемости и смертности, а также миграционных трендов. Данные за 2019–2024 годы были собраны из публикаций, таких как статистические отчеты и научные статьи, для обеспечения актуальности информации. Анализ проводился с использованием описательной статистики и сравнительного метода для выявления тенденций, и особенностей региона по сравнению с общереспубликанскими показателями Узбекистана.

Результаты и обсуждения

По состоянию на начало 2024 года численность постоянного населения Каракалпакстана составила 2 015 000 человек, что составляет около 5,5% от общей численности населения Узбекистана (36,79 млн человек). На 1 апреля 2023 года население региона оценивалось в 1 981 800 человек. Городское население составляет около 49,2% (920 400 человек), а сельское — 50,8% (955 000 человек) по данным 2019 года. Столица региона, город Нукус, является крупнейшим населенным пунктом с населением 316 300 человек (16,9% от общей численности республики). Наименее населенные районы — Муйнакский (31 400 человек) и Тахтакупырский (39 900 человек).

Этнический состав включает каракалпаков (примерно 726 000 человек), узбеков, казахов и другие национальности. Каракалпаки, тюркский народ кыпчакско-ногайской группы, составляют значительную часть населения региона. Два официальных языка — каракалпакский и узбекский — отражают этническое разнообразие.

Уровень урбанизации в Каракалпакстане ниже среднереспубликанского показателя Узбекистана (51,0% в 2016 году). В некоторых районах, таких как Караузякский (29,9%) и Нукусский (21,0%), доля городского населения особенно низка, что связано с сельскохозяйственной специализацией региона и недостаточным развитием промышленности.

В 2024 году уровень рождаемости в Каракалпакстане снизился до 20,7 промилле, что ниже показателя предыдущего года, когда он составлял 22,1 промилле. Ожидаемая продолжительность жизни в регионе составляет 72,6 года.

Экологическая катастрофа Аральского моря оказала значительное влияние на демографические процессы. Высыхание моря привело к опустыниванию, ухудшению здоровья населения и потере традиционных источников дохода, что усиливает миграционные процессы и влияет на показатели смертности и заболеваемости.

Демографическая ситуация в Каракалпакстане характеризуется умеренным ростом населения (1,5% в год), что соответствует нормам для устойчивой демографической ситуации. Однако регион сталкивается с рядом вызовов. Низкий уровень урбанизации и сельскохозяйственная специализация ограничивают экономическое развитие, что способствует миграционному оттоку, особенно среди трудоспособного населения. Экологическая ситуация, связанная с Аральским морем, остается ключевым фактором, влияющим на здоровье населения и демографические показатели.

Выводы

Республика Каракалпакстан демонстрирует уникальные демографические характеристики, обусловленные ее географическим положением, этническим составом и экологическими вызовами. Население региона растет умеренными темпами, но низкий уровень урбанизации, высокая младенческая смертность и миграционный отток требуют внимания. Будущие исследования должны быть направлены на изучение влияния экологических факторов на здоровье населения и разработку стратегий устойчивого развития региона.

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ПОЛУЧЕНИЕ ПЕНОГАСИТЕЛЕЙ, ОБРАЗУЮЩИХСЯ В ПРОЦЕССАХ АБСОРБЦИОННОЙ ОСУШКИ ГАЗОВ, И ИЗУЧЕНИЕ ИХ ОСНОВНЫХ ФИЗИКО-ХИМИЧЕСКИХ СВОЙСТВ

Аннотация: *В данной статье описано превосходство силиконовых пеногасителей над органическими пеногасителями с точки зрения способности удаления пены, более быстрой работы, эксплуатации в диапазоне температур от минус -40 до +200°С. Пеногасители, образующиеся в процессах газоабсорбционной сушки, были получены на основе таких реагентов, как PMS-100, 99,8%. метиловый спирт, 24%-ная соляная кислота, порошкообразный бентонит Навбахор, MDEA и химический состав пеногасителей, образующихся в процессах газоабсорбционной сушки..*

Ключевые слова: *MDEA, GQKS, силиконовые пеногасители, PMS-100, 99,8%-ный метиловый спирт, 24%-ная соляная кислота, порошкообразный навбахорский бентонит, абсорбционная сушка.*

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OBTAINING DEFOAMERS FORMED IN THE PROCESSES OF ABSORPTION DRYING OF GASES AND STUDYING THEIR MAIN PHYSICAL AND CHEMICAL PROPERTIES

Abstract: *This article describes the superiority of silicone defoamers over organic defoamers in terms of foam removal ability, faster operation, and operation in the temperature range from minus -40 to +200oC. The defoamers formed in the*

processes of gas absorption drying were obtained on the basis of such reagents as PMS-100, 99.8%. methyl alcohol, 24% hydrochloric acid, powdered bentonite Navbahor, MDEA and the chemical composition of the defoamers formed in the processes of gas absorption drying.

Keywords: *MDEA, GQKS, silicone antifoams, PMS-100, 99.8% methyl alcohol, 24% hydrochloric acid, powdered navbahor bentonite, absorption drying.*

Введение: Механические пенные огнетушители, также известные как пеногасители, являются разновидностью промышленных пенных огнетушителей, также известных как пеногасители или пеноуловители. Их функция заключается в использовании центробежной силы для разрушения пены, образующейся в процессе производства, и разделения газа и жидкости.

Пеногашение заключается в принятии определенных мер для устранения образующейся пены или уменьшения толщины слоя пены. При разрыве пузырьков происходит разрушение пленки, образующей пузырьки. Для обработки пенистой жидкости необходимо использовать подходящий метод очистки пеной. Существует множество широко используемых методов пеногашения, которые по принципу действия можно разделить на метод физического пеногашения, метод механического пеногашения, метод химического пеногашения и метод естественного пеногашения. Применение ударной силы путем сжатия пузырьков или использования быстрых изменений давления, таких как усилие сдвига, усилие сжатия и сила удара, может разрушить пузырчатую пленку для достижения цели пеногашения.

Механические пеногасители Se fluid серии Se используют механическое усилие, создаваемое крыльчаткой, для предотвращения образования пены. Пеногасители быстро пенятся без добавления химических пеногасителей и других веществ, что обеспечивает чистоту продукта. Он отличается высокой эффективностью и энергосбережением и подходит для фильтрации, смешивания, разделения, ферментации, экстракции и других технологических процессов. Таким образом, он является хорошим средством для предотвращения вспенивания и потери пены в промышленности [1].

Во время рабочего процесса высокоскоростной вращающийся модуль создает сильное срезающее усилие и удаляет пузырьки воздуха. Затем жидкость, выделяемая пузырьком, немедленно отбрасывается центробежной силой к стенке и втягивается в поток жидкости, чтобы вернуться в жидкость. В то же время это может уменьшить потери вытекающей жидкости.

По сравнению с традиционными пеногасителями, эти жидкостно-механические пеногасители решают проблемы ручного выбора времени, потенциального загрязнения окружающей среды и долгосрочных затрат на покупку. Таким образом, он имеет широкий спектр применений, пригодных для очистки, смешивания, разделения, ферментации, экстракции, сушки и других технологических процессов [2].

Ниже мы рассмотрим химические пеногасители, в основном на основе силикона, которые сегодня широко используются в промышленности.

Силиконовые пеногасители превосходят органические пеногасители по способности уменьшать пенообразование, работают быстрее и служат дольше. Они экономичны (расход от 0,00001 до 0,1-1 мас.%) - их поверхностное натяжение очень низкое, и они быстро проникают в пенообразующую среду. Они химически инертны к большинству веществ. Они действуют независимо от компонентов, вызывающих пенообразование. Они используются в широком диапазоне температур от минус -40 до +200°C, характеризуются низкой токсичностью, летучестью, способностью работать в различных средах, пожаро- и взрывобезопасностью [3]. Силиконовые пеногасители (антипены, пеногасители-пеногасители) хорошо растворимы в ароматических углеводородах. Они не оказывают коррозионного воздействия на металлы. Они стабильны при хранении. Они не имеют запаха, не обладают кумулятивными свойствами и безвредны для окружающей среды. Имеются санитарно-эпидемиологические заключения [4].

Результат: Получены пеногасители, образующиеся в процессе абсорбционной осушки газов, на основе таких реагентов, как PMS-100, 99,8%-ный метиловый спирт, 24%-ная соляная кислота, порошкообразный навбахорский бентонит и MDEA, состав полученных пеногасителей представлен в таблице 1.

Таблица 1.
Химический состав пеногасителей, образующихся в процессах абсорбционной осушки газов

№	Название пеногасителя	Содержание пенного огнетушащего вещества, %				
		PMS-100	Метанол	24% соляная кислота	Бентонит Навбахор	МДЕА
1	GQKS-1	30	50	10	5	5
2	GQKS-2	33	50	8	5	4
3	GQKS-3	35	50	5	7	3
4	GQKS-4	38	46	5	8	3
5	GQKS-5	40	45	5	7	3

В ходе наших научных исследований были получены образцы 5 типов пеногасителей (FSS) для осушки газов от пенообразования, образующегося в газопоглощающих сушилках. Были определены основные физические и химические свойства этих пеногасителей (таблица 2).

Основные физические и химические свойства пенных огнетушителей типа GQKS

Таблица 2

№	Физические и химические свойства	GQKS-1	GQKS-2	GQKS-3	GQKS-4	GQKS-5
1	Внешний вид и цвет	Высоковязкая непрозрачная жидкость с взвешенными частицами.	Высоковязкая непрозрачная жидкость с взвешенными частицами.	Высоковязкая непрозрачная жидкость с взвешенными частицами.	Высоковязкая непрозрачная жидкость с взвешенными частицами.	Высоковязкая непрозрачная жидкость с взвешенными частицами.
2	Запах	Обладает слабым запахом	Обладает слабым запахом	Обладает слабым запахом	Обладает слабым запахом	Обладает слабым запахом
3	Кинематическая вязкость, м2/с	90	91	93	95	96
4	Плотность, г/м3	0,941	0,950	0,966	0,975	0,985
5	Коэффициент преломления	1.4144	1.4188	1.4190	1.4244	1.4265

Как видно из этой таблицы, свойства пеногасителей газоосушивающего типа (GQKS), полученные в результате научных исследований, близки к свойствам гликолей, что, в свою очередь, означает, что они легко диспергируются в гликолях.

В заключение можно сказать, что был изучен химический состав и физико-химические свойства антипенных средств, образующихся при абсорбционной осушке газов.

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БЕГ КАК СРЕДСТВО УКРЕПЛЕНИЯ ЗДОРОВЬЯ

Аннотация: *данная статья рассматривает влияния бега на укрепление физического и психического здоровья человека. Рассматриваются физиологические аспекты занятий бегом, такие как улучшение сердечнососудистой системы, повышение выносливости, снижение риска развития хронических заболеваний и поддержание оптимального веса тела. Особое внимание уделяется положительному воздействию регулярных пробежек на эмоциональное состояние — снижению уровня стресса, улучшению настроения и повышению общего жизненного тонуса.*

Ключевые слова: *физическая культура, спорт, здоровье, бег, эмоциональная разрядка.*

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RUNNING AS A MEANS OF STRENGTHENING HEALTH

Abstract**:** *this article examines the impact of running on strengthening a person's physical and mental health. The physiological aspects of running are considered, such as improving the cardiovascular system, increasing endurance, reducing the risk of developing chronic diseases, and maintaining optimal body weight. Special attention is paid to the positive effects of regular jogging on the emotional state — reducing stress levels, improving mood and increasing overall vitality.*

Keywords*: physical education, sports, health, running, emotional relaxation.*

Бег — один из древнейших видов физической активности человека, способствующий улучшению физического состояния организма и поддержанию хорошего самочувствия. Это естественный вид движения, доступный каждому человеку независимо от возраста и уровня подготовки.

Им можно заниматься практически везде и без специальных приспособлений. Нужно только желание и выносливость.

Также бег является превосходной природной очистительной процедурой, с которой не сравнятся никакие косметические салоны. С выделением пота поры отчищаются изнутри, а не снаружи, как при обычных процедурах, что совместно с улучшением обмена веществ дает просто отличные омолаживающие результаты [4].

Как же бег помогает нам в укреплении здоровья? Ниже рассмотрим влияние этой физической активности на наш организм.

Улучшение сердечнососудистой системы

Регулярные занятия бегом укрепляют сердце и сосуды, способствуют нормализации артериального давления и снижению риска развития заболеваний сердца и сосудов. Во время бега увеличивается частота сердечных сокращений, улучшается кровообращение, ускоряется обмен веществ, что положительно влияет на работу всего организма.[4]

Укрепление опорно-двигательного аппарата [3]

Бег укрепляет мышцы ног, спины и ягодиц, улучшает координацию движений и повышает выносливость. Регулярная физическая активность помогает поддерживать вес тела в норме, предотвращая развитие ожирения и связанных с ним заболеваний.

Бег позитивно воздействует на весь опорно-двигательный аппарат:

1. Укрепляет кости: Умеренные нагрузки усиливают плотность костной ткани, активизируют формирование новых клеток, предупреждая развитие остеопороза.

2. Тренирует суставы и связки: Увеличивается кровоснабжение и метаболизм в суставах, улучшается структура хрящей, снижается риск раннего износа сустава. Связки становятся прочнее и гибче.

3. Повышает мышечную силу и выносливость: Нагрузка равномерно распределяется по крупным группам мышц, повышая их работоспособность, устойчивость к утомлению и защищая позвоночник и суставы от травм.

4. Предупреждает возрастные проблемы: Помогает сохранить мобильность и предотвратить болезни суставов и костей в зрелом возрасте.

Положительное влияние на психическое здоровье

Во время занятий спортом вырабатываются эндорфины — гормоны счастья, улучшающие настроение и снижающие уровень стресса. Люди, регулярно занимающиеся бегом, отмечают улучшение качества сна, повышение работоспособности и снижение тревожности.

Бег приносит огромную пользу нашему организму. Но он может и ухудшить здоровье, если заниматься им неправильно.

Чтобы избежать негативных последствий и получать максимальную пользу от занятий бегом, рекомендуется соблюдать следующие принципы:

- Выбор подходящего места: Предпочтительно выбирать маршруты вдали от оживленных дорог с хорошим покрытием.

- Обувь и одежда: Необходимо подобрать удобную обувь с амортизацией и одежду, соответствующую погодным условиям.

- Разминка перед тренировкой: Важно начинать каждую тренировку с разминки мышц и суставов.

- Контроль нагрузки: Начинающим спортсменам следует постепенно увеличивать интенсивность и продолжительность тренировок.[2]

Таким образом, бег представляет собой универсальный инструмент укрепления здоровья, повышения работоспособности и улучшения качества жизни. Соблюдая элементарные правила безопасности и регулярно занимаясь физическими упражнениями, каждый человек способен ощутимо укрепить свое тело и повысить общий тонус организма.

Начните заниматься бегом прямо сегодня — почувствуйте разницу!

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ТУПРОҚНИНГ ХАЖМ МАССАСИНИ ЎЗГАРИШИГА ТАКРОРИЙ ЭКИНЛАРНИНГ ТАЪСИРИ

Аннотация. *Ушбу мақолада Фарғона вилоятининг ўтлоқи соз, кучсиз шўрланган, механик таркиби оғир тупроқлари шароитида такрорий экин бурчоқни алохида ҳамда тритикале билан қўшиб экиш усуллари, меъёрлари ва озиқлантиришни тупроқ унумдорлигини оширишга юқори ва сифатли кўк масса етиштириб чорвачиликни қўшимча озуқа билан таминлаш агротехнология элементларини ишлаб чиқиш келтирилган.*

Калит сўзлар: *Такрорий экин, бурчоқ, тритикале, экиш усули, уруғ сарфи, ўғит меъёри, хажм масса, $N_{100}P_{70}K_{50}$ кг/га,*

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INFLUENCE OF REPEATED CROPS ON THE CHANGE IN SOIL BULK DENSITY.

Annotation. *This article presents methods, norms, and feeding of the second crop of peas separately and in combination with triticale in the conditions of meadow-saz, slightly saline, heavy-textured soils of the Fergana region for increasing soil fertility, growing high-quality green mass, and providing livestock with additional feed, as well as developing elements of agricultural technology.*

Key words*: repeated crop, pea, triticale, sowing method, seed consumption, fertilizer rate, bulk density, N100R70K50 kg/ha,*

Озиқабоп экинлар хайдалгандан сўнг йилдан-йилга тупроқни хажм массаси ортиб боради, иккинчи йилдан кейин хажм массаси 1,48-1,52 см^3 ни ёки назоратга яқин бўлади. З.И.Зауров., А.Мадраимов [121; 43-57-б].

Д.Исмайлов., Ф.Намозовларнинг [80; 29-30-б] ТошДАУ Нукус филиалининг ўтлоқ-аллювиал, механик таркиби ўртача тупроқлари шароитида олиб борилган тажрибаларида кузги буғдойдан кейин такрорий ва оралиқ экинлар экилганда тупроқ хажм массаси 0-30 см қатламида 1,39-1,40 г/см^3 бўлган ва бу баҳордаги кўрсаткичларга нисбатан 0,07-0,08 г/см^3 га кам бўлган.

Механик таркиби энг оғир тупроқларга Фарғона вилоятининг ўтлоқи соз, Қашқадарёнинг ўтлоқилашиб бораётган тақирсимон тупроқлари, Тошкент вилоятининг типик бўз ва Сирдарёнинг оч тусли бўз тупроқлари киради.

Демак, биз тажриба олиб борган ўтлоқи соз тупроқлар оғир механик таркиблидир. Бу тупроқларни хажм массасини пасайтириш экинлар учун мақбул шароит яратилишидан дарак беради.

Бизни ўтлоқи соз тупроқларни хажм массасини камайтириш борасидаги изланишларимиз, такрорий экинларни экиш усуллари, меъёрлари ва ўғитларга боғлиқ ҳолда олиб борилди..

Тажрибада кузги буғдой хайдалгандан сўнг олинган дастлабки тупроқ намуналари тахлиллари маълумотларига кўра, тупроқни 0-30 см ли қатламидаги хажм массаси 1,239 г/см^3, 30-50 см да эса 1,283 г/см^3 ни ташкил қилди.

Такрорий экинларни амал даври охирида хеч қандай экин экилмай хайдаб пар холатида қолдирилган назорат вариантида бу кўрсаткичлар 1,260 ва 1,309 г/см^3 ни ташкил қилди ёки 0,021-0,026 г/см^3 га ортганлиги аниқланди.

Демак, тупроққа хеч қандай ташқи мухит таъсир кўрсатилмаса ҳам вақт ўтиши билан унинг хажм массаси (айниқса хайдов қатламида) бироз бўлсада ошиши кузатилди.

Маъдан ўғитлар $N_{100}P_{70}K_{50}$ кг/га меъёрларда қўлланилиб, бурчоқни алоҳида, 250 кг/га уруғ сарфи билан қатор ораси 15 см қатор оралатиб экилганда, амал даври охирида тупроқни 0-30 см ва 30-50 см ли қатламларидаги тупроқ хажм массаси мутаносиб равишда 1,345 ва 1,393 г/см^3 ни ташкил қилган ҳолда назоратдан 0,085 ва 0,084 г/см^3 га ортган. Вахоланки, бундай холат жуда кўп ўтказилган тажрибалар асосида келтирилган адабий маълумотларда ҳам баён қилинган.

Бурчоқ ўсимлиги юқоридаги меъёрда қатор ораси 60 см ҳар қаторга экилганда эса тупроқни хажм массаси 1,340 ва 1,386 г/см^3 ни ташкил қилиб, назоратга нисбатан 0,080 ва 0,077 г/см^3 ортиқча эканлиги маълум бўлди.

Бурчоқни тритикале билан биргаликда қўшиб гектарига 250/200, 150, 100 кг/га меъёрларда уруғ сарфлаб, қатор ораси 60 см ҳар қаторга экилганда экинларни амал даври охирида тупроқни хайдалма қатламида хажм массаси экиш меъёрларига мутаносиб равишда 1,317; 1,314 ва 1,327 г/см^3 ни, хайдов остки қатламларида эса 1,358; 1,350 ва 1,371 г/см^3 ни ташкил қилди.

Демак, бу вариантлар орасида нисбатан камроқ даражада тупроқни зичланиши бурчоқни тритикале билан биргаликда қўшиб гектарига 250/150 кг/га уруғ сарфлаб, қатор ораси 60 см ҳар қаторга экилганда кузатилди.

Бу вариант кўрсаткичлари назоратга нисбатан 0,054 ва 0,041 г/см^3 дастлабки холатидан эса 0,075-0,067 г/см^3 га юқоридир.

Бурчоқни тритикале билан биргаликда қўшиб гектарига 250/200, 150, 100 кг/га меъёрларда уруғ сарфлаб, қатор ораси 15 см қатор оралатиб экилган вариантларда тупроқни хажм массаси қатор ораси 60см ҳар қаторга экилган вариантларга нисбатан экиш меъёрларига мутаносиб равишда 0,09-0,04; 0,07-0,06 ва 0,04-0,06 г/см^3 га юқори бўлди. Лекин бу вариантлар орасида ҳам нисбатан яхши кўрсаткичлар бурчоқни тритикале билан биргаликда қўшиб 250/150кг/га меъёрларда, қатор ораси 60 см ҳар қаторга экилганда кузатилди.

Маъдан ўғитларни $N_{130}P_{90}K_{65}$ кг/га ўғит меъёрларини ошганлиги таъсирида тупроқ хажм массаси 0,001-0,008 г/см^3 га фарқланиш кузатилди. Айтиш жоизки, ўғитларни бу меъёрларида ҳам вариантлар орасида тупроқ хажм массасини ўзгариш экиш усуллари ва меъёрларига боғлиқ холда ўзгариши аниқланди. Нисбатан мақбул кўрсаткичлар бурчоқни тритикале билан биргаликда қўшиб гектарига 250/150 кг/га меъёрларда уруғ сарфлаб, қатор ораси 60 см ҳар қаторга экилганда олинди.

Иккинчи йилни шароитларида ҳам тупроқ хажм массасини ўзгариши биринчи йилдаги каби экиш усуллари ва меъёрлари ҳамда ўғит меъёрларига боғлиқ холда бўлганлиги аниқланди.

Бу йили дастлабки олинган кўрсаткичларда тупроқни 0-30 см ли қатламидаги хажм массаси 1,238 г/см^3, 30-50 см да эса 1,286 г/см^3 ни ташкил қилиб, биринчи йилга нисбатан 0,03-0,09 г/см^3 га юқори бўлди. Барча вариантларда (хаттоки назоратда) ҳам тупроқ хажм массаси 0,021 г/см^3 га юқори бўлиб, вариантлар орасидаги қонуниятлар сақланиб қолди.

Шунингдек $N_{130}P_{90}K_{65}$ кг/га меъёрларда қўлланилган вариантларда ҳамда 2010 йил шароитида юқоридагиларга яқин маълумотлар олинди.

Таъкидлаб ўтамизки, изланиш йиллари тупроқни 50-70 см қатламларида биз қўллаган агротехник тадбирларни таъсири сезилмаганлиги учун, олинган маълумотларни баён қилмадик.

Умуман олганда эса такрорий экинлар экилиш усулларидан, меъёрларидан ва ўғит меъёрларидан қатъий назар тупроқни хажм массасини ўзгаришига экинларни қолдирган илдиз ва анғиз қолдиқларини мақбул таъсир кўрсатишлари аниқланди, лекин бурчоқни тритикале билан биргаликда қўшиб гектарига 250/150кг/га меъёрларда уруғ сарфлаб, ўғитларни $N_{100}P_{70}K_{50}$ кг/га меъёрда қўллаб, қатор ораси 60 см ҳар қаторга экилганда эса тупроқ хажм массасига доир янада яхши маълумотлар олишга эришилди.

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СОВРЕМЕННЫЕ ПОДХОДЫ К РАЗРАБОТКЕ И ЭКСПЕРТИЗЕ ТЕСТОВЫХ ЗАДАНИЙ В СИСТЕМЕ ОЦЕНКИ КАЧЕСТВА ОБРАЗОВАНИЯ

Аннотация: *В статье рассматриваются средства оценки, используемые в процессе суммативного оценивания, методика назначения закрытых тестов, примеры и модели, образец оценки, требования к средствам оценки.*

Ключевые слова: *внутренняя, первичная, тестологическая, итоговая экспертиза, общие, специальные требования, одобрение, тестовый дизайн.*

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MODERN APPROACHES TO DEVELOPMENT AND EXAMINATION OF TEST TASKS IN THE SYSTEM OF EDUCATION QUALITY ASSESSMENT

Annotation: *This article discusses the assessment tools used in the summative assessment process, the methodology for assigning closed tests, examples and models, a sample assessment, and requirements for assessment tools.*

Key words: *internal, primary, testological, final examination, general, special requirements, approval, test design.*

В педагогике применялось несколько форм оценки качества образования, и каждая из них имеет свои преимущества и недостатки.

Устные беседы и письменные работы

Эти методы позволяют глубоко оценить знания, умения и навыки обучающихся, а также развить коммуникативные способности и творческое мышление. Однако они требуют много времени на проведение и проверку, а также могут быть субъективными из-за человеческого фактора.

Тестовые задания

С середины XX века тесты стали широко использоваться благодаря возможности быстро и объективно оценивать знания большого числа обучающихся. Тесты позволяют стандартизировать процесс оценки, минимизировать влияние субъективных факторов и получить количественные данные для анализа.

Современные тенденции

Сейчас в педагогической практике часто сочетают разные формы оценки: тесты для проверки фактических знаний и письменные/устные работы для оценки аналитических и творческих способностей. Также активно внедряются цифровые технологии, позволяющие автоматизировать и разнообразить оценивание.

Несмотря на широкое применение тестов в оценке качества образования, полноценной альтернативы им пока не создано. Тестовые задания действительно остаются спорным инструментом, главным образом из-за неоднородного качества самих заданий. Низкое качество тестов часто связано с недостаточно продуманным процессом их разработки, что приводит к ограничению глубины оценки знаний и развитию у обучающихся навыков «обучения для теста», а не реальному пониманию материала.

В то же время тесты обеспечивают быстрый, стандартизированный и объективный способ проверки знаний большого числа обучающихся, что делает их незаменимыми в массовом образовании. Поэтому современные подходы к оценке качества образования всё чаще используют комбинированные методы — сочетая тесты с проектными заданиями, устными выступлениями, портфолио и другими формами, что позволяет более полно и объективно оценить достижения учащихся.

Отсутствие полноценной альтернативы тестам. Несмотря на критику, тесты остаются основным инструментом массовой оценки знаний благодаря своей скорости, стандартизации и объективности. Полноценной системы, полностью заменяющей тестирование, пока не создано.

Проблемы качества тестовых заданий. Низкое качество часто связано с недостаточно продуманным процессом разработки тестов. Это приводит к поверхностной проверке знаний и формированию у учащихся навыков «обучения для теста», а не глубокому пониманию материала.

Комбинированные методы оценки. Для более объективной и всесторонней оценки качества образования применяются сочетания тестов с

другими формами: проектами, устными ответами, портфолио и т.д.Такой подход помогает компенсировать ограничения тестирования, развивать творческое мышление и критическое восприятие.

Перспективы развития. Современные технологии и педагогические исследования направлены на улучшение качества тестовых заданий и интеграцию различных методов оценки.Важно совершенствовать процессы разработки тестов, проводить их апробацию и учитывать разнообразие форматов заданий.

Это - разработка спецификаций тестов, создание и редактирование тестовых заданий, экспертиза, утверждение, статистический анализ, редактирование тестовых заданий на основе анализа и т.д.

Учитывая это, следует сказать, что создание тестовых заданий перед экзаменационным днем проходит несколько этапов:

1) разработка спецификации испытаний;
2) создание и редактирование тестовых заданий;
3) обследование;
4) одобрение;
5) статистический анализ;
6) редактировать тестовые задания на основе анализа.

Невыполнение любого из этих шагов может поставить под угрозу его легитимность.

Также процесс экспертизы связан с концепцией валидности, и его качественная реализация обеспечивает успешное прохождение первых доказательств валидности, то есть «доказательств, связанных с содержанием теста».

В источниках, касающихся тестологии, отмечается, что процесс экспертизы обычно проводится в четыре этапа:

- *предварительная экспертиза;*
- *внутренняя экспертиза;*
- *тестологическая экспертиза;*
- *дать окончательное заключение.*

Предварительная экспертиза – это процесс теоретической проверки соблюдения автором теста правил тестовой оценки и внесения необходимых изменений [2]. После этого другой специалист еще раз анализирует тестовые задания и проводит экспертизу.

Внутренняя/внешняя экспертиза – это процесс теоретического определения соответствия тестового задания требованиям тестологии, наличия условий, отрицательно влияющих на определение реальных знаний тестируемого, и вынесения рекомендации по улучшению качества тестирования другим специалистом организации или старшими экспертами в соответствующей области.

После этого тестовые задания делятся на варианты тестирования, такие как 1-й, 2-й, 3-й вариант согласно спецификации заданию. Затем для определения достоверности и валидности теста утверждаются задания. Также

следует отметить, что согласование (апробация) должно быть организовано с соблюдением стандартов проведения экспертизы.

Результаты апробации изучаются и анализируются на основе математико-статистических моделей тестологами.

Тестологическая экспертиза – это процесс определения валидности, показателей достоверности, уровня сложности и дистракторного анализа тестовых заданий на основе результатов апробации, психометрического анализа.

В результате такого анализа установлено, что некоторые тесты абсолютно недействительны, а некоторые не соответствуют выводам теоретической экспертизы. После этого будет дано окончательное заключение.

Итоговая экспертиза — процесс извлечения из тестовых заданий допустимых по результатам тестологической экспертизы, вынесения заключения о занесении в базу данных и возврата недействительных для обработки автору теста.

Затем можно создать высокоэффективные тесты с использованием проверенных тестовых примеров.

Все тестовые задания, созданные на экзамене, анализируются специалистами, то есть экспертами в области, и устраняются их недостатки. В ходе этого процесса эксперты:

1. Уделяется внимание понятности и точности теста.
2. Тестовые задания проверяются на соответствие правилам создания тестов.
3. Учитывается соразмерность задач спецификации.

В этом процессе могут участвовать несколько экспертов, каждый эксперт может анализировать один аспект тестового задания или все эксперты могут анализировать его комплексно. Постановка перед экспертами четких целей повысит эффективность процесса экспертизы. Кроме того, «обычно количество экспертов для каждого испытания не должно быть менее трех человек».

Кроме того, выполняемая в процессе работа различается в зависимости от характера предмета. Потому что проверка уровня знаний по конкретным предметам и социально-гуманитарным предметам отличается уникальностью формируемой предметной области. В частности, невозможно напрямую проверить предметные области и конструкции, сформированные учащимися на родном языке. На этой основе в ходе тестового экзамена специалисты рассматривают задания, основанные на уникальности науки о родном языке.

К теоретическому рассмотрению тестового задания предъявляются два требования. Это:

- общие требования;
- особые требования.

Общие требования-это правильная структура тестового задания, его валидность, достоверность, уровень сложности, уровень значимости, время,

затрачиваемое на выполнение задания, влияние теста на психологию ребенка, взаимодействие тестов и т. д.

Специальные требования – это требования, связанные с наукой, которые определяются исходя из науки, ее уникальности и содержания.

Тестовые задания подлежат теоретической проверке с учетом общих и частных требований [4]. Также при изучении качества тестовых заданий необходимо оценивать каждую их составляющую не только в отдельности, но и в системе связей с другими тестовыми заданиями.

В целом при теоретическом рассмотрении тестовых заданий основное внимание уделяется выяснению соответствия тестового задания требованиям тестологии, наличия каких-либо обстоятельств, отрицательно влияющих на определение реальных знаний тестируемого.

Ниже приведен пример теоретического экзамена по предмету математика (Начальная школа):

1.Какое действие выполняется последним в выражении: 350:5-40+74•5 ?

А) Умножение

В) деление

С) вычитание

Д) сложение

1. Методика задания: закрытый тест: один правильный ответ, тест с альтернативным ответом**.**

*2. Область содержаний**:** выполнение смешанных операций*

*3. Компетенция для оценки**:** понимание примера*

4. Навыки, подлежащие оценке: дифференция последовательность действий

5. Уровень сложности задания: 2

6. Время выполнения задания : 2 мин.

7. Критерии оценки: 2 балла.

8. Ключ теста: Д

9. Уровень значимости теста: средний

*10. Совместимость с учебной программой**:** подходящий*

*11. Степень значимости отвлекающих факторов: **А-** средний, **В-** средний, **С-** средний, **Д-** средний*

12. Психологический обзор теста: действительный

13.Наличия орфографических, методических, ориентировочных и технических ошибок: ошибок нет.

Средства оценки, используемые в процессе суммативного оценивания, должны соответствовать следующим требованиям:

содержание оценочного задания должно соответствовать знаниям и умениям, предусмотренным государственным образовательным стандартом и учебными программами;

содержание спецификации оценки охватывает все важные аспекты содержания предмета;

каждое задание должно соответствовать спецификации оценки;

оценка, присваиваемая каждому заданию, должна соответствовать сложности действий, необходимых для выполнения задания;

задания не отражают знания и умения, не предусмотренные государственным образовательным стандартом и учебными программами;

задания не могут предоставлять преимущества определенным группам (городским или сельским жителям, мальчикам или девочкам и т. д.);

каждое задание должно быть независимым, то есть одно тестовое задание, используемое в тесте, не поможет вам найти ответ на другое тестовое задание в том же тесте;

примеры и модели, используемые в задании, не являются в точности теми, которые даны в учебниках, а сформированы на основе новых примеров и моделей;

содержание задания не должно быть субъективным, известным только создателю теста или соответствовать его личным взглядам;

вопросительная часть задания не требует решения многих (трех и более) элементов;

Задание должно четко формулировать проблему, быть написано простым и понятным языком, понятным экзаменуемому, и быть одинаково понятным всем;

содержание задания не должно быть субъективным, известным только создателю теста или соответствовать его личным взглядам;

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следует избегать использования отрицательных слов в вопросительной части тестового задания, а при необходимости их следует выделять;

в задании четко указано, что требуется от экзаменуемого (его объем и ограничения по содержанию), а также даются конкретные указания экзаменуемому.

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ВИДЕОПРОДАКШЕН КАК ФОРМА ГРАЖДАНСКОГО УЧАСТИЯ: ОПЫТ СОЗДАНИЯ СОЦИАЛЬНЫХ РОЛИКОВ О ПРОБЛЕМАХ ЭКОЛОГИИ И ВОЛОНТЁРСТВА

Аннотация: *в условиях цифровой трансформации общества видеоконтент становится важнейшим инструментом гражданской активности. В статье рассматривается видеопродакшен как форма выражения общественной позиции и вовлечённости в социально значимые инициативы. На основе анализа видеопроектов, посвящённых экологическим проблемам и волонтёрской деятельности, выявлены ключевые приёмы визуального сторителлинга, механизмы воздействия на аудиторию и параметры оценки эффективности. Установлено, что видеоролики способствуют формированию культуры участия, стимулируют поведенческие изменения и способствуют развитию цифрового гражданства. Сделан акцент на межсекторальное сотрудничество как условие устойчивости таких инициатив.*

Ключевые слова: *видеопродакшен, гражданское участие, социальный видеоконтент, экология, волонтёрство, визуальная коммуникация, цифровое гражданство, сторителлинг*

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VIDEO PRODUCTION AS A FORM OF CIVIC ENGAGEMENT: THE PRACTICE OF CREATING SOCIAL VIDEOS ON ECOLOGY AND VOLUNTEERING

Abstract: *In the era of digital transformation, video content has become a powerful tool for civic engagement. This article explores video production as a form of expressing public concern and participating in socially significant initiatives. Based on the analysis of video projects addressing ecological issues and volunteer activities, the study identifies key visual storytelling techniques, mechanisms of audience engagement, and effectiveness metrics. The findings show that video content helps build a culture of participation, encourages behavioral shifts, and supports the development of digital citizenship. Emphasis is placed on cross-sector collaboration as a condition for the sustainability of such initiatives.*

Keywords: *video production, civic engagement, social video content, ecology, volunteering, visual communication, digital citizenship, storytelling*

Введение

Современное гражданское участие приобретает всё более разнообразные формы, выходящие за рамки традиционной протестной активности или институционального волонтёрства. Одним из наиболее ярких проявлений новой волны гражданской вовлечённости стало использование цифровых медиатехнологий — в частности, видеопроизводства — для выражения общественной позиции, привлечения внимания к социальным проблемам и организации горизонтальных сообществ вокруг значимых тем. Видеоролики, ориентированные на распространение в социальных сетях и цифровых платформах, становятся не просто инструментом коммуникации, но и формой действия: они способны инициировать дискуссию, вызвать эмоциональный отклик, побудить к личной или коллективной ответственности.

Особое место в этом контексте занимают видеопроекты, посвящённые вопросам экологии и волонтёрства. Глобальные вызовы, такие как изменение климата, загрязнение окружающей среды, утрата биоразнообразия, а также рост гуманитарных и социальных проблем в условиях кризисов, требуют не только институционального реагирования, но и широкой гражданской мобилизации. Социальный видеоконтент, направленный на освещение волонтёрских инициатив, уборок территорий, экологических акций и кампаний взаимопомощи, становится важным элементом в формировании культуры участия и устойчивого образа жизни.

Видеопродакшен в этом случае выполняет не только информационную и эстетическую функцию, но и становится формой цифрового активизма. Создание роликов, визуализирующих социальную и экологическую проблематику, способствует популяризации идеи личной вовлечённости, формированию новых идентичностей (например, «эковолонтёра» или «цифрового добронравного гражданина») и привлечению внимания к локальным инициативам с глобальным значением. Особенно важным это становится в среде молодёжи, активно потребляющей визуальный контент и воспринимающей видео как основной медиаканал.

Целью настоящей статьи является исследование видеопроизводства как формы гражданского участия, анализ приёмов и форматов создания социальных роликов на тему экологии и волонтёрства, а также оценка их эффективности и общественного воздействия. В рамках статьи рассматриваются конкретные примеры видеопроектов, реализованных как независимыми авторами, так и в рамках кампаний, поддерживаемых некоммерческими организациями и международными институтами. Анализ фокусируется на содержательном, визуальном и поведенческом аспектах, выявляя потенциал видеопродакшена как устойчивой практики цифрового гражданства в условиях медийного общества.

Теоретические основы видеопроизводства как формы гражданской активности

Современное гражданское участие всё чаще рассматривается не только как взаимодействие с государственными институтами или участие в выборах, но и как инициирование общественно значимых действий, в том числе через медиа. В условиях цифровой трансформации общества визуальные формы выражения гражданской позиции приобретают особую актуальность. Понятие «медиагражданственность» объединяет различные формы цифрового активизма, среди которых видеопроизводство занимает центральное место. С одной стороны, оно позволяет оперативно и наглядно освещать проблемы, с другой — стимулирует диалог и соучастие, создавая площадку для объединения людей вокруг общих ценностей и инициатив.

Видеоконтент в контексте гражданской активности выполняет несколько ключевых функций: информирующую, мобилизующую, идентификационную и коммуникативную. Информирующая функция проявляется в освещении экологических или социальных проблем, которые часто остаются за пределами внимания традиционных СМИ. Мобилизующая — в призыве к действию: участию в субботнике, донорской акции, благотворительном марафоне и т. д. Идентификационная функция позволяет зрителю почувствовать сопричастность к ценностям, продвигаемым в ролике. Наконец, коммуникативная функция реализуется в создании горизонтальных сетей взаимодействия между волонтёрами, активистами и широкой общественностью.

Важно отметить, что видеопроизводство как форма гражданского участия характеризуется высокой степенью доступности. Современные технологии позволяют создавать качественные видеоматериалы без значительных финансовых вложений: смартфоны, базовые программы для монтажа и открытые платформы для публикации делают процесс децентрализованным и демократичным. Это способствует расширению круга участников медиакоммуникации, особенно среди молодёжи и представителей локальных сообществ, которые ранее были исключены из публичного дискурса [1].

Визуальный сторителлинг, лежащий в основе большинства социальных роликов, сочетает в себе элементы журналистики, художественной выразительности и документального подхода. Краткость, выразительность, эмоциональная насыщенность — ключевые параметры, обеспечивающие эффективность такого контента в условиях информационного перенасыщения. Благодаря этому видеоролики на темы экологии и волонтёрства не только транслируют факты, но и формируют новое культурное восприятие участия, ответственности и сопричастности.

Анализ кейсов: социальные видеопроекты на тему экологии и волонтёрства

Рассмотрение реальных видеопроектов, посвящённых экологическим проблемам и волонтёрской деятельности, позволяет выявить ключевые

элементы их структуры, формы подачи, приёмы визуального сторителлинга и механизмы воздействия на аудиторию. Подобные видеоролики могут быть как инициативой отдельных граждан, так и результатом коллективной работы некоммерческих организаций, школьных и университетских сообществ, корпоративных волонтёрских групп.

Одним из распространённых форматов являются короткие эмоционально насыщенные видеоролики продолжительностью от одной до трёх минут, распространяемые через социальные сети. Эти видео, как правило, фокусируются на одной конкретной теме — загрязнении природной территории, истории волонтёрского проекта или конкретном примере гражданской инициативы. Главной целью таких материалов является пробуждение чувства ответственности и вовлечение зрителя в решение проблемы через личное участие, пожертвование или репост. Яркий пример — кампания «Чистые берега», в рамках которой волонтёры и блогеры совместно снимали видеоролики об уборке прибрежных зон и делились результатами через Instagram Reels и TikTok, используя популярную музыку и эффекты для привлечения молодёжной аудитории.

Другой тип проектов — документальные мини-фильмы продолжительностью от 5 до 10 минут, создаваемые НКО в сотрудничестве с профессиональными видеографами. Такие видео, например, представляют собой рассказ об истории конкретного волонтёра или экологического активиста, показывая их мотивацию, путь, трудности и достижения. Сильная сторона этого формата — персонализация темы, которая позволяет аудитории не только понять суть инициативы, но и почувствовать эмоциональную связь с героями. Такие видеоматериалы, как правило, размещаются на YouTube и используются также в рамках просветительских мероприятий, лекций и онлайн-курсов.

В последние годы растёт популярность анимационных социальных роликов, объясняющих экологические процессы (утилизация, переработка, изменение климата) в простой, доступной форме. Анимация позволяет отказаться от съёмок на месте, сосредоточиться на визуальных метафорах, статистике и кратком повествовании. Эти материалы легко адаптируются под разные языки, что делает их удобным инструментом для трансграничных кампаний [2,с.53].

Визуальные и сценарные приёмы, использующиеся в подобных видеопроектах, включают: контрастные образы (до и после), статистические вставки, кадры с участием детей и пожилых людей для усиления эмоционального фона, а также прямые обращения к зрителю от лица участников инициатив. Часто применяются методы ускоренной съёмки (таймлапс), инфографика и субтитры для повышения доступности.

Что касается платформ распространения, то лидирующие позиции занимают социальные сети (Instagram, VK, TikTok, YouTube), а также мессенджеры и локальные сайты сообществ. Распространение часто происходит органически, через репосты и рекомендации. Важную роль

играют хэштеги, визуальное оформление обложек и активное участие амбассадоров проекта — медийных или авторитетных лиц [3,с.227]

Эффективность и общественное воздействие

Оценка эффективности видеопроектов, посвящённых экологии и волонтёрству, требует комплексного подхода, сочетающего количественные показатели с анализом социальных последствий. В отличие от коммерческого контента, где основными метриками выступают охваты, клики и удержание внимания, социально ориентированные видеоролики оцениваются по их способности инициировать реальные действия, формировать устойчивую мотивацию и расширять круг вовлечённых граждан.

Среди количественных критериев эффективности — общее число просмотров, уровень вовлечённости (лайки, репосты, комментарии), география охвата, количество переходов на страницы инициатив и число регистраций на мероприятия, связанные с видео. Эти данные, как правило, легко доступны через встроенную аналитику платформ (YouTube Studio, Meta Insights, TikTok Analytics) и позволяют отслеживать динамику распространения роликов.

Однако наиболее значимыми являются качественные показатели, свидетельствующие о глубинном восприятии и мотивационном эффекте видеоконтента. Это отзывы зрителей, примеры подражательного поведения, вовлечение новых участников в проекты, создание производных инициатив. Например, после публикации серии видеороликов о посадке деревьев в рамках локальной кампании, другие сообщества начали самостоятельно организовывать аналогичные акции и документировать их в видеоформате, формируя цепочку визуального участия.

Нередко видеоролики используются как часть образовательных программ в школах и вузах, что позволяет не только расширить охват, но и закрепить эффект через обсуждение в аудитории. Особенно продуктивным оказывается сочетание видеоконтента с офлайн-мероприятиями: субботниками, благотворительными сборами, тематическими фестивалями. В этом случае видео играет роль эмоционального катализатора и средства фиксации результата, возвращая участникам чувство значимости проделанной работы.

Важно также отметить роль институциональной поддержки в повышении устойчивости видеопроектов. Интеграция видео в коммуникационные стратегии НКО, поддержка со стороны локальных администраций, использование материалов в рамках грантовых отчётов и публичных презентаций усиливают эффект визуальных кампаний и способствуют масштабированию. Кроме того, участие представителей бизнеса — в формате партнёрства, спонсорства или распространения видео на корпоративных площадках — позволяет привлекать дополнительные ресурсы и аудиторию [4,с.376].

Заключение

Видеопродакшен как форма гражданского участия демонстрирует устойчивую тенденцию к расширению своего влияния на общественные процессы. В условиях цифровой среды он становится не просто способом передачи информации, но и полноценным инструментом мобилизации, формирования сообществ и визуализации позитивных социальных практик. Особенно ярко это проявляется в видеопроектах, посвящённых вопросам экологии и волонтёрства, где визуальный контент не только фиксирует активность, но и стимулирует её воспроизводство в новых контекстах.

Анализ теоретических подходов и практических кейсов показывает, что видеоконтент может выполнять множественные функции: образовательную, мотивационную, коммуникативную и репрезентативную. Благодаря доступности технологий и децентрализации распространения, видеоролики становятся частью горизонтальной общественной коммуникации, вовлекая в неё всё больше участников, в том числе молодёжь и локальные инициативные группы.

Эффективность таких проектов проявляется не только в количественных показателях охвата, но прежде всего — в способности формировать культурные паттерны участия и устойчивые модели поведения. Визуальные образы становятся частью повседневного символического пространства, отражая и одновременно формируя ценности экологического сознания, солидарности и взаимопомощи.

В перспективе развитие видеопродакшена как формы гражданского участия требует институционального признания и поддержки: создания платформ для распространения социального видео, включения визуального контента в образовательные и просветительские программы, расширения сотрудничества между активистами, НКО, государственными структурами и медиаиндустрией. Это позволит не только повысить качество и охват таких проектов, но и укрепить их роль как одного из ключевых каналов общественного самовыражения в цифровую эпоху.

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ОСНОВНЫЕ ОБЛАСТИ ПРИМЕНЕНИЯ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В HR-МЕНЕДЖМЕНТЕ

Аннотация: *В данной работе рассматривается особенности применения искусственного интеллекта в предприятии, так в менеджменте. Его внедрение позволяет компаниям не только оптимизировать текущие процессы, но и строить долгосрочные стратегии управления персоналом, адаптированные к современным вызовам. Это делает искусственный интеллект не просто инструментом, а важнейшим элементом успешного управления человеческими ресурсами.*

Ключевые слова: *искусственный интеллект, менеджмент, HR, управления, инструменты.*

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MAIN AREAS OF APPLICATION OF ARTIFICIAL INTELLIGENCE IN HR MANAGEMENT

Abstract: *This paper examines the specifics of using artificial intelligence in an enterprise, both in management. Its implementation allows companies not only to optimize current processes, but also to build long-term HR strategies adapted to modern challenges. This makes artificial intelligence not just a tool, but a critical element of successful HR management.*

Key words: *artificial intelligence, management, HR, controls, tools.*

Искусственный интеллект в рамках управления персоналом можно рассматривать как инструмент автоматизации бизнес-процессов, технологию для анализа/прогнозирования показателей и создания сервисов для сотрудников. В современных условиях расширяется функциональность

инструментов на основе ИИ. Все больше процессов и подфункций HR покрываются искусственным интеллектом. Некоторые задачи в рамках подфункций HR уже реализованы в виде конкретных решений.

Подфункции / задачи HR, которые уже решает ИИ

Рекрутмент (отбор, подбор и привлечение персонала):

• отбор подходящих резюме на основе данных

• автоматизация сбора и структурирования данных о кандидатах (резюме) и о вакансиях.

• автоматизация массового набора персонала (вкл. автоматизацию обратного звонка кандидатов, отсев некачественных заявок от кандидатов)

• автоматизация поиска кандидатов на сайтах с вакансиями по заявленным критериям

• оценка и подбор кандидатов на лидерские программы

• планирование подбора

• предварительное тестирование кандидатов на основе данных и опросов

Прием и адаптация персонала:

• распознавание кадровой документации

• прогноз прохождения испытательного срока

• виртуальный помощник сотрудника для прохождения онбординг

• рекомендации для новых сотрудников по данным предыдущего опыта

Обучение персонала:

• помощь в создании обучающих материалов

• распределение тегов по материалам, формирование заголовков и описания курсов

• персональные рекомендации с обучающими материалами и курсами

• голосовые тренажеры для отработки навыков переговоров с клиентами

• анализ эффективности обучения и рекомендации по улучшению

• рекомендации по экспертам внутри компании

Развитие персонала (в т. ч. кадровый резерв / механизмы преемственности)

• рекомендации по внутренним вакансиям для сотрудников

• определение потенциальных кандидатов-преемников

• платформы внутреннего рынка труда

• формирование индивидуальных карьерных траекторий на основании потребностей организации, навыков и предпочтений сотрудника

• рекомендации по карьерному росту для сотрудников

Управление загрузкой и численностью

• прогнозирование увольнений сотрудников, оценка рисков и причин

• планирование загрузки

• моделирование внутреннего спроса и предложения рынка труда

Благополучие сотрудников (wellbeing), охрана труда и безопасность

• мониторинг психологического состояния сотрудников, в т. ч. прогнозирование выгорания

• отслеживание тональности комментариев на корпоративном портале

• построение и анализ социальных графов (моделей взаимодействия внутри организации)

• прогноз заболеваемости и рекомендации по ее предотвращению (например, COVID-19)

• видеоанализ для контроля соблюдения техники безопасности

Вознаграждение (финансовая мотивация)

• анализ текущего уровня вознаграждения, сравнение с рыночными показателями

• расчет предложения по заработной плате для кандидата с учетом рыночных данных и опыта кандидата

• выявление предвзятости менеджеров к вознаграждению сотрудников

Управление эффективностью (Performance management)

• определение качества поставленных целей

• рекомендации по повышению эффективности на основе данных прошлых периодов и цифрового следа

• сбор и анализ данных об эффективности сотрудника для оценочных мероприятий

Поддержка HR-специалистов

• формирование текстов (должностные инструкции, вакансии, письма, операционные инструкции, документы и положения)

• автоматизация сбора и структурирования данных (парсинг) о внутренних новостях в организации

• процесс-майнинг (анализ и оптимизация) HR-процессов

• персональный ассистент для рекрутера (назначение встреч, интервью, рассылка оферов и др.)

Опросы / анализ вовлеченности

• анализ результатов опросов с открытыми ответами, кластеризация результатов

• проведение выходных интервью (exit-interview)

• подготовка текстов опросов по результатам анализа лучших практик[74]

Плюсы применения ИИ в управлении персоналом:

Автоматизация шаблонных операций. Искусственному интеллекту по силам выполнение множества рутинных задач: обработки данных, составления отчетов и распределения задач сотрудникам. Благодаря передаче шаблонных операций ИИ, сотрудники отдела управления персоналом могут сосредоточиться на стратегически важных задачах: разработке политики HR и подборе высококвалифицированных кадров.

Улучшенный подбор персонала. Можно использовать ИИ для анализа большого объема данных о потенциальных кандидатах, чтобы выявить самых подходящих из них для конкретной вакансии. Это позволяет сократить время

[74] Искусственный интеллект в HR. Кейсы российского рынка [электронный ресурс]. //Url: https://data.tedo.ru/publications/ai-in-hr.pdf (Дата обращения: 10.01.2025).

и ресурсы, затрачиваемые на процесс подбора персонала, и повысить вероятность найти и привлечь наиболее квалифицированных сотрудников.

Улучшение эффективности обучения и развития. ИИ может помочь в создании персонализированных программ обучения для сотрудников, а также предложить рекомендации по развитию карьеры на основе анализа данных о производительности и навыках. Это позволяет повысить эффективность обучения и развития сотрудников, что в свою очередь может улучшить результативность всего коллектива.

Минусы применения ИИ в управлении персоналом:

Потеря человеческого фактора. Использование ИИ может привести к уменьшению межличностного взаимодействия между управленцами и сотрудниками. Люди могут испытывать необходимость общения и получения поддержки от других людей в рабочей среде, а ИИ не всегда может обеспечить эту эмоциональную составляющую.

Недостаток гибкости. ИИ основан на алгоритмах и данных, которые были использованы при его создании. Он может стать неэффективным в ситуациях, когда требуется гибкость и адаптация к изменяющимся условиям. Решения, принятые на основе анализа ИИ, могут быть недостаточно адаптированы к уникальным ситуациям и особенностям каждого сотрудника.

Проблемы сохранения конфиденциальности. Использование ИИ в задачах управления персоналом потребует сбора и обработки больших объемов информации о сотрудниках. Конечно, существуют опасения относительно сохранения таких данных. Неправильное использование или утечка такой информации может создать серьезные проблемы как для сотрудников, так и для организации в целом.

Недостаток этики и справедливости. ИИ может быть предвзятым или несправедливым в плане принятия решений, особенно в контексте управления персоналом. Алгоритмы ИИ могут основываться на стереотипах и предубеждениях, что может привести к дискриминации и неравенству среди сотрудников[75]

Искусственный интеллект – достаточно зрелая технология, которая развивается на разных уровнях уже долгое время и применяется в разнообразных отраслях и функциональных направлениях бизнеса. На волне нового всплеска развития инструментов на основе искусственного интеллекта и роста рынка HRTech-инструментов ИИ начинает все активнее использоваться и в рамках управления человеческим капиталом. Однако такое активное развитие искусственного интеллекта в сфере, напрямую связанной с человеком, по-разному оценивается в профессиональном сообществе. Существует ряд аргументов, доказывающих дополнительные возможности и

[75] Плюсы и минусы применения искусственного интеллекта в сфере управления персоналом [электронный ресурс]. //Url: https://proaction-study.ru/plyusy-i-minusy-primeneniya-iskusstvennogo-intellekta (Дата обращения: 10.01.2025)

эффективность применения этой технологии в HR, но также важно задуматься и о рисках, которые тоже присутствуют.

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СУЩНОСТЬ И ПОНЯТИЕ КОНКУРЕНТОСПОСОБНОСТИ ПРЕДПРИЯТИЯ В УСЛОВИЯХ ОГРАНИЧЕННОСТИ РЕСУРСОВ

Аннотация: *В данной работе рассматривается сущность и понятие конкурентоспособности предприятия, теоретические аспекты маркетинговой деятельности и анализируется методы оценки маркетинговой деятельности предприятия как фактора его конкурентоспособности*

Ключевые слова: *конкурентоспособность, маркетинг, оценка, факторы ресурсы.*

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THE ESSENCE AND CONCEPT OF ENTERPRISE COMPETITIVENESS IN CONDITIONS OF LIMITED RESOURCES

Abstract: *This paper examines the essence and concept of enterprise competitiveness, theoretical aspects of marketing activities and analyzes methods for assessing the marketing activities of an enterprise as a factor in its competitiveness.*

Key *words: competitiveness, marketing, evaluation, factors resources.*

Проблема повышения конкурентоспособности признается одной из важнейших в теории и практике экономической науки. Особенное значение это имеет для предприятий, конкурентные позиции которых на современных мировых рынках остаются недостаточно высокими.

В современных условиях рыночной экономики рынок товаров и услуг стремительно насыщается, из-за этого идет усиленная конкуренция между предприятиями, которые выпускают однородную продукцию.

Конкурентоспособность предприятия – это, прежде всего лишь сравнительная, а значит, относительная оценка свойств товара или услуги. По своей сути конкурентоспособность предприятия – это предпочтение ее товара потребителем. Свойство это зависит не только от самого продукта, но в значительной мере от продуктов-конкурентов, на фоне которых потребитель и дает свою оценку конкурентоспособности именно данного образца, а точность этой оценки подтверждает фактом траты денег на покупку[76].

Таким образом, под конкурентоспособностью предприятия следует понимать его способность производить товары или услуги, наиболее полно удовлетворять требованиям покупателей в отношении совокупности основных потребительских свойств (т.е. ценовых и качественных характеристик) по сравнению с аналогичными товарами, представленными на данном целевом рынке

Конкуренция – соперничество между экономическими субъектами (предприятиями, отраслями, государствами и т.д.) за ограниченные ресурсы, (материальные, финансовые, человеческие, временные и т.д.) посредством поиска оптимальных методов решения существующих задач, которые, в конечном итоге, служат интересам всего общества и стимулируют переход экономической системы на новый этап развития.

Данная трактовка конкуренции базируется на учете современных тенденций в понимании этого понятия, объединяя подходы к конкуренции, с одной стороны, как к борьбе, с другой, как к стимулу, который является залогом развития общества и вывода экономической системы на новый этап развития.

А.А. Асеев отмечает, что конкурентоспособность – это борьба за наиболее выгодные условия в целях получения максимальной прибыли[77]. В свою очередь, Д.В. Цируль выделяет конкурентоспособность, как способ эффективного распределения ограниченных ресурсов общества. Им же отмечается, что конкурентоспособность выполняет стимулирующую функцию. Кроме того, посредством конкурентоспособности происходит распределение доходов в соответствии с вкладом и эффективностью использования факторов производства. С.И. Ожегов в «Толковом словаре русского языка» термин конкурентоспособность трактует, как способность выдерживать конкуренцию, противостоять конкурентам.

Р.А. Фатхутдинов[78] дает следующее определение конкурентоспособности – это способность объекта выдерживать конкуренцию в сравнении с аналогичными объектами на данном рынке. Автор подчеркивает, что товар или услуга являются конкурентоспособными или неконкурентоспособными на конкретном рынке.

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[76] Владимирова, Л.П. Прогнозирование и планирование в условиях рынка [Текст] : Учебное пособие / Л.П. Владимирова. – М.: Издательский Дом «Дашков и К0 », 2000. – 346 с

[77] Асеев, А. А. Конкурентоспособность / А. А. Асеев. — М.: Просвещение, 2014. — 36 с.

[78] Фатхутдинов, Р. А. Стратегический менеджмент [Текст]: учебное пособие / Р. А. Фатхутдинов – М.: ЗАО «Бизнес-школа Интел-Синтез», 2009. - 641 с

Многообразие существующих подходов к понятию конкурентоспособности в настоящее время в экономической литературе определяется: либо особенностями постановки задачи и цели исследования, что приводит автора к необходимости акцентирования своего внимания на том или ином аспекте конкурентоспособности; либо особенностями выбора предмета исследования, в качестве которого могут выступать предметы конкуренции (товар, услуга) и субъекты конкуренции (предприятия, отрасли, регионы, национальная экономика, государство), и объекты конкуренции (спрос, рынок, факторы производства: природно-сырьевые ресурсы, рабочая сила, капитал, ценные бумаги, информация, политическая власть), и масштабы деятельности (товарные рынки, отраслевые рынки, региональные рынки, межрегиональные рынки, мировые рынки)

Конкурентоспособность определяется на основании многих факторов, но наиболее объективный результат дают математические методы оценки, то есть расчет коэффициентов и сравнение их со среднеотраслевыми показателями.

Факторы, влияющие на конкурентоспособность

Условия, характер и уровень конкурентной борьбы являются определяющими факторами при анализе рынка и выработке эффективной стратегии расходования ресурсов. Оценке конкурентного поведения способствует определение следующих факторов:

— ключевые экономические показатели рынка;

— основные конкурентные силы и факторы, влияющие на них;

— конкуренты, их положение и позиция в отрасли;

— основные критерии, определяющие успех в конкурентной борьбе;

— игроки, задающие вектор конкурентной борьбы;

— степень привлекательности отрасли с точки зрения возможной прибыльности.

Анализ данных показателей закладывает основу для стратегии конкурентной борьбы в условиях изменяющегося потребительского рынка. В маркетинговой практике выделяют два возможных сценария развития конкуренции:

Горизонтальный — рыночное пространство буквально «переделывается» в ходе постоянной борьбы за позиции в отрасли, для чего используются реклама, ценовая политика и др.

Вертикальный – за счет ориентации на потребности целевой аудитории и повышения качества товаров/услуг осваиваются новые технологии и рынки.

Как правило, предприятия не делают ставку на какой-то один вариант, предпочитая комбинировать оба. Но использование вертикального и горизонтального сценариев конкуренции оказывается недостаточным для того, чтобы гарантировать компании успешность в отрасли. Для определения выгодного конкурентного преимущества необходимо учитывать ряд факторов, среди которых:

— агрессивное поведение других игроков, сопровождающееся постоянными рекламными и ценовыми войнами и стабильным/снижающимся объемом продаж. Возможной реакцией в этом случае становится производство новых товаров;

— легкость вхождения на рынок, характеризующаяся постоянно меняющимся составом участников и стабильно низкой прибыльностью. Решением может стать переориентация бизнеса;

— существование товаров-субститутов, которые представляют угрозу для компании. Рекомендация заключается в максимизации преимуществ товара;

— зависимость от потребителей в связи с их малочисленностью или высокой организованностью, чувствительностью к ценам и наличием аналогичных товаров/услуг у конкурентов. Как вариант возможного поведения рассматривается максимальное внимание существующим потребителям и выгодные условия для новых клиентов;

— зависимость от поставщиков, признаками которой являются отсутствие товаров-субститутов, ограниченное количество или высокая степень организованности поставщиков. В качестве рекомендации выступает тесное взаимодействие с имеющимися поставщиками и поиск альтернативных партнеров и вариантов сотрудничества.

Удобным инструментом определения вектора развития конкурентного преимущества и сценария поведения компании среди других игроков отрасли является матрица, предложенная М. Портером[79].

Опираясь на нее, предприятие имеет возможность выбрать наиболее оптимальный вид конкурентоспособности.

Управление конкурентоспособностью представляет собой последовательность шагов, позволяющих контролировать текущее положение компании в отрасли и разрабатывать эффективные тактические программы для усиления позиций предприятий на рынке. В качестве основных этапов управления конкурентоспособностью выступают:

Контроль качества продукта – оценивается степень соответствия продукта потребностям целевой аудитории;

Выбор типа конкурентного преимущества – оцениваются возможности предприятия, недостатки и преимущества продукта;

Оценка конкурентоспособности – при помощи различных методик определяется текущий уровень конкурентоспособности продукта (SWOT-анализ, модель 5 сил М.Портера, многоугольник конкурентоспособности и др.);

Постоянное повышение конкурентоспособности – в зависимости от стадии ЖЦТ определяются необходимые мероприятия (внедрение – обратная связь, оценка уровня удовлетворенности продуктом; рост – улучшение

[79] Лифиц, И.М. Теория и практика оценки конкурентоспособности товаров и услуг [Текст] : учебник / И.М. Лифиц. – М.: Юрайт-М, – 2001. – 432 с.

основных свойств товара, внедрение его модификаций и др.; спад – выпуск усовершенствованных версий, акцент на частоте и длительности потребления продукта);

Создание системы контроля – осуществляется в 4 этапа:

— мониторинг и оценка (проведение сравнительного анализа с продуктами конкурентов, мониторинг изменений в потребностях целевой аудитории и технологиях);

— применение стратегии;

— разработка тактических программ (направление маркетинговых усилий на улучшение слабых мест продукта);

— контроль реализации стратегии.

Конкурентоспособность является решающим фактором коммерческого успеха предприятия и объективно характеризует его возможности и уровень приспособленности к рыночным условиям. Верный выбор конкурентного преимущества и стратегии поведения на рынке обеспечивает бизнесу долгосрочные перспективы повышения прибыльности.

Таким образом конкурентоспособность предприятия – это показатель эффективности использования им экономических ресурсов в сравнении с конкурентами. Ее оценка необходима как самой организации для разработки мероприятий по увеличению доли рынка и выходу на новые рынки сбыта, так и другим заинтересованным лицам: инвесторам для выгодного вложения капитала; потенциальным партнерам для принятия решений о сотрудничестве; банкам при рассмотрении вопроса о кредитовании.

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МЕТОДЫ ОЦЕНКИ ВЛИЯНИЯ МАРКЕТИНГОВОЙ ДЕЯТЕЛЬНОСТИ НА ЭФФЕКТИВНОСТЬ ДЕЯТЕЛЬНОСТИ ПРЕДПРИЯТИЯ

Аннотация: *Данная работа рассматривает взаимосвязь маркетинговой деятельности и эффективности деятельности предприятия. Из подробно разбирается понятие эффективности, выделяя экономическую эффективность как ключевой фактор. В целом можно сделать вывод, что эффективность предприятия – комплексный показатель, отражающий способность предприятия достигать целей, оптимально используя имеющиеся ресурсы.*

Ключевые слова: *эффективность, маркетинг, экономическая эффективность, оценка, факторы ресурсы.*

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METHODS FOR ASSESSING THE IMPACT OF MARKETING ACTIVITIES ON THE EFFICIENCY OF AN ENTERPRISE

Abstract: *This work examines the relationship between marketing activities and the efficiency of the enterprise. It examines in detail the concept of efficiency, highlighting economic efficiency as a key factor. In general, it can be concluded that the efficiency of an enterprise is a complex indicator reflecting the ability of the enterprise to achieve its goals through the optimal use of available resources.*

Key words: *efficiency, marketing, economic efficiency, evaluation, factors resources.*

Сложность и не полная разработка вопросов, связанных с маркетинговой оценкой эффективности затрат на рекламу, а также

необходимость реализации индивидуального подхода в каждом конкретном случае не позволяет, как правило, давать готовые рекомендации и советы.

Эффективность затрат — это отношение количественного выражения эффекта к затратам, вызвавшим этот эффект. Основная часть проблемы при оценке эффективности затрат на рекламу заключается в определении числителя дроби. Базисом, основным источником проблемы являются[80]:

- многогранность и многозадачность анализируемого процесса, то есть рекламы. Реклама — это и информационный процесс, и мероприятия по продвижению и сбыту, и процесс социальной коммуникации.
- конечная неопределенность процесса, на ход которого оказывают существенное влияние достаточно большое число внешних факторов.

Многозадачность и конечная неопределенность - объективный источник проблем и трудностей анализа эффективности затрат на рекламу.

На практике можно выделить три основных направления работ по анализу эффективности: анализ коммуникативной эффективности рекламной кампании, то есть в качестве числителя дроби рассматривают число рекламных контактов, достигнутое в результате каких-либо мероприятий; анализ финансовой или коммерческой эффективности как отношение прироста объема сбыта (прибыли, оборота) к затратам, которые были для этого сделаны; оценка качества рекламного материала, то есть оценка того, насколько эффективна форма и содержание рекламного обращения позволяют этому обращению выполнять возложенную на него функцию.

Абсолютно точно определить эффективность отдельных средств рекламы, рекламной кампании в большинстве случаев не представляется возможным[81].

Однако и приблизительные подсчеты оправдывают себя. Различают экономическую эффективность рекламы и эффективность психологического воздействия отдельных средств рекламы на сознание человека (привлечение внимания к рекламе, фиксация в памяти и т.п.). Причем психологическое воздействие наиболее результативно, если оно приводит потенциальных потребителей к совершению покупки. Таким образом, экономическая эффективность рекламы зависит от степени ее психологического воздействия на человека.

Экономическую эффективность рекламы чаще всего определяют путем измерения ее влияния на развитие товарооборота. Наиболее точно установить, какой эффект дала реклама, можно лишь в том случае, если увеличение сбыта товара происходит немедленно после воздействия рекламы[82]. Это наиболее вероятно в случаях рекламирования новых товаров повседневного спроса.

Степень действенности рекламного средства условно можно оценить в конкретном предприятии по формуле:

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[80] И. Ансофф: "Стратегический маркетинг". Вестник МГУ. Сер. 14. Стратегия. 2012. № 4. С. 54-63. (дата обращения 13.02.2024)
[81] Левитт: "Маркетинговая миопия". Harvard Business Review. 2018. № 5. (дата обращения 07.02.2024)
[82] American Marketing Association. Альпина Паблишер, 2016. - С. 25. (дата обращения 07.02.2024)

$$К = Ч/ЧК \quad (1)$$

где ЧК - число контактов со всеми клиентами,

ЧП - число клиентов, которых реклама побудила к покупке.

Чтобы выявить, в какой степени реклама повлияла на рост товарооборота, анализируют оперативные и бухгалтерские данные. При этом следует иметь в виду, что помимо рекламы, на реализацию товара сказываются его качество и потребительские свойства, цена, внешний вид, а также место расположения торгового предприятия, уровень культуры обслуживания покупателей, наличие в продаже аналогичных изделий или продуктов,

Дополнительный товарооборот под воздействием рекламы определяется по формуле:

$$Тд = Тс * Кп * Д \quad (2)$$

где Тд - дополнительный товарооборот под воздействием рекламы, смн.;

Тс - среднедневной товарооборот до рекламного периода, смн.;

Кп – коэффициент прироста среднедневного товарооборота за рекламный и послерекламный периоды;

Д - количество дней учета товарооборота в рекламном и послерекламном периодах.

Для расчета экономического эффекта можно использовать следующую формулу:

$$Э = Тд + Нт - (Uд + Uр) \quad (3)$$

где Э - экономический эффект рекламирования, смн.;

Тд - дополнительный товарооборот под воздействием рекламы, смн.;

Нт - торговая надбавка на товар, в % к цене реализации;

Uд- дополнительные расходы по приросту товарооборота, смн;

Uр-расходы на рекламу.

В данном случае мы сопоставляем полученный эффект от проведения рекламного мероприятия с затратами на его осуществление. Результаты такого соотношения могут выражаться в трех вариантах:

1. Эффект от рекламного мероприятия равен затратам на его проведение.
2. Эффект от рекламного мероприятия больше затрат (прибыльное).
3. Эффект от рекламного мероприятия меньше затрат (убыточное).

Однако полученных данных еще недостаточно для сопоставления экономической эффективности затрат на проведение различных рекламных мероприятий. Более точно эффективность затрат на рекламу характеризует ее рентабельность. Рентабельность рекламы - это отношение полученной прибыли к затратам. Она определяется по формуле:

$$Р = \frac{П * 100}{U} \quad (4)$$

где Р - рентабельность рекламирования товара, %;
П - прибыль, полученная от рекламирования товара, смн.;
U - затраты на рекламу данного товара, смн.

Об экономической эффективности рекламы можно также судить по тому экономическому результату, который был достигнут от применения рекламного средства или проведения рекламной кампании. Экономический результат определяется соотношением между прибылью от дополнительного товарооборота, полученного под воздействием рекламы, и расходами на нее.[83]

Таким образом, подводя итоги теоретическому исследованию можно сделать выводы о том, что реклама в нынешней экономической ситуации очень быстро стала необходимой частью практически всех сторон жизни общества. На сегодняшний день рынок рекламы имеет свою структуру, здесь установлены определенные пропорции между отдельными видами рекламной деятельности, сложились отношения между основными субъектами рекламного процесса.

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ГЕНДЕРНЫЕ АСПЕКТЫ ВОДНОГО ХОЗЯЙСТВА В СТРАНАХ ЦЕНТРАЛЬНОЙ АЗИИ

Аннотация. *Статья посвящена анализу нормативно-правового регулирования и институциональных практик, связанных с обеспечением гендерного равенства в сфере водного хозяйства стран Центральной Азии. На основе трёхуровневого подхода: (1) законодательства, (2) деятельности профильных министерств/ассоциаций водопользователей, (3) образовательных программ рассмотрены примеры Узбекистана, Казахстана, Кыргызстана, Таджикистана и Туркменистана. Исследование выявляет, что несмотря на наличие национальных стратегий по гендерному равенству и участие стран в международных инициативах, секторальная реализация этих принципов в водном управлении остаётся ограниченной. Водное законодательство преимущественно гендерно-нейтрально, доля женщин в водохозяйственных структурах и инженерно-техническом образовании значительно ниже паритетного уровня.*

Ключевые слова: *гендер, гендерный аспект, гендерное равенство, водное хозяйство, Центральная Азия, женщины в управлении, законодательство, гендерная стратегия, водные ресурсы, национальные стратегии по гендерному равенству, международные инициативы, секторальная реализация.*

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GENDER ASPECTS OF WATER MANAGEMENT IN CENTRAL ASIAN COUNTRIES

Abstract. *The article analyzes the legal framework and institutional practices related to ensuring gender equality in the water sector in Central Asian countries. Based on a three-tier approach: (1) legislation, (2) activities of relevant ministries/water user associations, (3) educational programs, the examples of Uzbekistan, Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan are considered. The study reveals that despite the existence of national strategies on gender equality and the countries' participation in international initiatives, the sectoral implementation of these principles in water management remains limited. Water legislation is predominantly gender-neutral, the share of women in water management structures and engineering and technical education is significantly below the parity level.*

Key words: *gender, gender aspect, gender equality, water management, Central Asia, women in management, legislation, gender strategy, water resources, national strategies on gender equality, international initiatives, sectoral implementation.*

Введение. Принцип равенства женщин и мужчин является одним из фундаментальных основополагающих элементов системы прав человека. Он закреплен в ряде ключевых документов, включая Всеобщую декларацию прав человека 1948 года, Международный пакт о гражданских и политических правах 1966 года, а также Конвенцию о ликвидации всех форм дискриминации в отношении женщин 1979 года (CEDAW). Эти международные акты не только провозглашают равные права, но и возлагают на государства обязанность по устранению структурных барьеров к их реализации, включая в секторальных политиках.

Понятие «гендер» в современном научном и нормативно-правовом дискурсе трактуется как социально сконструированные роли, ожидания и нормы, приписываемые людям в зависимости от их пола. Гендерный аспект, соответственно, отражает влияние этих ролей и норм на доступ к ресурсам,

участие в управлении, а также распределение выгод и бремени в различных сферах жизни. В секторе водного хозяйства гендерные аспекты проявляются, например, в том, кто принимает решения об использовании воды, кто отвечает за её распределение, и кто подвергается наибольшему воздействию при её нехватке.

Интеграция гендерных аспектов в управление водными ресурсами получила международное признание как необходимое условие для устойчивого развития. Это наглядно зафиксировано в Повестке дня в области устойчивого развития на период до 2030 года, где Цель 5 (гендерное равенство) и Цель 6 (обеспечение наличия и рационального использования водных ресурсов) рассматриваются во взаимосвязи. Участие женщин и мужчин на равных началах в управлении водными ресурсами способствует более справедливому водопользованию, снижению социального напряжения, улучшению качества услуг и повышению эффективности водного сектора в целом.

Центральноазиатские государства ратифицировали CEDAW и подтвердили свою приверженность Целям устойчивого развития. На уровне законодательства в странах региона закреплены принципы равноправия и недискриминации. Тем не менее, отраслевое водное законодательство, включая водное, традиционно фокусировалось на техническом регулировании, в значительной мере игнорируя гендерные аспекты. Это отражается и на практике: по оценкам Всемирного банка, женщины составляют менее 20% работников водного сектора в регионе, а их участие в инженерных и управленческих позициях крайне ограничено[84].

Современное водное управление в Центральной Азии по-прежнему характеризуется гендерным дисбалансом, что препятствует реализации принципов инклюзивности и справедливости. Это делает анализ гендерных аспектов водного сектора особенно важным в контексте растущего давления на водные ресурсы и необходимости равного участия в управленческих процессах.

Целью данной статьи является проведение сравнительно-правового анализа нормативно-правового регулирования гендерных аспектов водного хозяйства в странах Центральной Азии. В рамках исследования основное внимание будет уделено трем уровням: (1) национальному законодательству; (2) институциональным практикам; (3) образовательной системе. В данной работе применялись сравнительно-правовой, аналитический и логический **методы исследования**.

Казахстан

Национальное законодательство. В Казахстане основным источником в сфере гендерного равенства является Закон Республики Казахстан № 223-IV от 8 декабря 2009 года «О государственных гарантиях равных прав и равных

[84] Душанбинский форум «Женщины и вода»: мобилизация усилий для обеспечения водной безопасности // Central Asia Climate Portal. – 2024. – URL: https://centralasiaclimateportal.org/ru/душанбинский-форум-женщины-и-вода-м (дата обращения: 23.06.2025).

возможностей мужчин и женщин». Он устанавливает равенство полов во всех сферах общественных отношений и обязует работодателей и госорганы обеспечивать равные возможности для женщин и мужчин. Закон ввел понятия гендерного равенства, гендерной дискриминации и утвердил принципы государственной гендерной политики. В частности, статья 10 требует от работодателей создания условий для равных возможностей на рабочих местах.

Кроме того, в Казахстане реализуются стратегические документы – Стратегия гендерного равенства на 2006-2016 годы (утратила силу) и Концепция семейно-гендерной политики до 2030 года (принята в 2016 г.). Последняя определяет приоритеты в продвижении женщин на руководящие позиции, защите их прав и сочетает цели гендерного равенства с социально-экономическим развитием. Эти документы, хотя и общесоциальные, создают рамки и для водного сектора.

Водный кодекс РК не содержит специальных гендерных норм. В нем декларируются права граждан и пользователей на воду без указания пола. Тем не менее, благодаря действию закона 2009 г. проводится гендерная экспертиза новых нормативных актов, а в местных исполнительных органах вводится должность советника по гендерным вопросам[85].

Таким образом, прямое упоминание гендера в контексте управления водными ресурсами в законах отсутствует, но косвенное включение осуществляется через общие требования равноправия и недопущения дискриминации, обязательные и для водной отрасли.

Институциональные практики. Управление водными ресурсами в Казахстане осуществляется государством через Министерство водных ресурсов и ирригации Республики Казахстан.

Статистика показывает умеренное присутствие женщин среди персонала водных организаций. По данным Национальной комиссии по делам женщин и семейно-демографической политике, женщины составляют около 17% занятых в сфере сельского, лесного и водного хозяйства (падение с ~36% в 1995 г. до ~17% в 2010-х)[86].

Осознание этой диспропорции привело к активизации усилий по продвижению гендерного равенства в водном управлении как на национальном, так и на региональном уровнях. В последние годы Казахстан присоединился к инициативам, направленным на повышение роли женщин в водном управлении. В 2021 году при поддержке ОБСЕ была создана сеть «Женщины в управлении водными ресурсами», объединяющая специалисток

[85] Роль женщин в решении вопросов мира и безопасности должна быть усилена // Kazpravda.kz. – URL: https://kazpravda.kz/n/rol-zhenshchin-v-reshenii-voprosov-mira-i-bezopasnosti-dolzhna-byt-usilena/ (дата обращения: 23.06.2025).

[86] Kazakhstan. Country Gender Profile // Islamic Development Bank. – URL: https://www.isdb.org/sites/default/files/media/documents/2020-09/Kazakhstan%20Gender.pdf (дата обращения: 23.06.2025).

из Центральной Азии[87]. Казахстанские участницы этой сети (сотрудницы водохозяйственных организаций, исследовательницы) обменивались опытом и продвигали идею более активного вовлечения женщин в принятие решений по воде. Кроме того, в 2023 году в Астане проведён Международный форум «Женщины и вода», на котором обсуждались лучшие практики гендерной интеграции в водный сектор. Поддержку женщин оказывают и проекты ПРООН, Всемирного банка и ЕС, нацеленные на развитие лидерских качеств у женщин-водников и повышение их квалификации[88].

В целом, институционализация гендерного подхода в Казахстане проявляется через наличие политической воли, требований гендерного баланса в кадрах и участие страны в международных сетях.

Образовательная система. Система образования и подготовки кадров для водного сектора в Казахстане представлена профильными вузами (Казахский национальный аграрный университет, Казахско-Немецкий университет и др.) и колледжами. Гендерные компоненты в учебных программах пока развиты слабо. Стандартные программы по гидротехнике, водным ресурсам, экологии не содержат отдельных курсов по гендерной тематике. Тем не менее, благодаря международным партнёрствам некоторые элементы вводятся. Например, Казахско-Немецкий университет (г. Алматы) при поддержке Всемирного банка реализует проект, поддерживающий молодых исследователей (особенно женщин) в области воды и климата[89].

Конкретная статистика по количеству студенток в сфере водного хозяйства в Казахстане не представлена в открытых источниках. Однако, можно сказать, что в Казахстане наблюдается увеличение числа студентов, обучающихся по специальности, связанной с водным хозяйством. Так, в рамках меморандумов между Министерством водных ресурсов и ирригации и вузами страны, количество студентов, проходящих производственную практику в водной сфере, выросло с 80 в прошлом году до 339 в текущем[90].

Исходя из вышеперечисленного, Казахстан обладает прочной нормативной базой гендерного равенства и включён в международные усилия по его продвижению, что создает предпосылки для гендерно чувствительного управления водными ресурсами. Действуют законы и стратегии, провозглашающие равные права, и формальные механизмы (комиссии, уполномоченные) следят за их реализацией. Однако пока отсутствуют

[87] Promoting Women's Participation in Water Resource Management in Central Asia // The World Bank. – URL: https://www.worldbank.org/en/news/feature/2021/01/20/promoting-womens-participation-in-water-resource-management-in-central-asia (дата обращения: 23.06.2025).
[88] Promoting Women's Participation in Water Resource Management in Central Asia // The World Bank. – URL: https://www.worldbank.org/en/news/feature/2021/01/20/promoting-womens-participation-in-water-resource-management-in-central-asia (дата обращения: 23.06.2025).
[89] Promoting Women's Participation in Water Resource Management in Central Asia // The World Bank. – URL: https://www.worldbank.org/en/news/feature/2021/01/20/promoting-womens-participation-in-water-resource-management-in-central-asia (дата обращения: 23.06.2025).
[90] Водная отрасль Казахстана готовит новое поколение специалистов // Vecher.kz. – 12.06.2025. – URL: https://vecher.kz/ru/article/vodnaia-otrasl-kazahstana-gotovit-novoe-pokolenie-spesialistov.html (дата обращения: 23.06.2025)

отдельная гендерная политика, и участие женщин в принятии решений невелико. Институционализация гендерного подхода проявляется скорее в общегосударственных установках, чем в конкретных практиках на уровне водохозяйственных структур.

Кыргызстан

Национальное законодательство. Кыргызская Республика одной из первых в регионе приняла специальный закон о гендерном равенстве. Закон КР от 4 августа 2008 г. № 184 «О государственных гарантиях равных прав и равных возможностей для мужчин и женщин» заложил основы гендерной политики страны. В соответствии с ним женщины и мужчины имеют равные права во всех областях – политической, экономической, социальной, культурной. Закон даёт определение ключевых понятий (гендерное равенство, гендерная дискриминация, гендерная экспертиза и др.). В частности, закреплено проведение гендерной экспертизы законодательства и требований собирать гендерно-разделённую статистику. Также закон предусматривает возможность квот и специальных мер для поддержания сбалансированного представительства мужчин и женщин.

Что касается сектора водных ресурсов, прямых указаний на гендер нет ни в Водном кодексе, ни в Законе «Об объединениях (ассоциациях) водопользователей и союзах ассоциаций водопользователей». Эти акты пользуются гендерно нейтральными категориями – «граждане», «водопользователи», без дифференциации по полу. Однако косвенно гендерные принципы интегрированы. Закон «О государственных гарантиях равных прав и равных возможностей для мужчин и женщин» обязывает все органы власти, включая водохозяйственные, учитывать равные возможности при кадровой политике и предоставлении услуг. Кроме того, в законодательстве есть нормы, влияющие на роль женщин в сельском водном хозяйстве. Например, Закон «О местной государственной администрации и органах местного самоуправления» дает право всем гражданам (в т.ч. женщинам) участвовать в органах самоуправления, через которые часто решаются вопросы доступа к воде на селе. Таким образом, формально-правовая база для гендерного равенства в управлении водными ресурсами в Кыргызстане создана главным образом за счет общих законов о правах женщин, тогда как отраслевые водные законы прямых гендерных положений не содержат.

Институциональные практики. Основными институтами являются Министерство водных ресурсов, сельского хозяйства и перерабатывающей промышленности Кыргызской Республики на национальном уровне и ассоциации водопользователей (АВП) на локальном уровне.

На уровне государства вслед за принятием Закона 2008 г. были созданы механизмы – Национальный совет по вопросам семьи, гендерного развития, социальной защиты и защиты прав детей при Кабинете Министров, отдел гендерной политики и координации защиты от семейного насилия в

структуре Министерства труда, социального обеспечения и миграции. Они проводят гендерный анализ отраслевых стратегий, в том числе по воде.

На местном уровне Кыргызстан известен широким распространением сообществ водопользователей. К началу 2020-х годов в стране зарегистрировано более 400 АВП[91]. Участие женщин в них затруднено традиционным укладом (в сельских общинах решение вопросов воды считалось мужской прерогативой). По оценкам лишь приблизительно 8% членов АВП – женщины[92].

Международные организации также способствуют институционализации гендерного подхода. Так, ОБСЕ разработала руководство по учету гендера в водном управлении Центральной Азии, где опыт Кыргызстана приводится как пример участия женщин в советах водных ресурсов[93]. Кроме того, в рамках проектов UN Women молодежные активисты обучались сотрудничеству с АВП для улучшения водоснабжения с учетом нужд уязвимых женщин[94]. Реализован также проект ПРООН-ООН-Женщины (2015-2017 гг.), направленный на улучшение доступа к поливной воде для уязвимых семей и одновременно на наращивание потенциала женщин в местных сообществах[95].

Кыргызстан также предпринимает шаги на политическом уровне. Региональные администрации начали учитывать гендерные индикаторы при реализации программ водоснабжения. Например, при строительстве новых объектов сельхозводоснабжения требуют консультаций с группами женщин-пользователей (чтобы учесть их потребности – расположение колодцев, расписание подачи воды и т.д.). Подобные практики согласуются с национальной стратегией гендерного равенства, требующей, чтобы женщины были полноценно вовлечены во все уровни принятия решений[96].

Образовательная система. Подготовка специалистов водного профиля в Кыргызстане сосредоточена в Кыргызском национальном аграрном университете им. Скрябина, Кыргызском государственном техническом университете и ряде технических колледжей. В учебных программах этих учреждений гендерные вопросы не выделены отдельно. Обучение строится по классическим техническим стандартам: гидрология, гидротехника,

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[91] С 2000 года в стране создано 496 АВП, но каналы лишь 136 АВП реабилитированы благодаря донорам, - Госагентство водных ресурсов // Tazabek.kg. – URL: https://www.tazabek.kg/news:1702048/

[92] Оценка деятельности АВП с точки зрения гендера // Experts.kg. – URL: https://experts.kg/?p=3602

[93] Gender and Water Governance in Central Asia: A Synthesis Report // OSCE. – URL: https://www.osce.org/files/f/documents/3/b/465531.pdf (дата обращения: 23.06.2025).

[94] Women in Rural Kyrgyzstan Bring Change through Water and Infrastructure // UN Women Europe and Central Asia. – URL: https://eca.unwomen.org/en/news/stories/2019/03/feature-story-women-in-rural-kyrgyzstan-bring-change-through-water-and-infrastructure (дата обращения: 23.06.2025).

[95] UN Women: Improved Access to Irrigation Water for Over 20,000 Water Users, Including Over 3,000 Vulnerable Groups // UN Kyrgyzstan. – URL: https://kyrgyzstan.un.org/en/13372-un-women-improved-access-irrigation-water-over-20000-water-users-over-3000-vulnerable-groups (дата обращения: 23.06.2025).

[96] Интеграция гендерных аспектов в НАП Кыргызской Республики // UNDP. – URL: https://www.undp.org/sites/g/files/zskgke326/files/2025-01/integraciya_gendernykh_aspektov_v_nap_v_kyrgyzskoy_respublike.pdf (дата обращения: 23.06.2025).

эксплуатация ирригационных систем, инженерные сети – без рассмотрения социально-гендерных аспектов управления ресурсами.

Однако вне формальных программ проявляется интерес к теме «женщины и вода». В последние годы кыргызские вузы участвуют в региональных проектах по обмену опытом. Студенты из КНАУ и КГТУ участвовали в конференциях «Women and Water» (организованных CAWEP и Казахско-Немецким университетом)[97]. Такие мероприятия дают знания о гендерной проблематике воды, хотя и не входят в официальные учебные планы.

Доля женщин среди учащихся на водных и инженерных специальностях относительно невелика. Согласно данным 2018 года, только 31,1% выпускников STEM-специальностей в Кыргызстане – женщины[98]. В технических вузах страны примерно каждая третья студентка выбирает инженерно-технические дисциплины, а среди водных инженерных – возможно еще меньше из-за устоявшихся стереотипов. Таким образом, гендерный дисбаланс в профильном образовании остается значительным.

Таким образом, Кыргызстан обладает прогрессивной нормативной базой и опытом общественного участия, что помогает внедрению гендерного подхода в водном управлении, однако реальные результаты пока ограничены. Закон 2008 г. обеспечил юридические гарантии равенства полов, а наличие множества Ассоциаций водопользователей создало возможности для вовлечения женщин на местном уровне. В тех случаях, где женщины возглавили фермерские хозяйства или местные органы, они начинают влиять и на распределение воды. Донорские проекты и НПО вносят вклад, обучая женщин и стимулируя их участие[99]. Тем не менее, институционально гендерный подход пока слаб: в государственных водных органах нет специализированных гендерных отделов, данные о женском участии в управлении скудны, и стереотипы сохраняются.

Таджикистан

Национальное законодательство. Таджикистан закрепил принципы гендерного равенства в законодательстве еще в 2000-х годах. Основополагающим актом является Закон РТ «О государственных гарантиях равноправия мужчин и женщин и равных возможностей их реализации» (принят в декабре 2005 г., с поправками в 2017 г.). Этот закон провозглашает равные права мужчин и женщин во всех сферах, запрещает дискриминацию по признаку пола и обязывает органы власти принимать временные

[97] Promoting Women's Participation in Water Resource Management in Central Asia // The World Bank. – URL: https://www.worldbank.org/en/news/feature/2021/01/20/promoting-womens-participation-in-water-resource-management-in-central-asia (дата обращения: 23.06.2025).

[98] UNDP Kyrgyzstan Empowers Women in STEM to Excel in the Future of Work // UNDP. –URL: https://www.undp.org/kyrgyzstan/blog/undp-kyrgyzstan-empowers-women-stem-excel-future-work (дата обращения: 23.06.2025).

[99] UN Women: Improved Access to Irrigation Water for Over 20,000 Water Users, Including Over 3,000 Vulnerable Groups // UN Kyrgyzstan. – URL: https://kyrgyzstan.un.org/en/13372-un-women-improved-access-irrigation-water-over-20000-water-users-over-3000-vulnerable-groups (дата обращения: 23.06.2025).

специальные меры для достижения фактического равенства. Он схож по содержанию с аналогичными законами соседних стран: вводит понятия гендерной политики, гендерной экспертизы, гендерной статистики, возлагает на правительство разработку национальных гендерных программ. В развитие закона была утверждена Национальная стратегия активизации роли женщин на 2021–2030 годы.

Водный кодекс Таджикистана не содержит прямых норм о гендере. Кодекс регулирует права и обязанности граждан независимо от пола. Однако следует отметить Закон РТ «Об ассоциации водопользователей», который закрепляет принцип добровольности членства АВП, а также равноправия членов что подразумевает отсутствие формальных барьеров для женщин вступать в такие объединения и занимать в них должности. Таким образом, возможности женщин-фермеров участвовать в управлении водой формально защищены. Проблема в том, что традиционно мало женщин выступало учредителями и руководителями АВП – это не вопрос закона, а вопрос практики и социокультурных установок.

Институциональные практики. Система управления водными ресурсами Таджикистана сочетает государственное руководство и элементы участия пользователей. На государственном уровне функцию управления водой выполняет Министерство энергетики и водных ресурсов.

Правительство уделяет внимание гендерному балансу. В частности, действует Комитет по делам женщин и семьи при Правительстве, который координирует женские советы во всех министерствах. Этот Комитет, в частности, осуществляет мониторинг исполнения Национальной стратегии активизации роли женщин, где есть разделы по вовлечению женщин в экономику и управление природными ресурсами.

В Таджикистане также активно создавались ассоциации (сообщества) водопользователей для управления ирригацией на местах. В 2017 г. насчитывалось около 400 АВП[100]. Первоначально подавляющее большинство их членов и лидеров были мужчины (в 2012 г. порядка 98% глав дехканских хозяйств – мужчин)[101]. Однако вследствие оттока мужского населения на заработки произошла «феминизация» сельского хозяйства: женщины все чаще становятся руководителями дехканских хозяйств (по оценкам, уже ~25% хозяйств возглавляются женщинами)[102]. Это постепенно отражается и в АВП. По данным Международного института управления водными ресурсами (IWMI), доля женщин среди зарегистрированных водопользователей выросла

[100] Ассоциации водопользователей в Таджикистане: проблем больше чем возможностей [Электронный ресурс] // Toptj.com – URL: https://toptj.com/News/2017/09/08/associacii-vodopolzovateley-v-tadzhikistane-problem-bolshe-chem-vozmozhnostey (дата обращения: 23.06.2025).

[101] Why Women Are Key for Water Management in Tajikistan // Farming First. – URL: https://farmingfirst.org/2018/07/why-women-are-key-for-water-management-in-tajikistan/ (дата обращения: 23.06.2025).

[102] Why Women Are Key for Water Management in Tajikistan // Farming First. – URL: https://farmingfirst.org/2018/07/why-women-are-key-for-water-management-in-tajikistan/ (дата обращения: 23.06.2025).

до 25%[103]. Тем не менее, среди руководителей АВП женщины по-прежнему единицы. Исследование 2017 г. показало, что только 13 женщин возглавляют АВП по всей стране[104].

Связано это с тем, что, даже став главами фермерских хозяйств, женщины не всегда участвуют в собраниях АВП и не избираются председателями. Причины – и культурные барьеры, и практические (нехватка времени, уверенности). Согласно тому же исследованию IWMI, женщины-руководители хозяйств на 11% реже подписывают контракты с АВП и на 3% реже посещают собрания[105]. Это приводит к тому, что их интересы учитываются хуже: например, заявки на воду подаются не в полном объеме, что сказывается на водообеспечении их участков[106].

Осознавая проблему, донорские проекты активно обучают женщин специалистов по воде. USAID в рамках проектов по развитию сельского хозяйства организовывал тренинги для женщин-фермеров по участию в АВП, уплате взносов и ремонту каналов[107]. Появляются истории успеха: Абдуллоева Угулой, одна из немногих женщин-председателей АВП, добилась эффективной работы своей организации и публично выступает за вовлечение больше числа женщин[108]. Она отмечает, что 90% проблем с водой затрагивают прежде всего женщин, поэтому их голос крайне важен[109]. Такие примеры используются для популяризации.

В правительстве Таджикистана признают необходимость усиления гендерного компонента. В Национальном обзоре страны по выполнению Пекинской декларации и платформы действий отмечено слабое внедрение гендерных подходов в отраслевое законодательство[110].

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[103] Why Women Are Key for Water Management in Tajikistan // Farming First. – URL: https://farmingfirst.org/2018/07/why-women-are-key-for-water-management-in-tajikistan/ (дата обращения: 23.06.2025).

[104] Why Women Are Key for Water Management in Tajikistan // Farming First. – URL: https://farmingfirst.org/2018/07/why-women-are-key-for-water-management-in-tajikistan/ (дата обращения: 23.06.2025).

[105] Why Women Are Key for Water Management in Tajikistan // Farming First. – URL: https://farmingfirst.org/2018/07/why-women-are-key-for-water-management-in-tajikistan/ (дата обращения: 23.06.2025).

[106] Why Women Are Key for Water Management in Tajikistan // Farming First. – URL: https://farmingfirst.org/2018/07/why-women-are-key-for-water-management-in-tajikistan/ (дата обращения: 23.06.2025).

[107] Why Women Are Key for Water Management in Tajikistan // Farming First. – URL: https://farmingfirst.org/2018/07/why-women-are-key-for-water-management-in-tajikistan/ (дата обращения: 23.06.2025).

[108] Why Women Are Key for Water Management in Tajikistan // Farming First. – URL: https://farmingfirst.org/2018/07/why-women-are-key-for-water-management-in-tajikistan/ (дата обращения: 23.06.2025).

[109] Why Women Are Key for Water Management in Tajikistan // Farming First. – URL: https://farmingfirst.org/2018/07/why-women-are-key-for-water-management-in-tajikistan/ (дата обращения: 23.06.2025).

[110] Национальный обзор Республики Таджикистан по осуществлению Пекинской декларации и платформы действий (1995 года) // UN Women. – URL: https://www.unwomen.org/sites/default/files/Headquarters/Attachments/Sections/CSW/64/National-reviews/Tajikistan.pdf (дата обращения: 23.06.2025).

Отдельно стоит отметить усилия Таджикистана на мировой арене: страна является инициатором Международной декады действий «Вода для устойчивого развития» (2018-2028) и регулярно проводит международные конференции по воде, где неизменно затрагивается и гендерная тематика. Это отражает политическую волю интегрировать гендерный компонент в водный дискурс.

Кроме того, в рамках реализации Декады «Вода для устойчивого развития» ежегодно проводятся международные конференции, на которых одна из сквозных тем – гендерное равенство. Например, в июне 2022 года в Душанбе прошёл Форум «Женщины и вода», собравший сотни участниц из разных стран для обмена опытом и предложения новых решений[111]. Там отмечалось, что по данным Всемирного банка женщины составляют менее 20% работников водного сектора региона и что без увеличения этого показателя сложно достигнуть устойчивого водопользования[112].

Образовательная система. Подготовка кадров для водного и ирригационного хозяйства в Таджикистане сосредоточена в Таджикском аграрном университете (факультет гидромелиорации) и Российско-Таджикском славянском университете (технические направления). Гендерный аспект не включен явно в учебные планы этих учреждений. Обучение носит инженерно-технический характер.

В последнее десятилетие предпринимаются шаги по привлечению девушек в инженерные вузы. В 2020 году ЮНИСЕФ запустил программу «Девушки в науке», призванную помочь девушкам расширить свой профессиональный кругозор, преодолеть гендерные стереотипы и определиться с выбором профессии[113].

Таким образом, Таджикистан сталкивается с гендерными вызовами в водном секторе, несмотря на наличие базового законодательства о равенстве. Основной прогресс достигнут снизу – через изменение структуры сельского населения: женщины вынужденно берут на себя функции по управлению фермами и участию в АВП из-за мужской миграции[114]. Однако без поддержки и обучения это не приводит автоматически к усилению их голоса – данные

[111] Международный форум «Женщины и вода» – Отчёт // UN Women, Региональный офис Европа и Центральная Азия. – URL: https://eca.unwomen.org/sites/default/files/2022-07/Women%20Water%20Forum%20Report_RUS.pdf (дата обращения: 23.06.2025).

[112] Душанбинский форум «Женщины и вода»: мобилизация усилий для обеспечения водной безопасности // Asia-Plus. – URL: https://asiaplustj.info/ru/news/tajikistan/society/20240611/dushanbinskii-forum-zhentshini-i-voda-mobilizatsiya-usilii-dlya-obespecheniya-vodnoi-bezopasnosti (дата обращения: 23.06.2025).

[113] По всей Центральной Азии девочки и девушки задают тон в сфере НТИМ // UNICEF. – URL: https://www.unicef.org/eca/ru/Новостные-заметки/по-всей-центральной-азии-девочки-и-девушки-задают-тон-в-сфере-нтим (дата обращения: 23.06.2025).

[114] Why Women Are Key for Water Management in Tajikistan // Farming First. – URL: https://farmingfirst.org/2018/07/why-women-are-key-for-water-management-in-tajikistan/ (дата обращения: 23.06.2025).

показывают слабое участие женщин в процессах принятия решений АВП (низкая явка на собрания, меньшая склонность требовать свои права)[115].

Туркменистан

Национальное законодательство. Туркменистан декларирует приверженность принципам равноправия мужчин и женщин в своих законах и стратегиях. Был принят Закон Туркменистана № 264-V от 18 августа 2015 г. «О государственных гарантиях обеспечения равных прав и равных возможностей женщин и мужчин». Этот закон закрепляет цели государственной гендерной политики, определяет основные понятия и направления – от равного доступа к труду и политическому участию до предупреждения семейного насилия.

Фактически закон 2015 г. развивает положения более раннего закона 2007 г. о гарантиях прав женщин[116], расширяя их до концепции равных возможностей для обоих полов. Также в январе 2015 г. был утвержден первый Национальный план действий по гендерному равенству на 2015–2020 гг.[117], в котором одна из задач – поддержка и увеличение представительства женщин и девушек в нетрадиционных областях обучения, таких как наука, технологии, инженерия и математика[118].

Отдельного упоминания о водных ресурсах или сельском хозяйстве в этих гендерных законах нет – они имеют всеобъемлющий характер. Водный кодекс Туркменистана не содержит норм, затрагивающих конкретно женщин. Гендерные принципы включены косвенно: общие положения Конституции и закона 2015 г. распространяются и на водный сектор, но каких-либо специальных норм или поправок, вводящих гендерное равенство именно в управление водным хозяйством, в Туркменистане не зафиксировано (по открытой информации).

Институциональные практики. Информация о практиках учета гендерных аспектов в институтах водного хозяйства Туркменистана ограничена. Тем не менее, некоторые выводы можно сделать на основе доступных официальных данных и общих тенденций. Женщины в Туркменистане составляют почти половину рабочей силы – около 46% работников всех учреждений и предприятий по стране[119]. Государство

[115] Why Women Are Key for Water Management in Tajikistan // Farming First. – URL: https://farmingfirst.org/2018/07/why-women-are-key-for-water-management-in-tajikistan/ (дата обращения: 23.06.2025).

[116] Achievement of the gender equality - one of the priorities of the development of Turkmenistan // Ministry of Foreign Affairs of Turkmenistan. – URL: https://www.mfa.gov.tm/en/articles/50 (дата обращения: 23.06.2025).

[117] Achievement of the gender equality - one of the priorities of the development of Turkmenistan // Ministry of Foreign Affairs of Turkmenistan. – URL: https://www.mfa.gov.tm/en/articles/50 (дата обращения: 23.06.2025).

[118] Атаева М., Чарыева О., Джумаева Дж. Национальный план действий по гендерному равенству в Туркменистане на 2021-2025 годы и стимулы для увеличения представленности женщин и девушек в нетрадиционных областях обучения и карьеры, таких как наука, технология, инженерное дело и математика, посредством дополнительных временных специальных мер // Символ науки. 2024. №3-1-2.

[119] Achievement of the gender equality - one of the priorities of the development of Turkmenistan // Ministry of Foreign Affairs of Turkmenistan. – URL: https://www.mfa.gov.tm/en/articles/50 (дата обращения: 23.06.2025).

заявляет, что женщины представлены во всех секторах, включая управление[120].

В 2023 году в Туркменистане стартовала программа «Привлечение мужчин в продвижение гендерного равенства». Целью программы является проведение серии тренингов по гендерному равенству для молодых ребят в возрасте от 15 до 35 лет[121]. Однако специальных программ или проектов, нацеленных на гендерное равенство в водном секторе, внутри страны не анонсировано. Министерство сельского хозяйства и охраны окружающей среды (куда входит и водный сектор) формально должно исполнять закон о равных возможностях, например, придерживаться принципа недискриминации при найме.

Положительным моментом является высокий уровень женской грамотности и образования – почти 100% женщин грамотны[122]. Государство подчеркивает, что у женщин есть равный доступ ко всем профессиям. Это значит, что формальных препятствий для работы женщин в области водного хозяйства нет.

Образовательная система. Основной кузницей инженеров-водников является Туркменский сельскохозяйственный университет имени С.А.Ниязова (г. Ашхабад). Точных цифр о количестве обучающихся женщин нет в открытом доступе. Специальных дисциплин, посвященных гендерным вопросам, в программах технических вузов нет. Тем не менее, женские выпускницы технических специальностей, получая диплом, формально имеют те же возможности трудоустройства.

Подводя итог, можно констатировать, что несмотря на наличие прогрессивных законов и заявлений о том, что достижение гендерного равенства – приоритет развития[123], практическая реализация в секторе водного хозяйства остается неясной.

Узбекистан

Национальное законодательство. В Республике Узбекистан за последнее десятилетие принят ряд законов, укрепляющих основу гендерного равенства. Ключевым актом является Закон Республики Узбекистан № ЗРУ-562 от 2 сентября 2019 года «О гарантиях равных прав и возможностей для женщин и мужчин». Закон закрепляет принцип равноправия полов, запрещает дискриминацию по признаку пола и обязывает государственные органы учитывать гендерный фактор во всех сферах. Закон вводит механизмы гендерной экспертизы нормативных актов и формирования гендерной

[120] Туркменская делегация представила доклад в Комитет ООН по ликвидации дискриминации в отношении женщин // News Central Asia. – URL: www.newscentralasia.net/2024/02/05/turkmenskaya-delegaciya-predstavila-doklad-v-komitet-oon-po-likvidacii-diskriminacii-v-otnoshenii-zhenshchin/ (дата обращения: 23.06.2025).

[121] Развивая равенство: как тренинги по гендерному равенству меняют мир вокруг нас // UNFPA Туркменистан. – URL: https://turkmenistan.unfpa.org/ru/news/развивая-равенство-как-тренинги-по-гендерному-равенству-меняют-мир-вокруг-нас (дата обращения: 23.06.2025).

[122] Туркменистан: Уровень грамотности женщин 15-24 лет // The Global Economy. – URL: https://ru.theglobaleconomy.com/Turkmenistan/Female_literacy_rate_15_25 (дата обращения: 23.06.2025).

[123] Achievement of the gender equality - one of the priorities of the development of Turkmenistan // Ministry of Foreign Affairs of Turkmenistan. – URL: https://www.mfa.gov.tm/en/articles/50 (дата обращения: 23.06.2025).

статистики, обеспечивая интеграцию принципов равенства в политику и законотворчество. Кроме того, была принята Стратегия достижения гендерного равенства в Узбекистане до 2030 года, направленная на обеспечение равных прав и возможностей для женщин и мужчин в социальной, экономической и политической сферах.

Специальное водное законодательство прямо не содержит гендерных норм. Основные задачи водного законодательства Узбекистана сформулированы в гендерно нейтральных терминах (водопользователь, водопотребитель и пр.). Однако общий запрет дискриминации и требования равных прав, закрепленные в Законе «О гарантиях равных прав и возможностей для женщин и мужчин», применимы ко всем отраслям, в том числе к водному хозяйству. Таким образом, гендерные принципы в водном секторе Узбекистана институционально обеспечены скорее косвенно, через общенациональные нормы равенства, обязательность гендерной экспертизы проектов законов и сбор гендерно-дезагрегированной статистики.

В связи с этим в Узбекистане разработали Гендерную концепцию водного хозяйства на 2025-2030 годы[124], призванную интегрировать вопросы равных прав и возможностей в политику водного сектора. На проводимых обсуждениях подчеркивалась необходимость более широкого участия женщин и усиления их роли в управлении водными ресурсами[125].

Институциональные практики. С 2019 года в составе правительства Узбекистана действует Комитет по делам семьи и женщин, а при Сенате – Комиссия по вопросам гендерного равенства. Они координируют гендерную политику и следят за выполнением законов о равных возможностях, что затрагивает и водохозяйственные органы.

Министерство водного хозяйства Республики Узбекистан предпринимает шаги по внедрению гендерного подхода. В 2021 году при поддержке доноров было проведено всестороннее гендерное оценивание водного сектора, которое выявило барьеры и возможности для участия женщин[126].

Статистические данные свидетельствуют, что женщины присутствуют на различных уровнях управления водой, но их доля пока невелика. По официальным данным, женщины составляют лишь около 7% работников водного сектора страны[127]. Для сравнения, в традиционно «социальных» отраслях доля женщин намного выше (например, в образовании – 72,7%, в

[124] Расширенное заседание гендерного совета министерства водного хозяйства с участием рабочей группы по разработке гендерной концепции и партнерских организаций по развитию // НИЦ МКВК. – URL: http://sic.icwc-aral.uz/releases/rus/561.htm (дата обращения: 23.06.2025).
[125] Uzbekistan's 2030 gender strategy for water management and equality // WE-ACT Project. – URL: https://weact-project.eu/uzbekistans-2030-gender-strategy-for-water-management-and-equality/ (дата обращения: 23.06.2025).
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[127] Гендерная концепция водного хозяйства Республики Узбекистан на 2025-2030 годы

здравоохранении и социальном обслуживании – 76,7%)[128]. Даже в сфере водоснабжения, канализации, сбора и утилизации отходов, ближе связанной с обслуживанием домохозяйств, женщины занимают только около 19,4% рабочих мест[129]. Такой низкий показатель в водном хозяйстве отчасти обусловлен тем, что инженерно-технические специальности долгие годы считались мужской областью.

Тем не менее, определённые сдвиги в сторону гендерного равенства наблюдаются благодаря целенаправленным усилиям, таким как проекты Азиатского банка развития (АБР) в сфере водоснабжения, которые способствуют расширению прав и возможностей женщин в сельских сообществах. Например, доля женщин, состоящих в ассоциациях водопользователей (АВП), выросла с 3,5% до 7,6% (22 женщины в 2015 году против 5 сотрудниц в 2013 г.); количество женщин, состоящих в органах управления АВП, выросло на 50% в 2015 году по сравнению с 2014 годом[130].

Таким образом, институциональная база для учета гендерных аспектов в управлении водными ресурсами формируется через национальные механизмы по делам женщин и конкретные мероприятия Министерства водного хозяйства. Несмотря на наличие специализированных государственных структур и усилия по внедрению гендерного подхода в водном секторе Узбекистана, участие женщин в этой сфере остаётся крайне низким.

Образовательная система. Подготовка кадров для водного сектора Узбекистана традиционно велась техническими вузами (например, Ташкентским институтом инженеров ирригации и механизации сельского хозяйства). В этих учебных программах долгие годы гендерная тематика не была явно представлена. Курсы фокусировались на инженерных дисциплинах – гидротехнике, мелиорации, управлении водными ресурсами – без специального компонента по социально-гендерным вопросам. Однако в последнее время наблюдаются сдвиги под влиянием международных проектов. В Узбекистане, как и по региону в целом, появляются программы краткосрочного обучения, семинары и летние школы, где обсуждаются вопросы участия женщин в водном управлении и учитываются гендерные аспекты[131]. Например, в рамках Центральноазиатской сети знаний по воде и энергии (CAWEP) при сотрудничестве с университетами реализуются проекты, поддерживающие молодых исследовательниц, изучающих водный

[128] Агентство статистики при Президенте Республики Узбекистан URL: https://gender.stat.uz/ru/osnovnye-pokazateli/trud

[129] Агентство статистики при Президенте Республики Узбекистан URL: https://gender.stat.uz/ru/osnovnye-pokazateli/trud

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[131] Promoting Women's Participation in Water Resource Management in Central Asia // The World Bank. – URL: https://www.worldbank.org/en/news/feature/2021/01/20/promoting-womens-participation-in-water-resource-management-in-central-asia (дата обращения: 23.06.2025).

сектор с гендерной перспективой[132]. Тем не менее, систематического включения гендерных дисциплин в базовые учебные планы водных специальностей пока нет.

Статистика высшего образования отражает общие дисбалансы: девушки составляют меньшинство среди студентов инженерно-водного профиля. По оценкам на 2020 год, в инженерных направлениях вузов Узбекистана женская доля была около 30%[133].

Таким образом, Узбекистан демонстрирует движение к институционализации гендерного подхода в водном хозяйстве. Наличие специального закона о гендерном равенстве и национальных механизмов создает прочую нормативную основу для равных прав в любой отрасли. Хотя профильные водные законы прямо не учитывают гендер, де-факто гендерные принципы внедряются через общегосударственные нормы и инициативы Министерства водного хозяйства.

Заключение.

Проведённый анализ показал, что во всех пяти странах Центральной Азии гендерная проблематика постепенно занимает всё более значимое место в повестке дня водного управления. На уровне законодательства сформированы базовые гарантии равенства женщин и мужчин, в том числе с учётом международных обязательств. Тем не менее, водное право по-прежнему в большинстве случаев сохраняет гендерно-нейтральный характер, не закрепляя напрямую обязательства по инклюзивному участию женщин в управлении водными ресурсами.

Институциональные практики демонстрируют ограниченное вовлечение женщин в принятие решений и управление в водном секторе. В среднем доля женщин среди работников водного хозяйства в регионе менее 20%, и только 3% из лицензированных инженеров и менеджеров являются женщинами[134]. Статистические данные указывают на структурный дисбаланс, обусловленный одновременно профессиональной сегрегацией, устоявшимися стереотипами и недостаточной поддержкой на уровне кадровой политики.

Ситуация в сфере образования напрямую влияет на воспроизводство гендерного дисбаланса: инженерные и агротехнические направления, связанные с водным управлением, продолжают оставаться мужскими доменами. Женщины составляют меньшинство среди студентов профильных вузов, а гендерные компоненты в учебных программах, как правило, отсутствуют или реализуются в рамках отдельных международных проектов.

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[132] Promoting Women's Participation in Water Resource Management in Central Asia // The World Bank. – URL: https://www.worldbank.org/en/news/feature/2021/01/20/promoting-womens-participation-in-water-resource-management-in-central-asia (дата обращения: 23.06.2025).

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[134] Душанбинский форум «Женщины и вода»: мобилизация усилий для обеспечения водной безопасности // Central Asia Climate Portal. – 2024. – URL: https://centralasiaclimateportal.org/ru/душанбинский-форум-женщины-и-вода-м (дата обращения: 23.06.2025).

Это ограничивает возможности формирования устойчивого кадрового потенциала с учётом принципов равенства.

В совокупности, полученные данные позволяют сделать несколько выводов. Во-первых, несмотря на наличие нормативных основ, в Центральной Азии пока не сформирован устойчивый институциональный механизм, обеспечивающий гендерно-чувствительное управление водными ресурсами. Во-вторых, реализация национальных стратегий по гендерному равенству требует трансляции в специализированные сектора, включая водное хозяйство, что предполагает необходимость межведомственной координации, целевых программ и мониторинга. В-третьих, долгосрочное изменение возможно только при условии структурных реформ в образовательной сфере, направленных на снижение гендерной сегрегации в подготовке специалистов и развитие лидерского потенциала женщин в технических профессиях.

Таким образом, регион стоит перед необходимостью перехода от декларативного уровня к устойчивой практике гендерной интеграции в водное управление. Это не только соответствует требованиям Целей устойчивого развития, но и служит фактором повышения управленческой эффективности, социальной справедливости и устойчивости водных систем. Гендерно-чувствительный подход к водному управлению должен стать неотъемлемой частью модернизации водного сектора в Центральной Азии.

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ЭФФЕКТИВНЫЕ СТРАТЕГИИ ДЛЯ ПОДДЕРЖАНИЯ ПРОДУКТИВНОСТИ И МОТИВАЦИИ СОТРУДНИКОВ

Аннотация: *Эффективные стратегии для поддержания продуктивности и мотивации сотрудников" в настоящее время обусловлена ростом удаленной работы, который начался с пандемии COVID-19 и продолжается в условиях гибридных моделей. Изменение культурных норм требует от менеджеров адаптации подходов к управлению, поскольку сотрудники ожидают большей гибкости и возможности работать из любого места. Технологические достижения, такие как видеоконференции и инструменты для совместной работы, открывают новые возможности для взаимодействия, но также создают вызовы в поддержании командной динамики.*

Ключевые слова: *удаленная работа, продуктивность, мотивация сотрудников, командная динамика, эмоциональное благополучие, технологические инструменты, совместная работа, чувство изоляции, корпоративная культура, оценка производительности, привлечение талантов, удержание сотрудников, стратегии управления.*

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EFFECTIVE STRATEGIES FOR MAINTAINING EMPLOYEE PRODUCTIVITY AND MOTIVATION

Abstract: *The topic of "Effective Strategies for Maintaining Employee Productivity and Motivation" has gained increasing relevance in light of the growth of remote work, which began during the COVID-19 pandemic and continues under hybrid models. Changing cultural norms require managers to adapt their leadership approaches, as employees now expect more flexibility and the ability to work from anywhere. Technological advancements, such as video conferencing and*

collaboration tools, open up new opportunities for interaction but also pose challenges in maintaining team dynamics.

Keywords: *Remote work, productivity, employee motivation, team dynamics, emotional well-being, technological tools, collaboration, sense of isolation, corporate culture, performance evaluation, talent acquisition, employee retention, management strategies.*

Обеспечение продуктивности и мотивации сотрудников на удаленной работе требует комплексного подхода, учитывающего как индивидуальные, так и командные аспекты. Важно создать четкую структуру и систему коммуникации, чтобы сотрудники ощущали поддержку и вовлеченность. Регулярные видеозвонки и виртуальные встречи помогают поддерживать командный дух и обмен информацией, что способствует созданию ощущения единства.

Для повышения мотивации стоит внедрять гибкий график работы, позволяющий сотрудникам адаптировать рабочие часы под свои личные нужды, что способствует лучшему балансу между работой и личной жизнью. Также важно устанавливать четкие цели и задачи, чтобы каждый член команды понимал свои приоритеты и чувствовал свою значимость в общем процессе. Периодическое признание достижений сотрудников, будь то через онлайн-мероприятия или простые слова благодарности, помогает укрепить моральный дух и повысить удовлетворенность работой.

Установление четких целей и ожиданий является ключевым аспектом управления производительностью и мотивацией сотрудников. Для этого можно использовать методику SMART, которая помогает формулировать конкретные, измеримые, достижимые, актуальные и ограниченные по времени цели. Важно ставить как индивидуальные, так и командные цели, чтобы сотрудники понимали, как их работа влияет на общие результаты. Регулярные встречи для обсуждения прогресса позволяют вносить изменения в задачи и корректировать курс при необходимости. Прозрачность ожиданий также играет важную роль; четкое объяснение того, что именно ожидается от сотрудников, включая результаты работы и поведение, помогает избежать недопонимания. Документирование целей позволяет сотрудникам к ним обращаться, а регулярная обратная связь помогает понять, где они успешны, а где нужно улучшение. Вовлечение сотрудников в процесс постановки целей повышает их мотивацию и ответственность.

Установление индивидуальных и командных целей является важным аспектом повышения продуктивности и мотивации персонала. Индивидуальные цели помогают сотрудникам сосредоточиться на своих личных задачах и развивать профессиональные навыки, что способствует их карьерному росту. Эти цели должны быть конкретными, измеримыми, достижимыми, актуальными и ограниченными по времени (метод SMART). Например, сотрудник может поставить цель увеличить свои продажи на 20% в течение квартала.

Командные цели, в свою очередь, способствуют сплочению коллектива и улучшению взаимодействия между членами команды. Они направлены на достижение общих результатов, что создает чувство единства и ответственности за успехи всей группы. Командные цели могут включать завершение проекта в определенные сроки или достижение определенного уровня удовлетворенности клиентов.

Сочетание индивидуальных и командных целей позволяет создать гармоничную рабочую среду, где каждый сотрудник понимает свою роль и вклад в общий успех. Регулярная обратная связь, поддержка со стороны руководства и признание достижений играют ключевую роль в поддержании мотивации и вовлеченности сотрудников. Важно также вовлекать сотрудников в процесс постановки целей, чтобы они чувствовали свою значимость и ответственность за результаты работы. Таким образом, четко сформулированные цели помогают не только повысить продуктивность, но и создать положительную атмосферу внутри коллектива.

Когда сотрудники чувствуют себя вовлеченными, они более заинтересованы в своей работе, что приводит к улучшению качества выполнения задач и повышению общей эффективности команды. Вовлеченность способствует созданию позитивной рабочей атмосферы, где сотрудники готовы делиться идеями, активно участвовать в обсуждениях и стремиться к общим целям.

Для достижения высокой вовлеченности важно обеспечить открытое общение, признание достижений и возможности для профессионального роста. Регулярная обратная связь помогает сотрудникам понимать, как их работа влияет на общий успех компании. Кроме того, вовлечение сотрудников в процесс принятия решений и постановки целей создает чувство ответственности и принадлежности к команде.

Когда сотрудники видят, что их мнение ценится, а их усилия отмечаются, это стимулирует их к еще более высокой производительности. В итоге, высокий уровень вовлеченности не только повышает мотивацию, но и способствует снижению текучести кадров и улучшению результатов бизнеса в целом. Празднование достижений, как больших, так и малых, создает атмосферу признания и поддержки. Это помогает сотрудникам чувствовать свою значимость и ценность для команды, что, в свою очередь, повышает их мотивацию. Когда достижения отмечаются, будь то успешное завершение проекта или выполнение квартальных целей, это укрепляет командный дух и способствует созданию позитивной рабочей среды.

Адаптация к изменениям также играет ключевую роль в поддержании продуктивности. В быстро меняющемся мире способность гибко реагировать на новые условия и вызовы становится необходимостью. Когда организация активно поддерживает сотрудников в процессе изменений — предоставляет обучение, ресурсы и открытое общение — это снижает уровень стресса и неопределенности. Сотрудники, уверенные в своих силах и готовые к изменениям, более продуктивны и вовлечены в рабочие процессы. Таким

образом, сочетание празднования достижений и активной поддержки адаптации к изменениям создает мощный стимул для повышения мотивации и продуктивности команды. Это способствует не только росту индивидуальных результатов, но и общему успеху организации.

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УПРАВЛЕНИЕ ПРОЕКТАМИ В УСЛОВИЯХ МНОГОЗАДАЧНОСТИ И ОГРАНИЧЕННЫХ РЕСУРСОВ

Аннотация: *Современные организации всё чаще сталкиваются с необходимостью реализовывать несколько проектов одновременно в условиях дефицита времени, ресурсов и кадров. Такая многозадачность ставит перед руководителями проектов вызов: как обеспечить выполнение задач в срок, не теряя качества и управляемости. В данной статье рассматриваются ключевые проблемы управления проектами в условиях ограниченности ресурсов, а также эффективные подходы и инструменты, позволяющие справляться с параллельными проектами. Анализируется роль приоритезации, гибкого управления и командной координации как основополагающих факторов успешной реализации проектов. Статья предназначена для практикующих менеджеров, руководителей команд и специалистов, участвующих в проектной деятельности в условиях ограничений.*

Ключевые слова: *Управление проектами, многозадачность, ограниченные ресурсы, приоритеты, проектный менеджмент, дефицит времени, гибкое управление, Scrum, командная работа, эффективность.*

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PROJECT MANAGEMENT UNDER CONDITIONS OF MULTITASKING AND LIMITED RESOURCES

Abstract: *Modern organizations increasingly face the need to implement multiple projects simultaneously under conditions of limited time, resources, and personnel. Such multitasking presents a significant challenge for project managers: how to ensure tasks are completed on time without compromising quality or control. This article examines the key issues of project management under resource*

constraints, as well as effective approaches and tools for handling parallel projects. The importance of prioritization, agile management, and team coordination is analyzed as fundamental factors for successful project implementation. The article is intended for practicing managers, team leaders, and professionals involved in project activities under constraints.

Keywords: *Project management, multitasking, limited resources, priorities, project leadership, time constraints, agile management, Scrum, teamwork, efficiency.*

В условиях высококонкурентной бизнес-среды проектный подход становится основной моделью реализации стратегических и операционных целей организаций. Однако с ростом числа проектов, ускорением темпов изменений и ограниченностью ресурсов (временных, финансовых, человеческих) компании всё чаще сталкиваются с необходимостью управлять несколькими проектами одновременно. Это создаёт среду повышенной сложности, где успешность зависит не только от инструментов планирования, но и от гибкости управленческих решений, способности оперативно расставлять приоритеты и обеспечивать устойчивую мотивацию команды.

Многозадачность в управлении проектами означает ситуацию, при которой один руководитель, одна команда или один ресурс задействованы в нескольких проектах одновременно. При этом каждый проект требует внимания, сроков, ответственности и, как правило, непредсказуемых усилий. В таких условиях традиционные методы — жёсткие планы, фиксированные бюджеты и строгие иерархии — нередко оказываются неэффективными. Организации нуждаются в адаптивных системах, способных учитывать изменчивость задач и ограниченность возможностей. Одной из главных проблем становится приоритезация. Проекты конкурируют между собой за одни и те же ресурсы, и задача менеджера — своевременно определять, какие из них требуют немедленного вмешательства, а какие могут быть отложены без ущерба для общего результата.

Нехватка ресурсов особенно остро проявляется в малых и средних организациях, где количество сотрудников и экспертов ограничено, а каждый член команды выполняет сразу несколько ролей. Подобная ситуация порождает риски выгорания персонала, падения качества, увеличения сроков выполнения задач. Чтобы справиться с этим, необходима культура прозрачной коммуникации и делегирования. Менеджеру проекта важно регулярно оценивать загрузку сотрудников, прогнозировать пиковые нагрузки и корректировать проектные графики, исходя из реальных возможностей команды.

Одним из действенных решений в условиях ограниченности ресурсов становится использование принципов гибкого управления (agile-методологии). Такие подходы, как Scrum и Kanban, позволяют разбивать большие проекты на короткие спринты, быстрее получать обратную связь, оперативно реагировать на изменения и экономить ресурсы за счёт отказа от

избыточного планирования. В условиях многозадачности именно гибкость и визуализация задач через доски, трекеры и статус-мониторинги становятся инструментами сохранения управляемости.

Кроме того, важно учитывать человеческий фактор. Сотрудники, находящиеся в постоянном режиме переключения между задачами, теряют концентрацию и эффективность. Исследования показывают, что многозадачность снижает продуктивность на 20–40%. В таких условиях важно не перегружать сотрудников параллельными задачами без чёткой системы контроля и поддержки. Разработка системы внутренних приоритетов, регулярные синхронизации внутри команды, ограничение количества активных задач на одного исполнителя — всё это способствует улучшению общего фокуса и результативности.

Организации также нуждаются в устойчивой системе оценки рисков. Многопроектная среда подразумевает рост вероятности отклонений по срокам и бюджету. Следовательно, управление рисками становится неотъемлемой частью проектного мышления. Регулярный анализ «узких мест», формирование сценариев на случай нехватки ресурсов, адаптация графиков и гибкое распределение резервов помогают минимизировать убытки и стабилизировать ход работ.

Таким образом, управление проектами в условиях многозадачности и ограниченных ресурсов требует не только технических знаний и владения современными инструментами, но и высокой степени эмоционального интеллекта, лидерства и способности управлять приоритетами. Успешный проектный менеджер в таких условиях — это человек, способный держать в фокусе общую стратегическую цель, вовлекать команду, а также сохранять равновесие между жёсткими ограничениями и стремлением к качественному результату. При правильной организации процессов даже в ситуации дефицита ресурсов можно добиться высокой эффективности, устойчивости и конкурентного преимущества.

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ЛЮПУСНЫЙ НЕФРИТ И ВЫДЕЛЕНИЕ ЛЕЙКОЦИТОВ ПОЧЕК

Аннотация: *Значительным последствием системной красной волчанки (СКВ) является повреждение почек, которое затрагивает не менее 20% лиц, подверженных риску развития терминальной стадии почечной недостаточности (ТПН). Предотвращение инфильтрации иммунных клеток в почки может замедлить развитие люпусного нефрита, поскольку эта инфильтрация тесно связана с заболеванием. Для изучения роли инфильтрирующих почки лейкоцитов требуются эффективные и воспроизводимые методы выделения.*
Ключевые слова*: суррогатные биомаркеры, люпусный нефрит, биопсия почек, стратификация, индивидуализированная медицина.*

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LUPUS NEPHRITIS AND THE ISOLATION OF KIDNEY LEUKOCYTE

Abstract: *A significant consequence of Systemic Lupus Erythematosus (SLE) is renal damage, which affects at least 20% of individuals who are at risk of developing end-stage renal disease (ESRD). Preventing immune cell infiltration into the kidneys may decrease the evolution of lupus nephritis because this infiltration is intimately associated with the disease.*

To examine the role of kidney-infiltrating leukocytes, efficient and reproducible isolation techniques are required.

Keywords: *surrogate biomarkers, lupus nephritis, renal biopsy, stratification, and individualized medication.*

Введение

Нефрит, распространённая и опасная особенность многих аутоиммунных заболеваний, приводит к серьёзной патологии и почечной недостаточности, что значительно увеличивает риск заболеваемости и смертности (Anders & Rovin, 2016; Davidson, 2016; McGaha & Madaio, 2014; Yu et al., 2017). Нефрит может иметь различные проявления и причины в зависимости от связанного с ним аутоиммунного заболевания. Повреждение почек часто вызвано

отложением иммунных комплексов в клубочках, что вызывает местное воспаление и привлечение провоспалительных иммунных клеток. Использование экспериментальных моделей СКВ помогло прояснить механизмы аутоиммунного нефрита. Индуцируемые модели используются для воспроизведения патофизиологии заболевания, например, путём введения аутореактивных антител, нацеленных на такие компоненты, как базальная мембрана клубочков (Reynolds, 2011) или мегалин (Spicer et al., 2007). Поскольку у этих животных отсутствует ингибирующий рецептор Fcγ для IgG, они демонстрируют гиперактивные ответы B-клеток и усиленный воспалительный ответ на иммунные комплексы, содержащие IgG. Как и в случае СКВ у людей, дефицит FcγRIIb вызывает спонтанную аутоиммунную патологию, включая спленомегалию, анемию, системную иммунную активацию, выработку антинуклеарных антител и смертельный нефрит (Bolland & Ravetch, 2000; Bolland et al., 2002; Tarasenko et al., 2007).

Оценка функции почек: анализ протеинурии

Для эффективного выделения инфильтрирующих почки лейкоцитов экспериментальных мышей обычно выбирают на поздних стадиях повреждения почек, когда инфильтрация иммунных клеток более выражена. У живых животных функцию почек можно оценивать по уровню креатинина в крови или азота мочевины крови (АМК). Однако частый забор крови в течение длительного времени может увеличить вариабельность, особенно в аутоиммунных моделях, как это требуется при исследовании прогрессирования заболевания. Регулярные заборы крови также могут повысить восприимчивость животного к инфекциям и изменить состав крови.

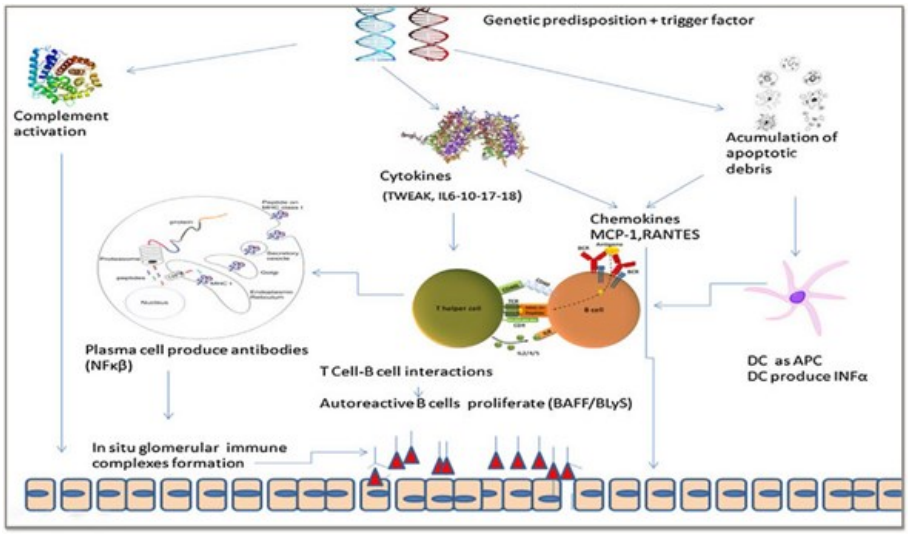
Материалы и методы

Сбор данных

Для подсчёта количества лейкоцитов, проникших в каждую почку: Для оценки образцов используется проточная цитометрия. Все образцы должны обрабатываться с одинаковыми параметрами, такими как одинаковое время сбора данных и объём образца, чтобы обеспечить точные сравнения.

Анализ проточной цитометрии

Для анализа результатов проточной цитометрии используется программное обеспечение FlowJo (Tree Star) или аналогичное. Циркулирующие лейкоциты идентифицируются с использованием антитела CD45.2, конъюгированного с BV421. Мыши без инъекций используются в качестве отрицательного контроля, а мыши, получившие инъекции, — в качестве положительного контроля. Образцы крови помогают определить правильные ворота. Эта техника помогает различать циркулирующие и инфильтрирующие лейкоциты и точно измерять присутствие иммунных клеток в ткани почек.



Патогенез люпусного нефрита

Хотя геномные исследования связали ряд генов с люпусным нефритом (ЛН), каждый ген лишь незначительно увеличивает риск системной красной волчанки (СКВ). Развитие заболевания дополнительно осложняется дисрегуляцией иммунной системы, на которую влияют экологические, гормональные и эпигенетические факторы. Наиболее вероятной причиной ЛН является образование иммунных комплексов в почках, в частности между внеклеточным хроматином в клубочках и циркулирующими антихроматиновыми антителами. Эти аутоантитела вызваны недостаточной очисткой нейтрофилами и макрофагами апоптотических клеток и повышенным оборотом воспалительных клеток.

Результаты и обсуждение

1. **Маркер протеинурии**

В модели FcγRIIb[KO] тяжесть протеинурии прямо коррелирует с уровнем инфильтрации лейкоцитов в почки. У самцов мышей признаки протеинурии обычно начинают проявляться примерно в возрасте 5 месяцев, тогда как у самок заболевание обычно развивается раньше.

2. **Управление реагентами: светочувствительность**

Флуорохром-конъюгированные антитела чувствительны к свету. Сократите воздействие света на животных сразу после введения инъекций, чтобы сохранить их целостность.

3. **Выбор флуорохромов и антител**

Антитела CD45.2 BV421 и CD45.2 PE-Cy7 обеспечили наиболее чёткие сигналы разделения среди протестированных вариантов при анализе на проточном цитометре LSR II (BD Biosciences).

Воспаление почек усугубляется локальной выработкой антител в почках, развитием лимфоидной ткани в тубулоинтерстициальной области и активацией системы комплемента. Активация дендритных клеток (DC) приводит к выработке большего количества интерферона (IFN) и усиливает презентацию антигенов за счёт повышения экспрессии MHC класса II. B-

клетки затем побуждаются к превращению в плазматические клетки, которые выделяют антитела, в то время как Т-клетки активируются. У пациентов с СКВ часто наблюдаются повышенные уровни интерферона и усиленная экспрессия мРНК лейкоцитов. Воспалительный цикл продолжается, и повторяющиеся эпизоды нефрита возникают из-за выработки провоспалительных цитокинов и хемокинов лейкоцитами и клетками почек в ответ на иммунные комплексы и компоненты комплемента.

Заключение

Оценка инфильтрации иммунных клеток в почки требует точных и эффективных методов из-за сложности и вариабельности аутоиммунных расстройств, особенно люпусного гломерулонефрита в мышиных моделях. Эта процедура использует мышиную модель с нокаутом FcγRIIb (FcγRIIb[KO]) для анализа инфильтрации лейкоцитов в почки контролируемым и надёжным образом. Эта модель демонстрирует высокую корреляцию между инфильтрацией иммунных клеток и повреждением почек, а степень протеинурии согласуется с этой связью. Мониторинг уровня протеинурии прост и может быть выполнен с помощью базовых анализов мочи.

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ИССЛЕДОВАНИЕ СОСТОЯНИЯ РАЗВИТИЯ ЦИФРОВОЙ ВАЛЮТЫ В КИТАЕ

Аннотация: *В последние годы, в связи со стремительным развитием технологии блокчейн и ростом цифровой экономики, цифровая валюта постепенно оказалась в центре внимания людей. Являясь одной из крупнейших цифровых экономик в мире, Китай также добился определенных успехов в области цифровой валюты. В этой статье мы обсудим историю развития, политическую среду, технологический прогресс и сценарии применения цифровой валюты Китая.*

Ключевые слова: *Цифровая экономика; цифровая валюта*

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A STUDY OF THE STATE OF DIGITAL CURRENCY DEVELOPMENT IN CHINA

Summary: *In recent years, with the rapid development of blockchain technology and the growth of the digital economy, digital currency has gradually become a topic of interest. As one of the largest digital economies in the world, China has also made significant progress in the field of digital currency. In this article, we will explore the history, political environment, technological advancements, and potential applications of China's digital currency.*

Keywords*:Digital economy; digital currency*

1. История развития цифровой валюты нашей страны

Развитие китайской цифровой валюты можно проследить с момента появления Биткоина в 2009 году. В то время концепция Биткоина только была предложена, а рынок цифровых валют Китая все еще находился в зачаточном состоянии. Со временем рынок цифровых валют Китая постепенно развивался, и появился ряд выдающихся проектов в области цифровых валют,

таких как NEO, ONT, VET и т.д. Среди них NEO, как одна из самых ранних цифровых валют в Китае, привлекла широкое внимание и обсуждение[135].

В 2017 году цена Биткоина взлетела до небес, привлекая внимание всего мира.Китайское правительство также начало уделять внимание развитию цифровых валют и включило их в список национальных стратегий развития. 24 октября 2019 года 18-е коллективное заседание Политбюро Коммунистической партии Китая провело специальное исследование, посвященное развитию технологии блокчейн, подчеркнув необходимость ускорения внедрения инноваций в технологии блокчейн и промышленного развития, а также активного содействия исследованиям и выпуску цифровых валют. В апреле 2020 года был создан исследовательский институт цифровых валют центрального банка, что ознаменовало новый этап в исследованиях цифровых валют Китая.

2. Политическая среда, связанная с цифровой валютой Китая

Развитие цифровой валюты Китая неотделимо от хорошей политической конъюнктуры. С 2017 года китайское правительство обнародовало ряд политических документов по цифровым валютам, которые оказали решительную поддержку развитию цифровых валют.

Прежде всего, китайское правительство активно поощряет исследования и применение цифровых валют. В августе 2017 года Народный банк Китая, Министерство промышленности и информационных технологий, Министерство общественной безопасности и другие семь ведомств совместно опубликовали "Объявление о предотвращении финансовых рисков, связанных с выпуском токенов", в котором разъяснили концепцию и риски цифровой валюты, а также сформулировали отношение к поощряйте исследования и применение технологий цифровой валюты.

Во-вторых, китайское правительство усилило надзор за цифровыми валютами. В сентябре 2017 года Центральный банк Китая опубликовал "Уведомление о предотвращении биткойн-рисков", в котором говорится, что цифровые валюты, такие как биткойн, не должны использоваться в качестве валюты и не должны вести бизнес в финансовых учреждениях. Кроме того, китайское правительство также регулировало платформы для торговли цифровыми валютами и усилило управление рынком цифровых валют[136].

Наконец, китайское правительство укрепило международное сотрудничество в области цифровых валют. В апреле 2018 года Научно-исследовательский институт цифровых валют Народного банка Китая и Научно-исследовательский институт цифровых валют Банка Японии подписали соглашение о сотрудничестве для совместного изучения разработки и применения цифровых валют. Кроме того, Китай активно

[135] China’s digital yuan extends usage into finance scenarios [Электронный ресурс] Reuters, june 17, 2022. – URL: https://www.reuters.com/article/china-currency-digital-idUSL4N2Y41IE.
[136] The challenges ahead for China’s digital yuan [Электронный ресурс] / The Straits Times, 15.08.2022. – URL: https://www.straitstimes.com/asia/east-asia/the-challenges-ahead-for-chinas-digital-yuan.

участвует в разработке международных стандартов цифровой валюты и создании международных институтов цифровой валюты для содействия интернационализации цифровых валют.

3. Технологический прогресс цифровой валюты Китая

Развитие цифровой валюты Китая пошло на пользу прогрессу технологии блокчейн.С непрерывным развитием технологии блокчейн технология цифровой валюты также постоянно внедряет инновации и совершенствуется.

Прежде всего, постепенно стала понятна техническая структура китайской цифровой валюты.Техническая архитектура цифровой валюты, предложенная исследовательским институтом цифровой валюты центрального банка, включает в себя базовые технологии, системы эмиссии и торговли, сценарии применения и т.д., которые обеспечивают техническую поддержку для разработки цифровых валют.

Во-вторых, повысилась безопасность китайской цифровой валюты.Институт цифровой валюты центрального банка предложил систему технологий безопасности для цифровых валют, включая криптографию, безопасную связь, безопасное хранение и безопасные вычисления, для обеспечения безопасности и надежности цифровых валют.

Наконец, была улучшена скорость транзакций и вычислительная мощность китайской цифровой валюты. Система торговли цифровыми валютами, предложенная исследовательским институтом цифровых валют Центрального банка, использует технологию распределенного реестра и технологию смарт-контрактов для обеспечения высокоскоростных транзакций и крупномасштабной параллельной обработки[137].

4. Сценарии применения цифровой валюты Китая

Сценарии применения китайской цифровой валюты также становятся все более и более обширными. В настоящее время цифровые валюты в основном используются в следующих областях：

Во-первых, для оплаты можно использовать цифровую валюту.С развитием цифровой экономики все больше и больше людей начинают использовать цифровые валюты для платежей.Способ оплаты цифровой валютой является более удобным и быстрым, что может значительно повысить эффективность платежей.

Во-вторых, цифровые валюты можно использовать для оказания финансовых услуг. Цифровая валюта может использоваться в качестве инвестиционного инструмента для привлечения большего числа инвесторов к участию в рынке цифровых валют, а также может предоставлять финансовые услуги предприятиям.

Наконец, цифровые валюты можно использовать для заключения смарт-контрактов. Технология смарт-контрактов в цифровой валюте позволяет

[137] The challenges ahead for China’s digital yuan [Электронный ресурс] / The Straits Times, 15.08.2022. – URL: https://www.straitstimes.com/asia/east-asia/the-challenges-ahead-for-chinas-digital-yuan.

автоматизировать исполнение контрактов и повысить эффективность и надежность исполнения контрактов.

В целом, в развитии китайской цифровой валюты были достигнуты определенные успехи, но она по-прежнему сталкивается с некоторыми вызовами и проблемами. В будущем развитие цифровой валюты Китая должно привести к усилению технологических инноваций, усилению надзора и управления, а также расширению сценариев применения для содействия здоровому, стабильному и устойчивому развитию цифровых валют.

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ОСТЕОАРТРИТ ГОЛЕНОСТОПНОГО СУСТАВА: К НОВОМУ ПОНИМАНИЮ И ВОЗМОЖНОСТЯМ ПРОФИЛАКТИКИ И ЛЕЧЕНИЯ

Резюме: *Остеоартрит голеностопного сустава (ОАГС) является одной из менее изученных форм дегенеративно-дистрофических поражений опорно-двигательной системы. Несмотря на относительную редкость, данная патология отличается высокой клинической значимостью ввиду стойкого болевого синдрома, нарастающих функциональных ограничений и значительного влияния на качество жизни пациентов, особенно в трудоспособном возрасте. В отличие от более широко распространённых форм — коленного и тазобедренного остеоартрита — ОАГС в подавляющем большинстве случаев развивается на фоне ранее перенесённых травм: внутрисуставных переломов, вывихов, хронической нестабильности. Это определяет особую стратегию подходов к его диагностике, профилактике и лечению.*

Ключевые слова: *остеоартрит, голеностопный сустав, диагностика, посттравматический остеоартрит, профилактика, биомеханика, регенеративная медицина, ортопедия.*

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KIDNEY ARTHRITIS: A NEW UNDERSTANDING AND OPPORTUNITIES FOR PREVENTION AND TREATMENT

Abstract: *Osteoarthritis of the ankle joint (OAGJ) is one of the least studied forms of degenerative-dystrophic lesions of the musculoskeletal system. Despite its relative rarity, this pathology is distinguished by its high clinical significance due to persistent pain syndrome, increasing functional limitations, and significant impact on the quality of life of patients, especially in working age. Unlike the more common forms - knee and hip osteoarthritis - OAGS in the vast majority of cases develops against the background of previously suffered injuries: intra-articular fractures, dislocations, and chronic instability. This determines the specific strategy of approaches to its diagnosis, prevention, and treatment.*

Keywords: *osteoarthritis, ankle joint, diagnosis, post-traumatic osteoarthritis, prevention, biomechanics, regenerative medicine, orthopedics.*

Введение. На основании анализа литературных данных установлено, что наиболее высокую чувствительность на ранних стадиях ОАГС демонстрируют методы магнитно-резонансной томографии, определение биомаркеров, например, COMP [1] и CTX-II [2]), трёхмерной визуализации и компьютеризированной биомеханики. На сегодняшний день клинически оправданной считается поэтапная лечебная стратегия: от комплексной физической реабилитации и индивидуального ортезирования до применения PRP-инъекций, гиалуроновой кислоты и клеточных технологий. В более тяжёлых случаях показаны органосохраняющие вмешательства и, при выраженной деструкции сустава, — артродез либо эндопротезирование [3–5]. Выявлены тенденции к снижению инвазивности хирургических методов и расширению показаний к применению регенеративной терапии.

Остеоартрит голеностопного сустава (ОАГС) представляет собой одну из клинических форм хронических дегенеративно-дистрофических поражений суставного хряща, при которой патологический процесс затрагивает не только гиалиновый хрящ, но и синовиальную оболочку, субхондральную кость, связочно-сухожильный аппарат и окружающие мягкие ткани. Заболевание характеризуется медленно прогрессирующим течением, нарастающей болью, ограничением подвижности и выраженными функциональными нарушениями, приводящими к снижению физической активности и качества жизни пациентов. Наиболее типичными клиническими проявлениями являются боль при нагрузке, ощущение скованности, нестабильность и локализованная отёчность. В запущенных случаях наблюдается деформация сустава и стойкое ограничение движений вплоть до формирования анкилоза.

Цель исследования — провести всесторонний анализ современных научных данных по вопросам патогенеза, клинических проявлений, диагностики, профилактических стратегий и лечебной тактики при остеоартрите голеностопного сустава.

Материалы исследования. Проведён систематический обзор актуальной научной литературы за последние 15 лет (2009–2024 гг.) с использованием международных баз данных PubMed, Scopus и Google Scholar. В отбор включались рандомизированные контролируемые исследования, систематические обзоры, метаанализы и национальные клинические рекомендации. Анализу подвергались источники, содержащие сведения о диагностических критериях, сравнении эффективности различных лечебных подходов (консервативных и хирургических), а также публикации, посвящённые новым технологиям визуализации, ортезирования и клеточной терапии.

Результаты и обсуждение.

Современные достижения в области молекулярной диагностики (определение биомаркеров, высокоточной визуализации и регенеративной ортопедии позволяют по-новому взглянуть на тактику ведения пациентов с ОАГС. Актуальными становятся принципы персонифицированного подхода, раннего вмешательства и мультидисциплинарного сопровождения. Учитывая молодую возрастную группу большинства пациентов, особое значение приобретает вопрос сохранения функции сустава и профилактики инвалидизации.

Особенностью остеоартрита голеностопного сустава является преобладание посттравматического генеза. В отличие от коленного и тазобедренного остеоартрита, в основе ОАГС, как правило, лежит механическое повреждение суставных поверхностей вследствие переломов, вывихов, хронической нестабильности или повторяющихся микротравм. Это объясняет, почему ОАГС чаще диагностируется у лиц молодого и среднего возраста, ведущих активный образ жизни или имеющих профессиональные нагрузки, связанные с физическим трудом или спортом [3, 6, 7]. При этом хрящевая ткань в области голеностопного сустава изначально имеет меньшую толщину по сравнению с другими суставами, что повышает уязвимость к травматическому и воспалительному воздействию [8].

Распространённость остеоартрита голеностопного сустава существенно ниже по сравнению с другими локализациями остеоартрита, однако его клиническая значимость и социально-экономические последствия не уступают другим формам заболевания. У пациентов с ОАГС наблюдаются трудности при ходьбе, ограничение физической активности, частые периоды временной нетрудоспособности, а в тяжёлых случаях – формирование стойкой инвалидности. Отсутствие стандартизированных протоколов диагностики, недостаточная осведомлённость врачей первичного звена и недостаточное внимание к травматическому анамнезу приводят к тому, что заболевание нередко диагностируется на поздних стадиях, когда возможности консервативного лечения уже ограничены.

В последние годы наблюдается рост интереса к проблеме остеоартрита голеностопного сустава со стороны клиницистов, ортопедов, травматологов и специалистов в области медицинской реабилитации. Это связано не только с возрастающим числом посттравматических осложнений, но и с развитием технологий визуализации, молекулярной диагностики и регенеративной медицины. Появление новых методов оценки биомеханики стопы, трёхмерной визуализации суставных поверхностей и персонализированных ортопедических решений открывает новые перспективы для раннего выявления и патогенетически обоснованного лечения ОАГС [9, 10].

Несмотря на то что остеоартрит голеностопного сустава (ОАГС) встречается значительно реже, чем поражения коленного или тазобедренного суставов, его значимость в клинической практике нельзя недооценивать. Особенно тревожным является тот факт, что заболевание нередко поражает

лиц в возрасте от 30 до 55 лет — социально активную и трудоспособную часть населения. Это приводит к стойкому снижению физической активности, ограничению профессиональной реализации и, в ряде случаев, к ранней инвалидизации, что обуславливает не только медицинскую, но и серьёзную социально-экономическую нагрузку.

Выводы. Комплексный подход к диагностике и лечению остеоартрита голеностопного сустава, основанный на современных технологиях и доказательной базе, способен значительно улучшить клинические исходы, повысить уровень физической активности и социальную адаптацию пациентов. Разработка алгоритмов раннего выявления, комбинированной терапии и инновационных хирургических вмешательств позволит минимизировать потребность в радикальных операциях и улучшить качество медицинской помощи данной группе пациентов.

Остеоартрит голеностопного сустава представляет собой сложное, мультифакторное заболевание, развивающееся преимущественно у пациентов с травматическим анамнезом. Относительно низкая встречаемость не должна снижать клиническую настороженность, поскольку последствия заболевания — боль, нарушение опоры и движений, потеря трудоспособности — могут быть крайне выраженными и устойчивыми.

Комплексный и этапный подход, интеграция современных технологий, а также мультидисциплинарное взаимодействие специалистов являются залогом успешного ведения пациентов с ОАГС. Перспективы дальнейших исследований — в создании национальных регистров, клинических алгоритмов и реабилитационных дорожных карт, обеспечивающих не только сохранение функции, но и достойное качество жизни.

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НЕСТАБИЛЬНОСТЬ ГОЛЕНОСТОПА ПРИ ВРАЩАТЕЛЬНЫХ НАГРУЗКАХ: ОБЗОР СОВРЕМЕННЫХ КОНЦЕПЦИЙ

Резюме: *Растяжения связок голеностопного сустава встречаются очень часто. Для выбора оптимальной тактики лечения и предотвращения развития хронической нестабильности или повторных травм необходимо чётко представлять себе характер восстановления после таких повреждений и факторы риска, способствующие затяжному течению или рецидивам. При недостаточно быстром и точном диагнозе разрывы связок могут оставаться без лечения, что ведёт к хронической нестабильности после острых латеральных или медиальных растяжений. Особенно опасны повреждения медиального связочного комплекса (МСК), прежде всего передней пучковой части дельтовидной связки: они могут вызвать ротационную нестабильность голеностопного сустава (РНГС). Чаще всего РНГС развивается при сочетании разрыва передних волокон МСК и ослабления передней талофибулярной связки (ПТФС), тогда как травмы промежуточных волокон МСК приводят к изолированной медиальной нестабильности (МНГС). Первоначально предпочтительно консервативное лечение; хирургическое вмешательство рассматривается при неэффективности реабилитации или в особых клинических ситуациях. Среди оперативных методик применяют анатомическую пластику и реконструкцию связок, а также тенодезы. Артроскопия голеностопного сустава всё чаще используется не только для восстановления связочного аппарата, но и для выявления и лечения сопутствующих внутрисуставных изменений. Артроскопическая резекция и ушивание повреждённых пучков МСК по методике «all-inside» демонстрирует хорошие результаты как при медиальной, так и при ротационной нестабильности.*

Ключевые слова: *голеностопный сустав, артроскопия, ХНИГС, хроническая нестабильность, медиальная нестабильность, ротационная нестабильность, восстановление связок*

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ANKLE INSTABILITY UNDER ROTATIONAL LOADS: A REVIEW OF CONTEMPORARY CONCEPTS

Abstract. *Ankle ligament sprains are very common. To select the optimal treatment strategy and prevent the development of chronic instability or recurrent injuries, it is essential to clearly understand the recovery process following these injuries and the risk factors contributing to prolonged courses or relapses. Without sufficiently rapid and accurate diagnosis, ligament tears may remain untreated, leading to chronic instability after acute lateral or medial sprains. Injuries to the medial ligament complex (MLC), particularly the anterior bundle of the deltoid ligament, are especially dangerous, as they can cause rotational instability of the ankle joint (RIAJ). Rotational instability most often develops when tears of the anterior fibers of the MLC coincide with attenuation of the anterior talofibular ligament (ATFL), whereas injuries to the intermediate fibers of the MLC result in isolated medial instability (IMI). Initially, conservative treatment is preferred; surgical intervention is considered when rehabilitation is ineffective or in specific clinical scenarios. Operative techniques include anatomic ligamentoplasty and reconstruction, as well as tenodesis procedures. Ankle arthroscopy is increasingly used not only for restoration of the ligamentous apparatus but also for identification and treatment of concomitant intra-articular changes. Arthroscopic resection and repair of damaged MLC bundles using an "all-inside" technique demonstrate favorable outcomes in both medial and rotational instability.*

Keywords: *ankle joint, arthroscopy, RIAJ, chronic instability, medial instability, rotational instability, ligament repair*

Введение. Растяжения голеностопного сустава входят в число наиболее частых травм опорно-двигательного аппарата и спортивных повреждений. Клиническая картина бывает неоднозначной, и зачастую такие растяжения остаются без адекватного лечения, что приводит к развитию хронической нестабильности голеностопа (ХНГС) как по медиальному, так и по латеральному типу. При сочетанных повреждениях медиального и латерального связочных аппаратов может формироваться ротационная нестабильность сустава. Хроническая перегрузка, например при длительной дисфункции задней большеберцовой сухожильной группы, способна привести к повреждению медиального связочного комплекса (МСК) [1,2].

Нестабильность медиального и латерального отделов возникает вследствие травм отдельных звеньев связочного аппарата голеностопа: передней и задней талофибулярных связок (ПТФС и ЗТФС), пяточно-берцовой связки (ПБС), передней большеберцово-таранной связки (ПБТС); а также поверхностного и глубокого пучков дельтовидной связки (ДСК) — тибиокальканеального (ТКС) и задней большеберцово-таранной связки (ЗБТС) [3].

Острые повреждения МСК обычно происходят при пронации с наружной ротацией стопы или реже — при супинации с внешней ротацией,

что может сопровождаться переломами малоберцовой, большеберцовой лодыжек или обеих сразу, а также повреждением синдесмоза. Изолированные разрывы МСК встречаются редко. Оценка показаний к немедленному хирургическому восстановлению остаётся спорной, и чаще всего применяется консервативная тактика лечения.

В современной литературе отсутствует единство мнений относительно течения острых латеральных растяжений голеностопа и прогностических факторов, определяющих неполное восстановление или рецидивы. При нагрузке дефицит передней талофибулярной связки ведёт к смещению таранной кости кпереди и кнутри, а также к её проксимальному смещению из лодыжечной щели. Эти изменения нарушают биомеханику сустава и могут со временем вызвать вторичный остеоартроз [4].

Цель исследования — изучить нестабильность голеностопа при вращательных нагрузках: обзор современных концепций.

Материалы исследования. Передняя талофибулярная связка повреждается чаще всего, затем — пяточно-берцовая. Несмотря на адекватное консервативное лечение, у 15–20% пациентов сохраняются симптомы нестабильности и возникают повторные растяжения. Хроническая нестабильность может иметь медиальную и латеральную форму, при этом у 40% пациентов с ХНГС отмечаются частичные разрывы дельтовидной связки.

При повреждениях МСК консервативная терапия остаётся первой линией лечения. Если она оказывается неэффективной, развивается медиальная нестабильность голеностопа (МНГС), проявляющаяся ощущением «подвывиха» медиального края сустава при ходьбе или в покое, часто на фоне асимметричного вальгус-отклонения заднего отдела стопы.

Результаты и обсуждение. Анатомия и биомеханика голеностопного сустава в нормальном положении большеберцовая и малоберцовая кости надёжно фиксируют таранную кость в суставной щели. При подошвенном сгибании мягкие ткани оказываются более уязвимы к растяжению и повреждению [5].

Латеральный связочный комплекс (ЛСК) включает три основные связки: пяточно-берцовую (ПБС), переднюю тало-берцовую (ПТБС) и заднюю тало-берцовую (ЗТБС). Пяточно-берцовая связка представляет собой широкую капсулу внеполосную тяжевидную структуру, идущую от дистального конца малоберцовой кости книзу и кзади, проходит глубоко под сухожилиями малоберцовых мышц и прикрепляется к задней поверхности пяточной кости. Во время тыльного сгибания стопы она располагается вертикально и главным образом стабилизирует голеностопный, а вторично — подтаранный сустав. Изолированные повреждения ПБС встречаются редко [6].

Передняя тало-берцовая связка представляет собой утолщение капсулы сустава,19 является самой слабой и наиболее передней в составе ЛСК, поэтому травмируется чаще всего. В положении подошвенного сгибания ПТБС принимает вертикальное направление и главным образом препятствует

инверсии стопы. Между этой связкой и ПБС существуют дугообразные соединительные волокна, которые дополняют укрепление капсулы подтаранного сустава [7].

Задняя тало-берцовая связка — наиболее прочная и устойчивая часть ЛСК. Ее разрывы почти всегда сочетаются с травмами ПТБС и ПБС и крайне редко встречаются изолированно. Эта трапециевидная связка берёт начало на заднем конце латеральной лодыжки и прикрепляется к задненаружному бугру таранной кости или к ос триргонум, если он присутствует [8].

Наиболее распространённым механизмом латерального растяжения голеностопа является чрезмерная внутренняя ротация стопы в сочетании с инверсией заднего отдела голеностопа и наружной ротацией голени. При этом в 100% случаев повреждается ПТБС, в 50–75% — ПБС и менее чем в 10% — ЗТБС [9].

Незадолго после травмы из-за боли и отёка сложно объективно оценить степень нестабильности; поэтому клиническую проверку целесообразно проводить спустя 48 часов, когда острые симптомы начинают стихать.

В последнее время описано понятие «микрониестабильности» голеностопа, возникающей при изолированном разрыве верхней части ПТБС. Пациенты с микронестабильностью жалуются на рецидивирующие растяжения и хронические боли в переднелатеральном отделе сустава. При дальнейшем воздействии инверсионных сил нижняя часть ПТБС и ПБС также могут повреждаться, что уже проявляется явной нестабильностью голеностопа.

Латеральные растяжения составляют около 85% всех повреждений голеностопа. Изолированные травмы медиального связочного комплекса (МСК) случаются реже, обычно при вынужденной наружной ротации стопы, и порой сопровождаются переломами или вывихами. Роль МСК в общей нестабильности сустава до конца не исследована, однако её разрывы проявляются чувством «подвывиха» по медиальному краю, болями в этой области, а также коррегируемым вальгусным и пронационным отклонением заднего отдела стопы. У большинства пациентов (77%) повреждения МСК сочетаются с травмами ЛСК, и в 69% случаев оба комплекса требуют хирургической реконструкции. В то же время при разрывах дельтовидной связки в сочетании со вставновочными переломами лодыжек чаще используют консервативное лечение.

При одновременном повреждении медиального и латерального связочных комплексов после растяжения голеностопа может развиться ротационная нестабильность сустава (RNI). Под этим термином понимают повышенную внутреннюю ротацию таранной кости в голеностопном канале, что перегружает поверхностный слой дельтовидной связки и может приводить к её разрыву, особенно передней части комплекса [10].

Клиническая диагностика RNI затруднена, поскольку пациенты часто не отмечают симптомов с медиальной стороны сустава. Если таким пациентам выполнить лишь реконструкцию латерального комплекса, через несколько

месяцев появятся боли и нестабильность медиальной зоны. Поэтому при любом подозрении на комбинированное повреждение следует одновременно оценить и при необходимости восстановить дельтовидную связку [11].

Изолированная медиальная нестабильность встречается редко, но при плоскостопии, гиперпронации или общей связочной гипермобильности может развиться хроническая нестабильность с риском травм МСК. При медиальной нестабильности пациенты жалуются на боль, отек и болезненность по обоим краям лодыжки, однако большинство функциональных проб (тесты на валгусную нестабильность, на внешнюю ротацию, тести «талорельс» и др.) часто дают ложноотрицательные результаты и не позволяют достоверно оценить состояние МСК [12].

По данным литературы, у 10–15% пациентов с хронической нестабильностью голеностопа развивается ротационная форма, которую вдвойне сложно выявить при стандартном осмотре и которая зачастую остается незамеченной. При RNI пациенты на более поздних этапах отмечают усиление латеральной нестабильности и возникающую при этом боль по медиальному краю сустава, а у 23% вовсе отсутствуют специфические медиальные симптомы. Поэтому при каждом обследовании важно тщательно пальпировать медиальный отдел, проверять целостность связок и оценивать появление вальгусной и пронационной девиации стопы. При ослаблении передней части дельтовидной связки таранная кость может смещаться вперёд и выполнять наружную ротацию в голеностопном канале, что и приводит к ротационной нестабильности.

Выводы. Артроскопия голеностопного сустава в последние годы позволила глубже понять механизмы развития и выработать классификацию нестабильности. После повреждений медиального связочного комплекса могут проявляться два основных синдрома: медиальная нестабильность (MAI) и ротационная нестабильность (RAI). Часто сопровождающие нестабильность внутрисуставные поражения эффективно устраняются именно при артроскопии, которая даёт возможность одновременно и реконструировать связки, и лечить сопутствующие внутрисуставные патологии. Несмотря на ограниченные данные, существующие исследования показывают, что артроскопическая «all-inside» репарация как латерального, так и дельтовидного комплекса обеспечивает хорошие клинические результаты и выглядит многообещающе для лечения MAI и RAI.

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СИНТЕЗ И СОСТАВ КООРДИНАЦИОННЫХ СОЕДИНЕНИЙ ТИОСЕМИКАРБАЗОНА ПАРАОКСИБЕНЗОАЛЬДЕГИДА С МОЛИБДЕНОМ

Аннотация. *Синтезированы координационные соединения тиосемикарбазон параоксибензоальдегид с молибденом. Установлены состав, индивидуальность, способы координации молекул тиосемикарбазона, параоксибензоалдегидного фрагмента. Методами колебательной спектроскопии и термического анализа доказаны способы координации органических лигандов, окружение центрального иона и термическое поведение синтезированных соединений. Сравнением межплоскостных расстояний и относительных интенсивностей тиосемикарбазона, параоксибензоальдегид и их комплексных соединений состава $[MoO_2(ТСКпОБА)_2]\cdot 2H_2O$ показано, что новые координационные соединения отличаются между собой, а также от исходных компонентов, следовательно, соединения имеют индивидуальную кристаллическую решетку.*

Ключевые слова: *Синтез, состав, индивидуальность, физико-химические методы анализа, термическая устойчивость, координационные соединения, тиосемикарбазон парабензоальдегид.*

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SYNTHESIS AND COMPOSITION OF COORDINATION COMPOUNDS OF THIOSEMICARBAZONE PARAOXYBENZOALDEHYDE WITH MOLYBDENUM

Abstract: *Coordination compounds of thiosemicarbazone paraoxybenzaldehyde with molybdenum were synthesized. The composition, individuality, and coordination modes of thiosemicarbazone and paraoxybenzaldehyde fragment molecules were established. The coordination modes of organic ligands, the environment of the central ion, and the thermal behavior of the synthesized compounds were demonstrated using vibrational spectroscopy and thermal analysis methods. By comparing the interplanar distances and relative intensities of thiosemicarbazone, paraoxybenzaldehyde, and their complex compounds of the composition $[MoO_2(TSKpOBA)_2]\cdot 2H_2O$, it was shown that the new coordination compounds differ from each other as well as from*

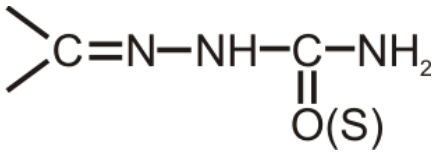
the starting components, indicating that the compounds possess an individual crystal lattice.

Keywords: *Synthesis, composition, individuality, physicochemical methods of analysis, thermal stability, coordination compounds, thiosemicarbazone paraoxybenzaldehyde.*

Введение. В современной координационной химии в разделе химии твердого тела металлокомплексы, содержащие в лигандном окружении разные N,O-донорные центры, занимают особое место. Интерес к ним обусловлен тем, что исследование таких металлокомплексов развивается в связи с их использованием в качестве молекулярных магнетиков, каталитических систем, компонентов оптических регистрирующих сред и др. Они являются хорошими моделями для изучения проблемы конкурентной координации в химии комплексных соединений благодаря специфическому действию их окружения на стереохимию полиэдров. Комплексные соединения металлов обладая рядом специфических свойств, нашли широкое практическое использование во многих отраслях народного хозяйства.

Бурное развитие химии координационных соединений переходных металлов с N, O, S- содержащими органическими лигандами обусловлено весьма широким спектром их действия в качестве биологически активных соединений, аналитических реагентов и катализаторов, используемых в химической промышленности.

Среди вышеупомянутых органических соединений особое место занимают производные тиосемикарбозонов, который содержит фрагменты



Интерес к строению этого лиганда связан с тем, что он способен находиться в различных туатомерных формах. Наличие же во фрагменте разнообразных донорных атомов азота, кислорода, серы и радикалов существенно влияет на процесс комплексообразования и в зависимости от электронной структуры металла происходит стабилизация лигандов той или иной таутомерной формы.

Известно, что производные семикарбазонов участвуют во многих биологических процессах и в зависимости от количества применяемой дозы проявляют стимулирующую и гербицидную активность в семенах низких растений и зерновых культур. С другой стороны, в жизни растений большое значение имеет молибден. Этот элемент играет важную роль при синтезе белка и в обменных процессах соединений азота у растений. Кроме этого, молибден необходим для нормального усвоения атмосферного азота бобвыми культурами. Использование молибдена в сельском хозяйстве вместе с

органическими веществами обеспечивает сохранность фосфора в почве на весь период роста растений. В литературе описано что за счет синергетического эффекта, биологическая активность комплексов повышается по сравнению с суммарным биологическим эффектом составляющих исходных компонентов.

Объекты и методы исследования. Для осуществления синтеза тиосемикарбазона параоксибензальдегида взяли 9,1 г (0,1 моль) тиосеикарбазона и растворили в 50 мл дистиллированной воды и добавили параоксибензальдегида (12,2 г (0,1 моль) в 50 мл этаноле). Температуру реакционной смеси добавили до 85°С при интенсивном перемешивании. Через 3 часа выпал осадок белого цвета, который промыли горячей водой и сушили при комнатной температуре. Выход продукта 86%.

Для синтеза новых координационных соединений состава $[MoO_2(TCKnOБA)_2]2H_2O$ нами выбрано 2,41 г (0,01 моль) натрия молибдата, который растворили в 50 мл дистиллированной воды. Затем к 50 мл дистиллированной воды добавили 2.90 г (0,01 моль) тиосемикарбазона n-оксибензальдегида. Смешали оба раствора, нагрели до 80-85°С. При интенсивном перемешивании. Через 20 мин раствор стал мутным, зелено-голубого цвета с pH=8. Добавляя по капля концентрированную HCl, pH раствора довели до нейтральной, после чего цвет раствора стал коричневым. Осадок промыли и сушили при комнатной температуре. Выход продукта составил 89% от ожидаемого.

Анализ синтезированных соединений на содержания молибдена проводили согласно. Азот определяли по методу Дюма , углерод и водород-сжиганием в токе кислорода. Результаты элементного анализа координационных соединений диоксокомплекса молибдена (VI) с тиосемикарбазонам приведены в *таблице 1*. Для установления индивидуальности синтезированных соединений снимали рентгенограммы на установке ДРОН-2,0 с Cu-антикатодом. ИК-спектры поглощения записывали в области 400-4000 $см^{-1}$ на спектрометре AVATAP-360 фирмы “Nicolet”. Термический анализ проводили на дериватографе системы F.Paulik- J.Paulik-L.Erdey со скоростью 9 град.мин, и навеской 0,1 гр. при чувствительности гальванометров Т-900, ТГ-200, ДТА , ДТГ-1/10. Запись осуществляли в атмосферных условиях. Держателем служил платиновый тигель диаметром 10 мм без крышки. В качестве эталона использовали Al_2O_3.

Таблица 1.

Результаты элементного анализа комплексных соединений диоксокомплекса молибдена (VI) с тиосемикарбазоном

Соединения	*Элементы в процентах*									
	Me, %		C, %		H, %		N, %		S, %	
	Найдено	Вычислено	Найдено	Вычислено	Найдено	Вычислено	Найдено	Вычислено	Найдено	Вычислено
$[MoO_2(ТСКБА)\cdot H_2O]\cdot H_2O$	26.44	25.13	32.68	34.85	2.98	3.69	12.42	11.08	9.11	8.44
$[MoO_2(ТСКпОБА)_2]2H_2O$	19.17	19.43	39.06	39.41	4.81	3.50	17.51	17.91	5.45	6.54

Результаты и их обсуждение. Сравнение межплоскостных расстояний и относительных интенсивностей, диоксокомплекса Mo(VI), тиосемикарбазона, n-оксибензальдегида и их координационные соединения показало, что новый комплексный соединений отличаются между собой, а также от исходных компонентов, следовательно, соединения имеют индивидуальную кристаллическую решетку (*рисунок 1, 2*).

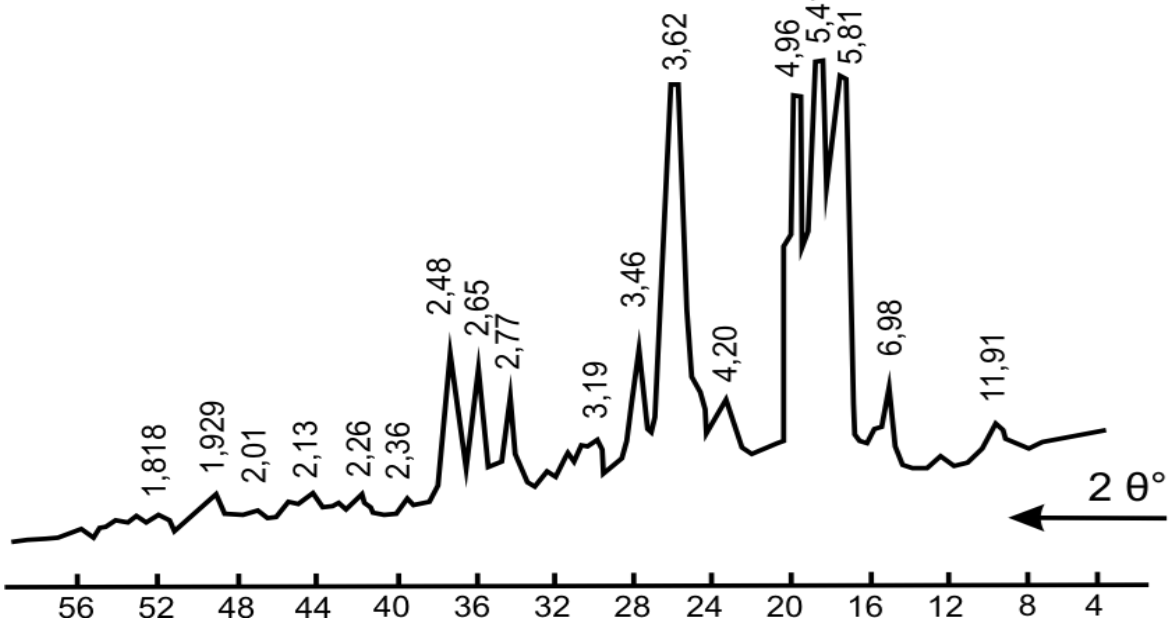


Рисунок 1. Рентгенограмма молекулы тиосемикарбазона параоксибензальдегид.

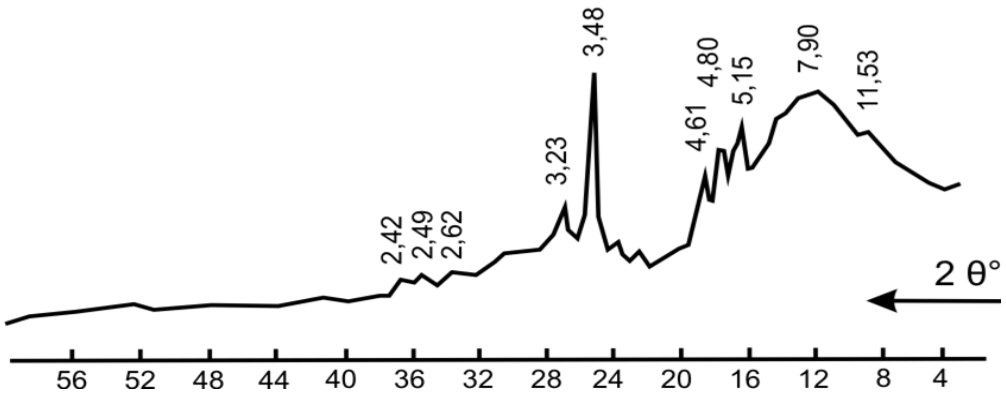


Рисунок 2. Рентгенограмма молекулы тиосемикарбазона параоксибензальдегид с молибденом.

Анализ ИК спектров поглощения полученных производных тиосемикарбозонов показал, что в высокочастотной области спектра проявляются частоты, характерные для валентных колебаний связей OH, NH, $N^{+}H_2$, молекул воды, первичных и вторичных аминных групп. Частоты связей C=N и C=O проявляются в области 1640-1670 $см^{-1}$. Полосы, характерные для сульфатного дианиона обнаружены при 1150, 970 и 620-630 $см^{-1}$. Частоты в области, 1440-1465 $см^{-1}$ обусловлены колебаниями ароматического кольца. Полосы валентных колебаний связей C-H замещенного бензольного кольца, плоских и неплоских деформационных колебаний связей C-H ароматического кольца наблюдаются соответственно при 710-800 $см^{-1}$.

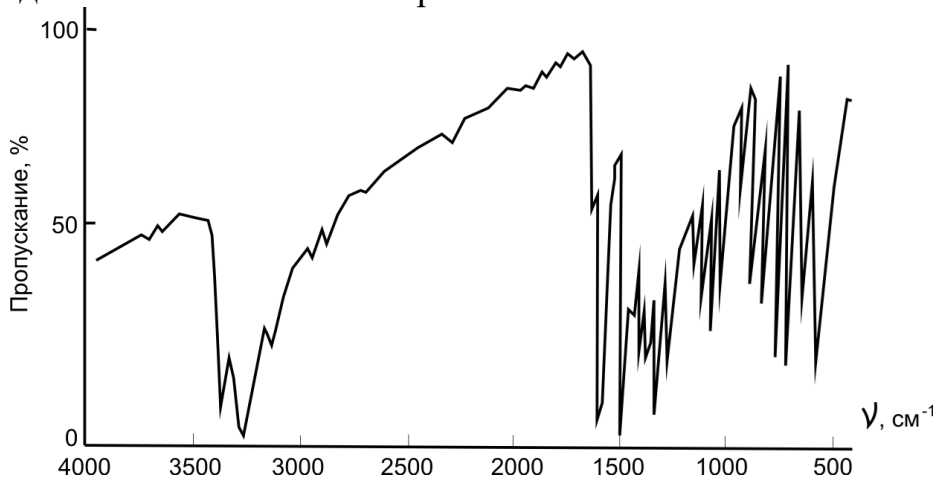


Рисунок 3. ИК-спектры поглощения молекулы тиосемикарбазона бензальдегида.

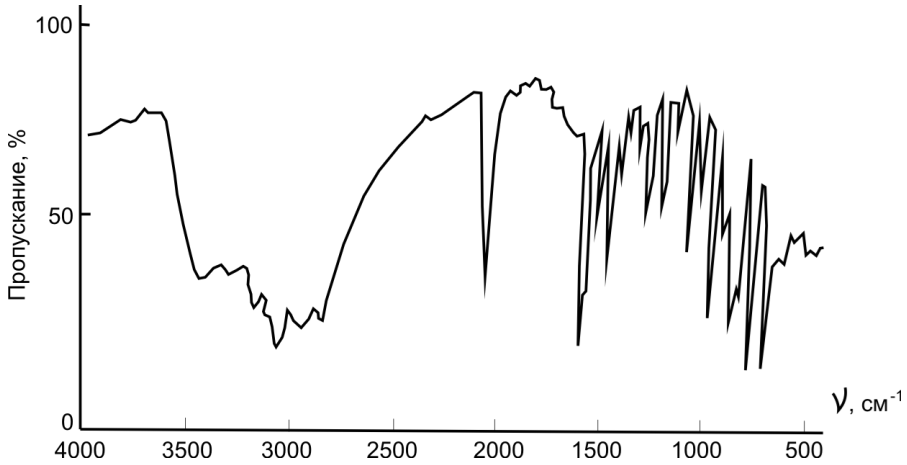


Рисунок 4. ИК-спектры поглощения молекулы $[MoO_2(ТСКБА)\cdot H_2O]\cdot H_2O$.

В процессе комплексообразования в молекулах семикарбазонов происходят перегруппировки тигидразидной части лигандов, т.е. с приближением катиона комплексообразователя разрываются π-связи группы C=S и одновременного протон вторичной аминной группы мигрирует к атому серы и замещается ионом молибдена. В ИК-спектрах диоксокомплексов из-за сложения спектров весьма трудно точно определить изменения характеристических частот координированных лигандов. Однако, имеются определенные отличия и изменения положение частот, по которым следует предложить образование пятичленного хелатного цикла с участием азометинового атома азота и атома серы. Так, в спектрах большинства комплексов в области 600-700 $см^{-1}$ проявляются новые полосы, отнесенные к валентным колебаниям связи C-S-.

Кривая нагревания ДТА соединения ТСКп-ОБА обусловливается эндоэффектами при 110; 190; 230; 360 и экзоэффектами при 390 и 420°С. Первый эндоэффект следует отнести к плавлению. Последующие эндоэффекты характеризуется интенсивным разложением органического лиганда. Последние два экзоэффекты соответствует окончательному выгоранию продуктов.

Термолиза $Mo(ТСКп\text{-}ОБА)_2\cdot 2H_2O$ отмечены эндоэффект при 90; 832 и экзотермические эффекты при 210; 390; 500; 545°С. Первый эффект следует отнести к отщеплению двух молекул воды. Убыль массы по кривой ТГ составляет 6.85% (вычислено 6.95%). Природы других экзотермических эффектов обусловлены интенсивным стадийным разложением комплекса. Общая убыль массы при 600°С составляет 76.0%.

На кривой ДТА комплекса $MoO_2(ТСКБА)\cdot 2H_2O$ отмечены эндоэффекты при 87; 130; 280; 305; 615 и экзоэффекты при 350, 450 и 535°С. Первый эндоэффект соответствует удалению 1.5 молекулы воды. При этом убыль массы по кривой ТГ составляет 6.55% (вычислено 6.49%). Второй эндоэффект характеризуется обезвоживанием комплекса, убыль массы в интервале температур 120-140°С составляет 2.16%. Природа последующих

термоэффектов связано интенсивным разложением безводного комплекса диоксомолибдена (VI). Характер двух последних экзотермических эффектов обусловлен окислением продуктов термолиза молибденового комплекса. Убыль массы в диапазоне температур 450-520°С составляет около 2%. Общая убыль массы при 600°С составляет 73%.

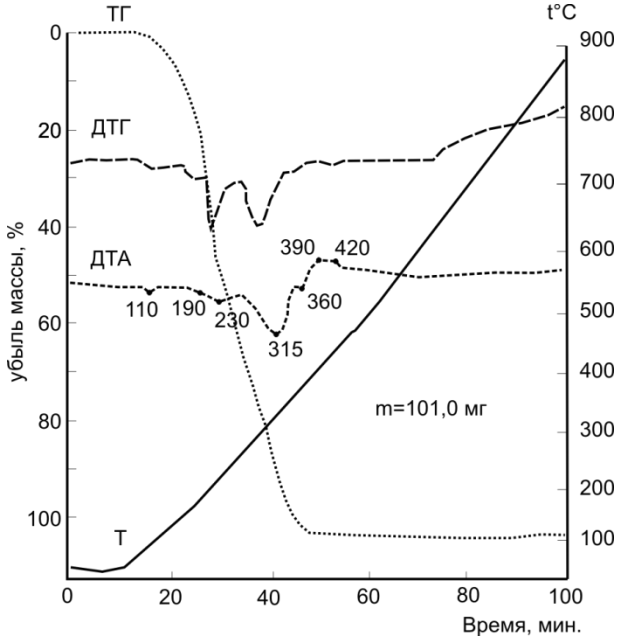


Рисунок 5. Дериватограмма свободного молекулы ТСКпОБА.

ВЫВОДЫ

Впервые разработаны условия синтеза тиосемикарбазона n-бензальдегида с молибденом (VI). С помощью рентгенофазового, колебательной спектроскопии, дериватографического анализов доказаны индивидуальность, способы координации молекул тиосемикарбазида и n-оксибензальдегида с молибденом (VI) и термическое поведение синтезированных соединений.

В результате исследования термического поведения соединений установлено, что термические характеристики синтезированных комплексов зависят от природы лигандов, состава соединений, дентатности ацидолигандов и характера внешнесферных анионов. Кристаллизационные молекулы воды удаляются при низких температурах. Показано что конечными продуктами термолиза являются MoO_2S.

Полученные результаты могут быть использованы для синтеза других органических лигандов и координационных соединений d-металлов, а также могут служить в качестве справочных данных для научных соотрудников и работающих в области координационной химии.

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СИНТЕЗ СЕМИКОРБАЗОНА ПАРАОКСИБЕНЗОАЛЬДЕГИДА С МОЛИБДЕНОМ

Аннотация. *Синтезированы семикорбазона параоксибензоальдегид с молибденом. Установлены состав, индивидуальность, способы синтез молекул, семикорбазона параоксибензоалдегидного фрагмента. Методами колебательной спектроскопии и термического анализа доказаны способы координации органических лигандов, окружение центрального иона и термическое поведение синтезированных соединений.*

Ключевые слова: *Синтез, состав,индивидуальность, физико-химические методы анализа, термическая устойчивость, семикарбазон парабензоальдегид.*

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SYNTHESIS OF SEMICARBAZONE PARAOXYBENZO ALDEHYDE WITH MOLYBDENUM

Abstract: *Synthesized semicorbazone paraoxybenzoaldehyde with molybdenum. The composition, personality, methods of synthesis of molecules, semicorbazone paraoxybenzoaldehyde fragment are established. Using methods of vibrational spectroscopy and thermal analysis, methods for coordinating organic ligands, the environment of the central ion and the thermal behavior of the synthesized compounds are proved.*

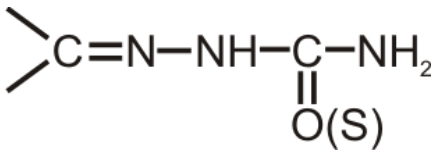
Key words: *Synthesis, composition, individuality, physicochemical methods of analysis, thermal stability, semicarbazone parabenzoaldehyde.*

В современной координационной химии в разделе химии твердого тела металлокомплексы, содержащие в лигандном окружении разные N,O-донорные центры, занимают особое место. Интерес к ним обусловлен тем, что исследование таких металлокомплексов развивается в связи с их использованием в качестве молекулярных магнетиков, каталитических систем, компонентов оптических регистрирующих сред и др. Они являются хорошими моделями для изучения проблемы конкурентной координации в химии комплексных соединений благодаря специфическому действию их окружения на стереохимию полиэдров. Комплексные соединения металлов

обладая рядом специфических свойств, нашли широкое практическое использование во многих отраслях народного хозяйства.

Бурное развитие химии координационных соединений переходных металлов с N, O, S- содержащими органическими лигандами обусловлено весьма широким спектром их действия в качестве биологически активных соединений, аналитических реагентов и катализаторов, используемых в химической промышленности.

Среди вышеупомянутых органических соединений особое место занимают производные семикарбозонов, который содержит фрагменты



Интерес к строению этого лиганда связан с тем, что он способен находиться в различных туатомерных формах. Наличие же во фрагменте разнообразных донорных атомов азота, кислорода, серы и радикалов существенно влияет на процесс комплексообразования и в зависимости от электронной структуры металла происходит стабилизация лигандов той или иной таутомерной формы.

Известно, что производные семикарбазонов участвуют во многих биологических процессах и в зависимости от количества применяемой дозы проявляют стимулирующую и гербицидную активность в семенах низких растений и зерновых культур. С другой стороны, в жизни растений большое значение имеет молибден. Этот элемент играет важную роль при синтезе белка и в обменных процессах соединений азота у растений. Кроме этого, молибден необходим для нормального усвоения атмосферного азота бобвыми культурами. Использование молибдена в сельском хозяйстве вместе с органическими веществами обеспечивает сохранность фосфора в почве на весь период роста растений. В литературе описано что за счет синергетического эффекта, биологическая активность комплексов повышается по сравнению с суммарным биологическим эффектом составляющих исходных компонентов.

Для осуществления синтеза семикарбазона параоксибензальдегида взяли 9,1 г (0,1 моль) семикарбазона и растворили в 50 мл дистиллированной воды и добавили параоксибензальдегида (12,2 г (0,1 моль) в 50 мл этаноле). Температуру реакционной смеси добавили до 85^{o}C при интенсивном перемешивании. Через 3 часа выпал осадок белого цвета, который промыли горячей водой и сушили при комнатной температуре. Выход продукта 86%.

Для синтеза новых координационных соединений состава*[MoO_2(СКn-ОБА-Н)$_2$]Cl_2* нами выбрано2,41 г (0,01 моль) натрия молибдата, который растворили в 50 мл дистиллированной воды. Затем к 50 мл дистиллированной воды добавили 2.90 г (0,01 моль) семикарбазона n-оксибензальдегида.

Смешали оба раствора, нагрели до 80-85ºС. При интенсивном перемешивании. Через 20 мин раствор стал мутным, зелено-голубого цвета с pH=8. Добавляя по капля концентрированную HCl, pH раствора довели до нейтральной, после чего цвет раствора стал коричневым. Осадок промыли и сушили при комнатной температуре. Выход продукта составил 89% от ожидаемого.

Анализ синтезированных соединений на содержания молибдена проводили согласно [9]. Азот определяли по методу Дюма, углерод и водород-сжиганием в токе кислорода. Результаты элементного анализа координационных соединений диоксокомплекса молибдена (VI) с семикарбазонам приведены в *таблице1*. Для установления индивидуальности синтезированных соединений снимали рентгенограммы на установке ДРОН-2,0 с Cu-антикатодом. ИК-спектры поглощения записывали в области 400-4000 $см^{-1}$ на спектрометре AVATAP-360 фирмы “Nicolet”. Термический анализ проводили на дериватографе системы F.Paulik- J.Paulik-L.Erdey со скоростью 9 град.мин, и навеской 0,1 гр. при чувствительности гальванометров Т-900, ТГ-200, ДТА , ДТГ-1/10. Запись осуществляли в атмосферных условиях. Держателем служил платиновый тигель диаметром 10 мм без крышки. В качестве эталона использовали Al_2O_3.

Таблица 1.

Результаты элементного анализа комплексных соединений диоксокомплекса молибдена (VI) с семикарбазоном

Соединения	*Элементы в процентах*									
	Me, %		C, %		H, %		N, %		C1, %	
	Найдено	Вычислено	Найдено	Вычислено	Найдено	Вычислено	Найдено	Вычислено	Найдено	Вычислено
$[MoO_2(СК\text{-}БА\text{-}H)_2]\cdot C1_2$	26.44	25.13	32.68	34.85	2.98	3.69	12.42	11.08	9.11	8.44
$[MoO_2(СКпОБА\text{-}H)_2]C1_2$	19.17	19.43	39.06	39.41	4.81	3.50	17.51	17.91	5.45	6.54

Сравнение межплоскостных расстояний и относительных интенсивностей, диоксокомплекса Mo(VI), семикарбазона, n-оксибензальдегида и их координационные соединения показало, что новый комплексный соединений отличаются между собой, а также от исходных компонентов, следовательно, соединения имеют индивидуальную кристаллическую решетку.

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СУДЕБНО-МЕДИЦИНСКИЕ И МЕДИКО-КРИМИНАЛИСТИЧЕСКИЕ АСПЕКТЫ ПРИ УЧАСТИИ ЭКСПЕРТА В ОСМОТРЕ МЕСТА ПРОИСШЕСТВИЯ

Аннотация. *В этой статье обсуждается вопрос идентификации личности (возраст, пол) и выявления повреждений путем медико-криминалистического изображения следов горных пород и других признаков на теле, одежде и обуви при первичном и дополнительном осмотре места происшествия. Осмотр места происшествия имеет непреложное значение для установления причины наступления смерти. Неоценим осмотр в случае обнаружения трупа с признаками насильственной смерти, особенно с телесными повреждениями, при обнаружении неизвестных лиц, скелетированных трупов. Однако следует учесть, что осмотр места происшествия – это процессуальное действие, совершаемое следственным работником. Эксперт участвует в осмотре места происшествия в качестве врача-специалиста в области судебной медицины, оказывающего помощь следственному работнику.*

Ключевые слова. *Осмотр первичный, осмотр дополнительный, идентификационные признаки.*

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FORENSIC AND MEDICO-FORENSIC ASPECTS WITH THE PARTICIPATION OF AN EXPERT IN THE INSPECTION OF THE SCENE.

Abstract. *This article discusses the issue of personal identification (age, gender) and the identification of damage by medical and forensic depiction of traces of rocks and other signs on the body, clothes and shoes during the initial and additional inspection of the scene. An inspection of the scene is essential to establish the cause of death. An inspection is invaluable if a corpse is found with signs of violent death, especially with bodily injuries, if unknown persons are found, skeletonized corpses. However, it should be noted that the inspection of the scene is a procedural action performed by the investigating officer. The expert participates in the inspection of the scene as a specialist in the field of forensic medicine, providing assistance to the investigator.*

Keywords. *Primary inspection, additional inspection, identification signs.*

Актуальность. Осмотр места происшествия имеет непреложное значение для установления причины наступления смерти. Неоценим осмотр в случае обнаружения трупа с признаками насильственной смерти, особенно с телесными повреждениями, при обнаружении неизвестных лиц, скелетированных трупов. Однако следует учесть, что осмотр места происшествия – это процессуальное действие, совершаемое следственным работником. Эксперт участвует в осмотре места происшествия в качестве врача-специалиста в области судебной медицины, оказывающего помощь следственному работнику. По определению Д.П. Рассейкина и А.А.Леви осмотр места происшествия – это следственное действие, направленное на непосредственное восприятие, изучение обстановки места происшествия, обнаружение, фиксацию, и изъятие различных следов и других вещественных

доказательств в целях выяснения характера происшедшего события, личности преступников, мотивов совершения преступления, а также иных обстоятельств, имеющих значение для дела.

Цель работы. На практике для участия в осмотре места происшествия направляется врач-специалист, имеющий недостаточный опыт в работе на стыке юриспруденции и судебной медицины. Как следствие, специалист в области судебной медицины, как помощник следователя при осмотре, выполняет все общие действия, предусмотренные приказом №520, однако, кажущиеся мелочью детали, выпадают из поля зрения. Особенно это относится к разрешению вопросов, имеющих медико-криминалистическую направленность.

Материалы и методы. Материалом для данной работы являются статьи, касающиеся осмотра места происшествия, действующий в настоящее время приказ №520 Министерства здравоохранения Республики Узбекистан об утверждении «Правил работы врача-специалиста в области судебной медицины при осмотре места происшествия (трупа на месте обнаружения)» и многолетний практический опыт.

Результаты исследования. В ходе первичного осмотра места происшествия из области медицинской криминалистики для врача-специалиста необходимы познания в описании одежды и обуви. Как защитный слой, покрывающий тело человека, одежда первой воспринимает внешнее воздействие. А в силу своей структуры может нести большую информацию как следовоспринимающий объект в сравнении с биологическими тканям и человека. Для фиксации признаков, которые в дальнейшем позволят произвести идентификационные исследования, врачу специалисту необходимо иметь знания о возможностях и методах работы медико-криминалистического отдела, уметь описывать одежду в соответствии с принятым государственным стандартом. Это необходимо потому, что этими стандартами рекомендуется пользоваться следственным работникам при описании одежды трупа во время составления протокола осмотра места происшествия. Порядок описания одежды как вещественного доказательства приводится во множестве справочников, предназначенных для следственных работников. Эти данные имеются и в судебно-медицинской литературе, перекочевав из справочников. Сравнение повреждений на одежде и теле трупа позволяют не только предположить предмет причинения, но восстановить обстоятельство их причинения, даже получить данные о нападавшем. Суть лишь в правильном выявлении этих признаков и полноте фиксации. Тщательный осмотр одежды позволяет отметить идентификационные признаки, позволяющие определить половую принадлежность, возрастной период, характеризующие личность приметы или особенности, род занятий. При этом врач–специалист не должен упускать из виду, что он участвует в осмотре, а не проводит экспертизу.

Другим немаловажным медико-криминалистическим аспектом, возникающим как при первичном, так и при дополнительном осмотрах,

является выявление следов крови. Знание механизма образования следов крови позволит вывить их в доступным и недоступных местах, а подробная вербальная и фотографическая фиксация – определить характер повреждения тканей в глубине раны, взаимоположение потерпевшего и нападавшего, установить количество воздействий. А последующее серологическое исследование позволит установить личностные характеристики.

Ещё одним из направлений при осмотре места происшествия является разрешение вопроса идентификации личности трупа: о половой принадлежности, возрасте, особых приметах и словесном портрете. Установление пола трупа без признаков поздних трупных явлений не вызывает особых затруднений. В случае скелетирования пол определяется по костям, имеющим выраженный половой диморфизм – это череп и таз. При этом следует учесть, что у недостигших половой зрелости лиц установление пола по костям весьма затруднительна.

Возраст обнаруженного неизвестного трупа в протокол осмотра вносится под термином «на вид …-… лет». Однако врач-специалист, в ходе быстрого мыслительного процесса, должен определить этот возрастной период. Для этого могут быть использованы и данные возрастных изменений цвета кожи лица (П.А. Маскин);

Цвет кожи лица	Возраст	Частота встречаемости
Лицо свежее с румянцем	19 – 22	88,5%
Лицо бледное с остатками румянца	23 – 25	93,8%
Лицо бледновато-желтое	26 – 29	91,3%
Лицо бледновато-желтое с начальным землистым оттенком	30 – 34	
Лицо желтовато-землистое	35 – 39	95,2%
Лицо землисто-бледное	40 – 44	91,0%
Лицо землистое	45 – 49	90,0%
Лицо резко землистое	≥ 50	90,0%
		86,6%

сроки поседения волос.

Область поседения	Возраст, годы				
	по П.М. Вроблвс кому	по С.А. При-луц-кому	по Ю.М. Кубиц-кому	по Е.Г. Мотто-ви-лову	Методи ческие рекоменда ции
Височная	к 40	с 35	после 40	45-50	35-50
Все области головы					
Щеки	-	с 50	после 40	50-60	-
Борода	-				
Усы	к 40	с 35	после 40	45-50	-
Подмышечные впадины					
Брови	-	с 35	после 40	45-50	-
Ресницы					
	-	с 50	после 40	45-50	-

	- -	с 50 с 50 -	- - -	- 60-80 -	после 60 после 60 после 60

укорочение ресниц (по данным Кольгуненко И.И.)

в период детства и юности длина их равна	8 – 12 мм
до 40 лет	6 – 8 мм
в 40 - 60 лет	5 – 6 мм
старше 60 лет	3 – 5 мм

сроки появления морщин и складок лица и шеи:

Вид морщин	В.А. Надеждин	С.А. Прилуцкий	П.М. Вроблевский	Ю.М. Кубицкий	С.А. Жданова	Е.Г. Мотовилов		П.А. Маскин
						М	Ж	
Лобные	20	ок. 20	к 40	к 20	ок. 20	18	20	20
Межбровные	-	-	-	-	35	35	35	35
Глазничные: подглазничные	25	ок. 30	> 30	к 30	25-30	30-35	30	-
наружных углов глаз	25-30	25	к 30	к 25	25-35	24-26	25	-
мешки	-	-	-	-	-	55	55	-
Ротовые: Носогубные складки	25-30	-	-	к 20	20	20	24	20
верхней губы	-	55	-	-	-	50	50	50
нижней губы	-	-	-	-	-	60	55	55
Ушные: позади ушные	25-30	25	-	-	25-30	24	25	25
выше мочки	25-30	-	-	-	-	-	-	-
на уровне мочки	25	-	-	-	-	-	-	-
Ниже мочки	30	-	-	-	-	-	-	-
предкозелковые	-	ок.30	-	к 30	ок.30	35	40	30
мочковые	-	-	-	-	-	55	55	55
надкозелковые	-	-	-	-	50-60	-	-	-

Шейные: поперечная циркулярная складка	35-40	-	50	-	-	-	30	35-50
Задние	45-50	35	45-50	-	-	45	50	35-50
Носовые	-	55	-	-	-	55-60	55	55
Щечные	-	-	к 40	-	-	30-40	50	50

Можно использовать краткое изложение особенностей зубов в зависимости от различных возрастных периодов:

25 лет – некоторая стертость эмали жевательной поверхности резцов;

30 лет – небольшое обнажение дентина резцов, начальное появление стирания жевательных зубов;
35 лет – обнажение дентина резцов значительное, дентин темный, бугры жевательных зубов стерты более отчетливо;
40 лет – уменьшение высоты резцов за счет скошенности, обнажение дентина на поверхности жевательных зубов;
45 лет – сношенность резцов и жевательных зубов отчетливая, выпадение некоторых коренных зубов;
50 лет – центральный отдел жевательной поверхности зубов углубляются постепенно; зубы приобретают кратеро-образный характер;
60 лет – жевательная поверхность коренных зубов ровная за чёт значительной сношенности.

Затем остаётся лишь вывести среднестатистический возрастной период.

Для составления словесного портрета В.Н.Звягиным и А.М.Зиминым предложена подробная методика фиксации признаков внешности человека, которая составляется при идентификации личности по прижизненному снимку разыскиваемого и черепу неизвестного лица. Но при осмотре трупа на месте его обнаружения достаточно изложить общие и наиболее броские признаки внешности.

Довольно редким видом обстоятельства смерти, при котором не приглашаются специалисты в области судебной медицины для первичного осмотра места происшествия и трупа, является автомобильная травма. В подобных ситуациях осмотр места происшествия и транспортного средства проводится дополнительно. Участвуют уже эксперты, вооружённые результатами судебно-медицинской экспертизы трупа, медико-криминалистическим исследованием одежды, данными материала дела. Чаще всего при этом участвуют эксперты различных областей знаний при производстве комплексной экспертизы. Для производства данного вида экспертиз привлекаются опытные эксперты.

Выводы. К осмотру места происшествия, как следственному действию, несмотря на наличие в судебной медицинской практике правил участия врачей-специалистов в осмотре места происшествия, отношение у экспертов как к неосновному направлению экспертной деятельности. Однако для разрешения задач, разрешаемых в ходе осмотра, необходимы познания в области «пограничных» наук (криминалистики, антропологии, фотографической технике, философии и другие). В связи с этим было бы желательно в плановом порядке готовить экспертов в области судебной медицины для участия в осмотре места происшествия при различных видах смерти обнаруженного трупа, знакомить с возможностями и методами медико-криминалистических исследований неизвестных трупов

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ОСНОВНЫЕ ВИДЫ СУДЕБНО-БИОЛОГИЧЕСКИХ ИССЛЕДОВАНИЙ ВЕЩЕСТВЕННЫХ ДОКАЗАТЕЛЬСТВ ПО ГОДОВЫМ ОТЧЁТАМ 2022-2023 ГОДОВ В РНИЦСМЭ САМАРКАНДСКОГО ФИЛИАЛА

Аннотация. *В статье рассмотрено и обобщено большой фактический материал об изменениях структуры основных видов судебно-биологических экспертиз с 2022 по 2023 гг. В обобщённом виде проанализирован и продемонстрирован весь объём экспертной работы, выполненной экспертами-биологами судебно-биологического отделения РНИЦСМЭ Самаркандского филиала за 2 года, и отображены соотношения изучаемых показателей. Проведённое исследование позволило выявить изменение количественного соотношения основных видов судебно-биологических экспертиз на протяжении 2-х лет.*

Ключевые слова: *судебно-биологическая экспертиза, вещественные доказательства, преступление, объекты.*

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MAIN TYPES OF FORENSIC BIOLOGICAL STUDIES OF MATERIAL EVIDENCE ACCORDING TO THE ANNUAL REPORTS FOR 2022-2023 IN THE RNICSME SAMARKAND BRANCH.

Abstract. *The article discusses and summarizes a large factual material on changes in the structure of the main types of forensic biological examinations from 2022 to 2023. In a generalized form, the entire volume of expert work performed by biologists of the forensic biological department of the Russian Research Center for Scientific and Technical Research of the Samarkand Branch for 2 years is analyzed*

and demonstrated, and the ratios of the studied indicators are displayed. The study revealed a change in the quantitative ratio of the main types of forensic biological examinations over 2 years.

Key words: *forensic biological examination, material evidence, crime, objects.*

Введение. Использование специальных знаний в расследовании преступлений является одним из приоритетных направлений, способствующих установлению обстоятельств совершенного преступления [1,3,4].

Экспертиза вещественных доказательств биологического происхождения исследует различные объекты биологического происхождения. Особенность следов биологической природы заключается в том, что они малозаметны и с течением времени могут менять свои свойства. При взаимодействии с внешней средой они претерпевают гнилостные и другие деструктивные изменения, утрачивают ряд индивидуализирующих признаков. Кроме того, нередки попытки преступников уничтожить следы на месте происшествия [2,5].

Алгоритмы исследования вещественных доказательств, разработанные экспертами-биологами, доказали свою практичность и жизнеспособность [6].

Целью данного исследования явилось изучение динамики изменений количественных показателей и соотношения основных видов судебно-медицинских биологических экспертиз, выполненных в судебно-биологическом отделении РНИЦСМЭ Самаркандского филиала за период времени с 2022 по 2023 гг.

Материалом для исследования послужили годовые сводные отчёты о деятельности судебно-биологического отделения РНИЦСМЭ Самаркандского филиала.

Для каждого года после сбора и группировки абсолютных величин рассчитывались среднеарифметические данные, путём сравнения которых устанавливалась динамика изучаемых показателей.

Было проанализировано изменение количественных соотношений основных видов судебно-медицинских биологических экспертиз (СМЭ): СМЭ крови, СМЭ выделений, СМЭ волос, СМЭ тканей (мышц, костей, ногтей).

Результаты исследования. В 2022 году в судебно-биологическом отделении РНИЦСМЭ Самаркандского филиала было выполнено 2086 экспертиз и исследований. Структура экспертиз в 2022 году была следующей: СМЭ крови составляли 57%, смэ выделений – 29 %, смэ волос – 5%, СМЭ тканей – 9%.

В 2023 году в судебно-биологическом отделении РНИЦСМЭ Самаркандского филиала было выполнено 2611 судебно-биологических экспертиз и исследований. В 2023 году структура экспертиз выглядела следующим образом: СМЭ крови составляли 60%, СМЭ выделений – 31%,

СМЭ волос – 5%, СМЭ тканей – 4%. В 2023 году, по сравнению с предыдущим годом, возросло количество СМЭ крови (с 57 до 60%), и вместе с тем, увеличилось количество СМЭ выделений (с 29 до 31%), СМЭ тканей уменьшилось (с 9 до 4%), на прежнем уровне осталось только количество СМЭ волос – 6%.

Можно констатировать, что на протяжении двух лет в общей структуре судебно-биологических экспертиз, выполняемых в судебно-биологическом отделении РНИЦСМЭ Самаркандского филиала, превалировали СМЭ крови: от 57% в 2022 годы, до 60 % в 2023-м году.

В течение изученного временного промежутка постепенно возрастало количество СМЭ выделений: от 29% в 2022-м году до 31% в 2023-м году и СМЭ тканей уменьшилось от 9% в 2022-м году до 4% в 2023-м году, наряду с этим стабильно незначительным было количество СМЭ волос. Кроме того, было рассчитано распределение судебно-биологических экспертиз на протяжении 2-х лет по назначившим учреждениям.

Судебно-биологические экспертизы выполняются по постановлениям следователей МВД, прокуратуры, судов, следователей военной прокуратуры, а также по запросам адвокатов и заявлениям граждан. Кроме того, часть исследований производится на основании направлений экспертов некоторых структурных подразделений РНИЦСМЭ Самаркандского филиала.

В 2022 году по постановлениям следователей прокуратуры было выполнено 22% от всего количества судебно-биологических экспертиз, по постановлениям следователей МВД – 25%, по направлениям экспертов РНИЦСМЭ Самаркандского филиала – 49%, по постановлениям, определениям и запросам прочих организаций – 2 % экспертиз.

В 2023 году по постановлениям следователей прокуратуры было произведено 26% от всего количества судебно-биологических экспертиз, по постановлениям следователей МВД – 16%, по направлениям экспертов РНИЦСМЭ Самаркандского филиала – 55% и по постановлениям, определениям и запросам прочих организаций – 3 %. По сравнению с предыдущим годом, в 2023 году увеличилось количество экспертных заключений, выполненных для прокуратуры (с 22 до 26%), уменьшилось –для органов МВД (с 25 до 16%), а также возросло количество исследований, произведённых по направлениям экспертов РНИЦСМЭ Самаркандского филиала (с 49 до 53%).

Около половины экспертных документов – Заключений и Актов исследования вещественных доказательств во все изученные десятилетние периоды выполнялись по направлениям экспертов РНИЦСМЭ Самаркандского филиала.

Количество судебно-биологических экспертиз, выполненных в судебно-биологическом отделении РНИЦСМЭ Самаркандского филиала по постановлениям и определениям судов, постановлениям следователей военной прокуратуры, запросам адвокатов, заявлениям граждан, на протяжении двух лет, оставалось стабильно небольшим – от 6 до 7%.

Вывод. В целом, на протяжении всего изученного промежутка времени (с 2022 по 2023 гг.) подавляющее большинство судебно-биологических экспертиз (исследований) выполнялось по постановлениям следственных органов (МВД и прокуратуры) и экспертов РНИЦСМЭ Самаркандского филиала, при этом их общая структура оставалась достаточно постоянной: в среднем, СМЭ крови составляли 61,9%, СМЭ выделений – 27,8%, СМЭ волос – 6%, СМЭ тканей – 4,37%.

Таким образом, проведенное исследование позволило обобщить и проанализировать большой фактический материал о количественных соотношениях различных видов судебно-биологических экспертиз, произведённых в РНИЦСМЭ Самаркандского филиала для различных ведомств и учреждений, что позволило выявить динамику изменения их структуры на протяжении двух лет.

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СУДЕБНО-МЕДИЦИНСКАЯ ЭКСПЕРТИЗА ВНЕЗАПНОЙ СМЕРТИ У ДЕТЕЙ И ЛИЦ МОЛОДОГО ВОЗРАСТА

Аннотация. *В статье изучено внезапная смерть, ее структуры, причин, поиск патоморфологических критериев и в конечном счете постановка судебно-медицинского диагноза являются рутинной работой судебно-медицинского эксперта. В качестве причин внезапной сердечной смерти (ВСС) лиц молодого возраста, по данным различных, авторов называют различные виды патологии миокарда, миокардиты, гипертрофическую кардиомиопатию, стеноз аорты, разрыв аорты, разрыв грудной аорты при болезни Марфана, острую коронарную недостаточность. У внезапно умерших подростков причинами ВСС были хронические миокардиты (недиагностированные при жизни), синдром удлиненного QT, спазм коронарных артерий при отсутствии атеросклероза, аномалии коронарных артерий, разрыв аневризм аорты. Установлено, что основным механизмом наступления ВС в молодом возрасте является нарушение ритма сердца с развитием фибрилляции желудочков или асистолии. В молодом возрасте, очевидно, основные причины ВСС представлены другими заболеваниями сердца: гипертрофическая кардиомиопатия, синдром WPW, синдром удлиненного QT, аномалии развития сердца.*

Ключевые слова: *внезапная смерть, причина, молодой возраст, судебно-гистологическое исследование.*

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FORENSIC EXAMINATION OF SUDDEN DEATH IN CHILDREN AND YOUNG ADULTS

Abstract. *The article studied sudden death, its structures, causes, the search for pathomorphological criteria and ultimately making a forensic diagnosis are the routine work of a forensic expert. According to various authors, the causes of sudden cardiac death (SCD) in young people are various types of myocardial pathology, myocarditis, hypertrophic cardiomyopathy, aortic stenosis, aortic rupture, rupture of the thoracic aorta in Marfan disease, and acute coronary insufficiency. In suddenly deceased adolescents, the causes of SCD were chronic myocarditis (undiagnosed during life), elongated QT syndrome, coronary artery spasm in the absence of atherosclerosis, coronary artery abnormalities, rupture of aortic aneurysms. It has been established that the main mechanism of the onset of VS at a young age is a violation of the heart rhythm with the development of ventricular fibrillation or asystole. At a young age, obviously, the main causes of SCD are represented by other heart diseases: hypertrophic cardiomyopathy, WPW syndrome, elongated QT syndrome, cardiac abnormalities.*

Key words: *sudden death, cause, young age, forensic histological examination.*

Актуальность. Изучение внезапной смерти, ее структуры, причин, поиск патоморфологических критериев и в конечном счете постановка судебно-медицинского диагноза являются рутинной работой судебно-медицинского эксперта. Статистические показатели внезапной смерти — это показатели, отражающие демографический, экономический, социальный и политический уровень развития страны [1,2].

Масштабные исследования эпидемиологии, причин, предвестников внезапной сердечной смерти (ВСС) проводились в конце XX века во многих странах [7].

Судебно-медицинское исследование внезапной смерти (ВС) в обязательном порядке назначается и проводится в отношении лиц молодого возраста (до 39 лет), так как любая неожиданная, внезапная смерть в молодом возрасте вызывает подозрение на насильственный характер: употребление алкогольсодержащих, наркотических, психоактивных веществ и травматический характер смерти. Судебно-медицинское исследование случаев ВС молодых лиц требует иного методологического подхода для поиска основной причины смерти, так как выраженного поражения сосудов атеросклеротическим процессом, более характерного для возрастной группы старше 40 лет, при секционном исследовании не выявляется. В качестве причин внезапной сердечной смерти (ВСС) лиц молодого возраста, по данным разчных авторов [3,4,5], называют различные виды патологии миокарда, миокардиты, гипертрофическую кардиомиопатию, стеноз аорты, разрыв аорты, разрыв грудной аорты при болезни Марфана, острую коронарную недостаточность. У внезапно умерших подростков причинами ВСС были

хронические миокардиты (недиагностированные при жизни), синдром удлиненного QT, спазм коронарных артерий при отсутствии атеросклероза, аномалии коронарных артерий, разрыв аневризм аорты. Установлено, что основным механизмом наступления ВС в молодом возрасте является нарушение ритма сердца с развитием фибрилляции желудочков или асистолии [6]. Морфологические диагностические критерии наступления смерти по аритмическому генезу неспецифичны, и судебно-медицинский эксперт не вправе ставить нарушение ритма как причину смерти без наличия ЭКГ, выполненной перед наступлением смерти.

Цель исследования: изучение эпидемиологических данных ВС, структуры и причин ВС по данным показателей смертности населения Самаркандской области.

Материал и методы исследования. В течение 1 года мы исследовали 566 случаев скоропостижной смерти от сердечных причин на базе Саранского судебно–медицинского отделения Республиканского бюро судебно–медицинской экспертизы Республики Узбекистан.

Количество молодых людей (до 35 лет) в этой группе составило 22 человека (4 %). В 17 случаях смерть наступила при свидетелях, неожиданно,

и ее наступлению предшествовала потеря сознания в течение 1 часа с начала клинических проявлений, имела место внезапная смерть. Вскрытие трупов производилось по методу Шора Г.В., оценка производилась макроскопическим методом с последующим судебно–гистологическим исследованием. Судебно-гистологическое исследование производилось методом световой микроскопии препаратов после проводки в парафин, окраски гематоксилин – эозином. Концентрацию алкоголя в крови определяли газохроматографическим методом с использованием внутренних стандартов (концентрация этанола в крови 0,5 – 1,49 ммоль/л расценивалась как соответствующая легкой степени алкогольного опьянения, концентрация 1,5 – 2,49 ммоль/л – как соответствующая средней степени, 2,5 – 2,99 моль/л – соответствующая тяжелой степени алкогольного опьянения).

Результаты: В исследуемой группе было 16 (73%) мужчин и 6 (17 %) женщин. В 17 случаях смерть наступила при свидетелях в общественных местах и дома (на улице, в кафе, дома). Ухудшение, приведшее к смерти, развилось мгновенно в 15 (88 %) случаях (пациенты не успевали предъявить жалоб); в течение 1 часа – в 2 (12 %) случаях, пациенты успели предъявить жалобы на боли в области сердца.

Физическая нагрузка непосредственно перед смертью отмечалась у 7 (41 %) человек (в т.ч. женщина 20 лет, умершая на сцене во время танца), курение

– у 10 (45 %), в т.ч. непосредственно перед смертью

— у 3 (18%) человек, прием алкоголя незадолго до смерти — у 3 (18%) человек.

При исследовании катамнеза из доступной медицинской документации выявлены:

• врожденный синдром удлиненного QT – у 2 пациента;
• эпизоды мерцательной аритмии – у 1 пациента;
• обмороки в катамнезе – у 1 пациента.

При судебно – медицинском исследовании в данной группе в 5 (23 %) случаях был установлен диагноз: "Острая сердечно – сосудистая недостаточность. Ишемическая болезнь сердца", в 17 (77 %) случаях диагноз был: “Острая сердечно – сосудистая недостаточность”.

На секции у 13 (59 %) человек имелась гипертрофия миокарда левого желудочка (увеличение массы сердца и толщины стенки левого желудочка) атеросклеротическое поражение аорты и коронарных артерий выявлено у 4 (18 %) человек в исследуемой группе (стенозов не было). Тромбозов коронарных артерий, рубцовых зон и зон “свежего” повреждения в миокарде не обнаружено. В 2 случаях обнаружено аномальное отхождение левой коронарной артерии от правого венечного синуса. В 1 случае обнаружены добавочные поперечные хорды — по одной в левом и в правом желудочках.

При микроскопическом исследовании миокарда в исследуемой группе у 16 (73 %) человек выявлена распространенная фрагментация мышечных волокон миокарда (в т.ч., у 13 — в сочетании с волнообразной деформацией кардиомиоцитов), у 11 (50 %) человек – диффузный сетчатый кардиосклероз в сочетании с периваскулярным кардиосклерозом некоронарного генеза, у 3 (13 %) человек – липоматоз стромы миокарда.

Алкоголь в крови обнаружен у 4 (18 %) человек:
• в концентрации, соответствующей легкой степени опьянения – у 1;
• в концентрации, соответствующей средней степени опьянения – у 2;
• в концентрации, соответствующей тяжелой степени опьянения – у 1.

Вывод. В популяции большая часть случаев ВСС представлена больными, у которых имелась ИБС или ВСС стала ее первым проявлением. И только 10–15% случаев ВКС обусловлены другими заболеваниями сердца: кардиомиопатии (гипертрофическая, аритмогенная правожелудочковая, дилатационная); синдром удлиненного QT, синдром WPW, некоторые аномалии развития (мышечные мостики, отхождение коронарных артерий от коронарного синуса или легочной артерии); некоторые пороки сердца (аортальный стеноз, пролапс митрального клапана). В молодом возрасте, очевидно, основные причины ВСС представлены другими заболеваниями сердца: гипертрофическая кардиомиопатия, синдром WPW, синдром удлиненного QT, аномалии развития сердца. На это указывают и зарубежные авторы. Отдельное место среди факторов риска занимают курение, употребление алкоголя и физическая нагрузка.

Полученные данные свидетельствуют о необходимости дифференцированного подхода к разработке путей профилактики ВСС в разных возрастных группах с учетом основных причин и факторов риска.

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СУДЕБНО-МЕДИЦИНСКАЯ ЭКСПЕРТИЗА «БАМПЕР-ПЕРЕЛОМА» ПРИ АВТОТРАВМЕ

Аннотация. *На земном шаре значительно увеличилось число транспортных травм из-за резкого возрастания количества всех видов транспорта во второй половине XX столетия. В современных условиях среди всех летальных исходов по результатам ВОЗ смертность от механической травмы занимает 3-е место. По всему миру травматизм в результате дорожно-транспортных происшествий имея постоянную тенденции к увеличению, остается основной причиной летальности и инвалидности людей почти во всех возрастных категориях, при котором явно преобладает люди самого трудоспособного возраста - 18-60 лет. «Бампер-перелом» - переломы костей голени или бедра с образованием характерного отломка, возникающие при ударе бампером движущейся автомашины. Локализация повреждений от воздействия бампера зависит от скорости автомобиля, высоты расположения относительно поверхности дороги. Медико-криминалистические методы исследования дают возможность установления локализации приложения силы и направления воздействия орудия травмы.*

Ключевые слова: *автотравма, длинные трубчатые кости, травматизм, нижние конечности.*

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FORENSIC EXAMINATION OF "BUMPER FRACTURE" IN CASE OF AUTO INJURY

Abstract. *On the globe, the number of transport injuries increased significantly due to a sharp increase in the number of all types of transport in the second half of the 20th century. In modern conditions, among all deaths, according to the WHO results, mortality from mechanical injury ranks 3rd. Around the world, injuries due to road accidents with a constant upward trend remain the main cause of mortality and disability of people in almost all age categories, with a clear predominance of people of the most working age - 18-60 years. "Bumper fracture" - fractures of the bones of the lower leg or thigh with the formation of a characteristic fragment that occur when the bumper hits a moving car. The localization of damage from the impact of the bumper depends on the speed of the car, the height of the location relative to the road surface. Medico-forensic research methods make it possible to establish the localization of the application of force and the direction of exposure to the instrument of injury.*

Key words: *autotrauma, long tubular bones, injuries, lower limbs.*

Актуальность. На земном шаре значительно увеличилось число транспортных травм из-за резкого возрастания количества всех видов транспорта во второй половине XX столетия. В современных условиях среди всех летальных исходов по результатам ВОЗ смертность от механической травмы занимает 3-е место. Автодорожные происшествия считаются наиболее частыми причинами механической травмы [2]. Ежегодно в Самаркандской области регистрируются сотни случаев причинения повреждений в результате дорожно-транспортных происшествий.

Уголовный кодекс Республики Узбекистан УК РУзб. предусматривает уголовную ответственность за нарушение безопасности движения и

эксплуатации транспортного средства, нарушение правил по обеспечению безопасной работы транспорта (ст. 266, 268 УК РУзб.) [7].

По всему миру травматизм в результате дорожно-транспортных происшествий имея постоянную тенденции к увеличению, остается основной причиной летальности и инвалидности людей почти во всех возрастных категориях, при котором явно преобладает люди самого трудоспособного возраста - 18-60 лет.

В Республике Узбекистане реализуется определенные меры, направленные на развитие медицинской отрасли, адаптацию системы здравоохранения к требованиям мировых стандартов, в том числе и, направленные на ранее выявление различных патологических состояний и травматизма.

Основными задачами процесса судебно-медицинской экспертизы в отношении пострадавших лиц при автомобильной травме, являются установления характера, давности, прижизненности, степени тяжести повреждений и причины смерти, а также обоснования механизма формирования повреждений по установления местоположения пострадавших или погибших в момент дорожно-транспортных происшествий.[4].

Все повреждения, образующиеся при разных видах автомобильной травмы, в зависимости от их диагностической ценности условно принято делить на специфические, характерные и нехарактерные. К специфическим относятся контактные повреждения, образовавшиеся в месте соприкосновения частей транспорта с телом. В таких повреждениях отображаются форма, рисунок, а иногда и размеры (полностью или частично) определенных частей транспорта. К характерным относятся такие повреждения, механизм образования которых соответствует механизму и фазам определенного вида травмы. Нехарактерные - все остальные повреждения, не имеющие признаков, описанных в двух предыдущих группах [1].

«Бампер-перелом» - переломы костей голени или бедра с образованием характерного отломка, возникающие при ударе бампером движущейся автомашины [3]. Локализация повреждений от воздействия бампера зависит от скорости автомобиля, высоты расположения относительно поверхности дороги.

Поэтому в судебно-медицинской службе Республики Узбекистан предусмотрены особенности проведения экспертизы трупа в случае транспортной травмы [6], заключающиеся при внутреннем исследовании трупа в обязательном исследовании всего костного скелета и изъятии перелома для дополнительного исследования, зарисовке схематического расположения и направления линий и плоскостей перелома, обязательном изъятии для лабораторного исследования кожи, части хряща, детальном и полном исследовании внутренних органов с повреждениями.

Цель исследования. Установление места приложения силы и направления её воздействия по переломам трубчатых костей нижних конечностей.

Материалы и методы исследования. Используются данные исследования фрагмента трубчатых костей с перечнем применяемых методик и способа определения локализации участка приложения травмирующей силы случая из практики: 14 сентября 2023 года на территории Булунгурского района был сбит гражданин Н. при пересечении слева направо автомобильной трассы М-39, и скончался на месте происшествия.

Результаты исследования и их обсуждение. При судебно-медицинской экспертизе трупа основной акцент исследования был направлен на изучение телесных повреждений и переломов (рис. 1, 2).

При разрезе мягких тканей левой голени обнаружен фрагментарно-оскольчатый перелом большеберцовой и малоберцовой кости в средней трети в 21,0 см от подошвенной поверхности стопы со смещением отломков относительно друг друга по оси с крупноочаговыми темно-красного цвета кровоизлияниями в окружающие мягкие ткани.

На правой голени обнаружен фрагментарно-оскольчатый перелом большеберцовой и малоберцовой кости в средней трети в 24,0 см от подошвенной поверхности стопы со смещением отломков относительно друг друга по оси с крупноочаговыми кровоизлияниями в окружающие мягкие ткани темно-красного цвета.

Для медико-криминалистического исследования изъят фрагмент правой большеберцовой кости.

Исследование проведено методами: 1) подготовительный; 2) установление целого по части; 3) восстановительный; 4) сравнительно-анатомический; 5) визуальный; 6) измерительный; 7) стереомикроскопический; 8) обзорное фотографирование; 9) макрофотографирование; 10) репеража; 11) копирования; 12) составление схем; 13) векторографический.

Правая большеберцовая кость представлена четырьмя отломками. Оба конца фрагмента ограничены поперечными плоскостями распила. При сравнении фотографии фрагмента с изображением большеберцовой и малоберцовой кости (рисунки 184 и 185 страницы 113 тома 1 «Большеберцовая кость и малоберцовая кость, правые; вид спереди» из «Атласа анатомии человека» Синельникова Р.Д., Синельникова Я.Р.) установлено, что повреждение располагается на границе верхней и средней трети кости. Перелом занимает всю протяжённость предоставленного фрагмента, имеет два отломка: размерами 2,13х0,87см на задней поверхности кости, и протяженностью перелома 5,07см по оси кости на наружной поверхности с переходом на внутреннюю и заднюю поверхности кости. На внутренней поверхности кости протяжённость перелома составляет 8,10см; поперечную направленность имеет у внутреннего края кости на расстоянии 6,52см от верхнего конца фрагмента, соответственно условного циферблата

часов линия перелома ориентирована на цифры 3 и 10, доходит до середины плоскости кости, края неровные, волнистой формы, не сопоставимые, с дефект костной ткани на участке размерами 0,40х1,80см; поверхности излома бугристые, косо-отвесной направленности (зона первичного перелома), на нижнем крае у ориентированного на цифру 10 конца отходят короткие трещины, ориентированные на цифру 8, а затем веерообразно расходящиеся три линии перелома с множественными трещинами, расположенные в сегменте 7-11 часов, ограничивают участок треугольной формы с основанием на переднем крае кости, края переломов неровные с сопоставимыми краями пилообразного характера, нижняя линия перелома, ориентированная на цифру 8, извилисто-дугообразной формы со сколом компактного слоя шириной 0,40-0,55см, поверхности излома бугристые, отвесной направленности на косо-продольных линиях перелома и скошенных на косо-поперечных участках (зона срезывающих напряжений). На задней поверхности кости протяжённость перелома по оси кости составляет 11,89см, имеет поперечную направленность от внутреннего края кости на протяжении трети ширины, ориентированная на цифры 3 и 9, края неровные, не сопоставимые, с дефектом костной ткани размерами 0,50х1,02см, поверхности излома бугристые, косо-отвесной направленности (зона первичного перелома); на остальном протяжении по направлению к межкостному краю линии перелома и трещины веерообразно разветвляются в сегменте 1-5 часов, из которых верхняя трещина волнисто-линейная и является продолжением линии перелома, а нижняя трещина дугообразной формы упирается изогнутым на цифру 4 концом в продольную линию перелома с неровными сопоставимыми краями и отвесными бугристыми поверхностями излома, доходящего до нижней плоскости распила (зона срезывающих напряжений). На наружной поверхности кости протяжённость перелома 9,51см: в верхней части участка от переднего края кости косо-продольно располагается линия перелома, перешедшая с внутренней поверхности кости, и доходящая до верхней плоскости распила, и косо-продольной направленности трещина, ориентированная на цифру 11, с ответвлением на цифру 10 и разветвлением на цифры 8 и 11, не доходящими до межкостного края кости, описанные перелом и трещины располагаются в сегменте 10-11 часов; в нижней части участка располагаются две линии перелома ломаной формы, расстояние между выстоящими вверх и вниз участками 5,07см, ориентированы на цифры 2 и 8, края неровные, зубчатого и крупнозубчатого характера, поверхности излома бугристые, скошенной направленности, по краю средней линии перелома скол компактного слоя на участке треугольной формы размерами 1,21х1,23см, на нижней линии перелома в средней части скол компактного слоя неправильной веретеновидной формы размерами 0,97х1,34см и у переднего края кости – 0,73х0,13см (зона долома). С одномасштабных снимков перелома на поверхностях большеберцовой кости получены копии линий и участков: перелома – толстыми линиями; трещин – узкими линиями; дефектов костной ткани – сплошной заливкой; сколов – шахматной

штриховкой, которые сгруппированы, обозначены края и поверхности кости. На развёрнутом изображении перелома ромбом выделена зона долома, противоположные вершины ромба соединены прямыми, место пересечения диагоналей на наружной поверхности кости обозначено крестом.

Фото 1. Вид спереди фрагментов правой большеберцовой и малоберцовой костей покойного Н. Снято с фотоспышкой

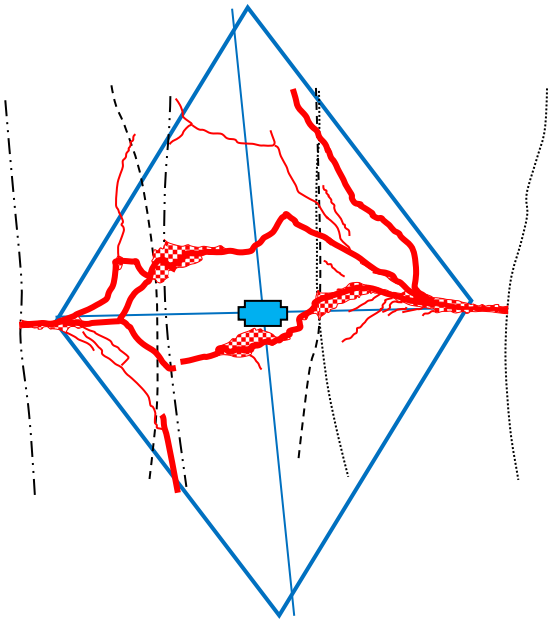

Рис.1.
На развёрнутом изображении многооскольчатого перелома правой большеберцовой кости покойного Н. векторографическое построение для определения места приложения травмирующей силы (отмечено крестом).

Правая малоберцовая кость представлена двумя отломками, общая длина которых после сопоставления 10,36см; трубчатой формы, округло-треугольного сечения. Как указано в направлении, верхний конец имеет плоскость перелома размерами 1,49х1,47см, нижний – плоскость распила размерами 1,81х1,25см, линия наружной и задней поверхности дугообразно-линейные, а внутренней поверхности – в форме фигурной скобки; обращённый вперёд край более заострённый. При сравнении фотографии фрагмента с изображением большеберцовой и малоберцовой кости (рисунки 184 и 185 страницы 113 тома 1 «Большеберцовая кость и малоберцовая кость,

правые; вид спереди» и рисунке «Атласа анатомии человека» Синельникова Р.Д., Синельникова Я.Р.) установлено, что верхний повреждённый конец фрагмента соответствует верхней трети кости, а перелом в средней части фрагмента располагается на границе верхней и средней трети кости. 1) Перелом на верхнем конце фрагмента представлен только нижним отломком, имеет протяжённость 2,47см. На внутренней поверхности кости протяжённость перелома составляет 1,66см; поперечную направленность имеет от межкостного края на протяжении одной трети ширины поверхности, ориентирован на цифры 3 и 9, волнисто-линейной формы края и бугристая отвесной направленности поверхность излома (зона первичного перелома); затем линия перелома направляется на цифру 10 с неровным волнистым краем, местами мелкозубчатого характера, поверхность излома у переднего края принимает скошенную направленность; от места перегиба линии перелома на цифру 8 отходит извилисто-линейная трещина (зона срезывающих напряжений). На задней поверхности кости протяжённость перелома по оси кости составляет 2,47см, линия перелома у межкостного края дугообразно выпуклая вверх, занимает около половины ширины поверхности, концами ориентирована на цифры 8 и 5, край мелковолнистый, неровный, поверхность излома бугристая, отвесная (зона первичного перелома); на остальном протяжении по направлению к заднему краю кости отмечается разветвление переломом на цифру 1 с загибом конца у заднего края кости на цифру 5, и трещиной на цифру 5 извилистой формы с закруглением конца на цифру 1, край перелома извилисто-линейный, неровный, поверхность излома бугристая, отвесная (зона срезывающих напряжений). На наружной поверхности кости протяжённость перелома 0,76см, линия извилистая, концами ориентирована на цифры 2 и 8, край зубчатый, поверхность излома бугристая, скошенная и отвесная (зона долома). С одномасштабных снимков верхнего перелома на поверхностях малоберцовой кости получены копии линий: перелома – толстыми линиями; трещин – узкими линиями; дефектов костной ткани – сплошной заливкой; сколов – шахматной штриховкой, которые сгруппированы, обозначены края и поверхности кости. На развёрнутом изображении перелома ромбом выделена зона долома, противоположные вершины ромба соединены прямыми, место пересечения диагоналей на наружной поверхности кости обозначено крестом. 2) Перелом на средней части фрагмента является полным, косо-поперечным, поверхность перелома винтообразная. На внутренней поверхности кости перелом располагается на расстоянии 3,46см от верхнего конца фрагмента, имеет протяжённость 2,21см; у межкостного края на протяжении около половины ширины поверхности линия перелома одиночная, концами ориентирована на цифры 4 и 9, края неровные, сопоставление не достигается из-за дефекта костной ткани размерами 0,34х0,65см, по верхнему краю скол компактного слоя размерами 0,23х0,28см, поверхности излома бугристые, отвесной направленности (зона первичного перелома); далее перелом дугообразно загибается на цифру 8, а от места его отхождения трещина, ориентированная

на цифру 10, которая, не доходя до переднего края кости концом загибается на цифру 11, края перелома неровные, мелковолнистые, поверхности излома бугристые, по мере удаления от места разветвления переходят от отвесной направленности к скошенной (зона срезывающих напряжений). На задней поверхности кости протяжённость перелома по оси кости составляет 1,48см; у межкостного края кости на протяжении трети ширины поверхности линия перелома поперечной направленности, переходит в дефект костной ткани размерами 1,31х0,99см, ориентированный на цифру 5, и переходящий в извилистую линию перелома, ориентированную на цифру 4 до заднего края кости; края неровные со сколом компактного слоя шириной 0,33-0,61см, имеющим пологие бугристые поверхности излома (зона срезывающих напряжений). На наружной поверхности кости протяжённость перелома 1,34см, линия извилистая, концами ориентирована на цифры 5 и 9, края в виде зубцов с закруглёнными вершинами, поверхности излома бугристые, у переднего края кости отвесно-скошенной направленности, а у заднего края кости принимают скошенную направленность, и по краям отмечается скол компактного слоя кости (зона долома). С одномасштабных снимков среднего перелома на поверхностях малоберцовой кости получены копии линий: перелома – толстыми линиями; трещин – узкими линиями; дефектов костной ткани – сплошной заливкой; сколов – шахматной штриховкой, которые сгруппированы, обозначены края и поверхности кости. На развёрнутом изображении перелома ромбом выделена зона долома, противоположные вершины ромба соединены прямыми, место пересечения диагоналей на наружной поверхности кости обозначено крестом.

Фото 2. Многооскольчатый перелом правой малоберцовой кости покойного Н. на внутренней поверхности.

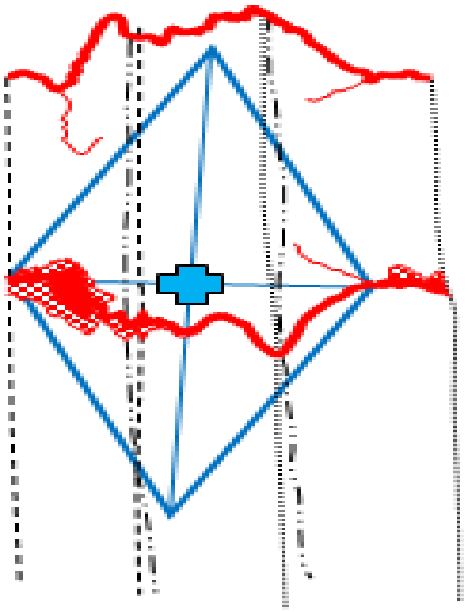

Рис.2. На развёрнутом изображении двух переломов правой малоберцовой кости покойного Н. векторографическое построение для определения места приложения травмирующей силы (отмечено крестом).

Таким образом, на предоставленном фрагменте правой большеберцовой кости полный многооскольчатый перелом на границе верхней и средней трети с признаками растяжения на внутреннем крае кости и признаками сжатия на наружной поверхности; на предоставленном фрагменте правой малоберцовой кости два полных перелома на уровне верхней трети и на границе верхней и средней трети, оба имеющие признаки растяжения на межкостном крае кости и признаки сжатия на наружной поверхности.

В результате исследования пришли к следующему выводу, у покойного Н. имелись полный многооскольчатый перелом на границе верхней и средней трети правой большеберцовой кости, и два полных перелома правой малоберцовой кости на уровне верхней трети и на границе верхней и средней трети, образовавшиеся по механизму изгиба, а перелом правой малоберцовой кости в верхне-средней трети с элементами кручения, в результате однократного ударного воздействия тупого твёрдого предмета по наружным поверхностям правой голени и направлением действия травмирующей силы справа налево.

Вывод.

1. Медико-криминалистические методы исследования дают возможность установления локализации приложения силы и направления воздействия орудия травмы.

2. Механизмами образования повреждений длинных трубчатых костей были растяжение на внутреннем крае кости и сжатие на наружной поверхности.

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МЕТОДЫ РАЗВИТИЯ КОМПЕТЕНЦИЙ ПРЕПОДАВАТЕЛЕЙ ПРОФЕССИОНАЛЬНОГО ОБРАЗОВАНИЯ НА ОСНОВЕ ЦИФРОВЫХ ТЕХНОЛОГИЙ

Аннотация*: в условиях стремительного развития цифровых технологий возрастает необходимость совершенствования профессиональных компетенций преподавателей системы профессионального образования. Данная статья посвящена анализу методов, направленных на развитие цифровых и педагогических компетенций педагогов, работающих в учреждениях профессионального образования Узбекистана. Освещены современные подходы к цифровой трансформации образовательного процесса, такие как внедрение онлайн-курсов, использование интерактивных платформ, цифровых симуляторов и программного обеспечения для проектного обучения. Представлены результаты исследований и практического опыта по формированию у педагогов устойчивых цифровых навыков, способности применять ИКТ в образовательной деятельности, а также адаптировать учебные материалы под требования цифровой среды. Статья подчеркивает значимость систематического повышения квалификации, цифровой грамотности и поддержки со стороны образовательных учреждений.*

Ключевые слова: *цифровые технологии, профессиональное образование, педагогические компетенции, цифровая трансформация, цифровая грамотность, повышение квалификации, ИКТ, педагогика, онлайн-обучение, цифровые платформы.*

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METHODS OF DEVELOPING THE COMPETENCIES OF PROFESSIONAL EDUCATION TEACHERS BASED ON DIGITAL TECHNOLOGIES

Abstract*: In the context of the rapid development of digital technologies, the need to improve the professional competencies of teachers in the professional education system is increasing. This article is devoted to the analysis of methods aimed at developing the digital and pedagogical competencies of teachers working in vocational education institutions of Uzbekistan. Modern approaches to the digital*

transformation of the educational process, such as the implementation of online courses, the use of interactive platforms, digital simulators, and software for project-based learning, are highlighted. The results of research and practical experience on the formation of sustainable digital skills in teachers, the ability to apply ICT in educational activities, as well as the adaptation of educational materials to the requirements of the digital environment, are presented. The article emphasizes the importance of systematic professional development, digital literacy, and support from educational institutions.

***Keywords**: digital technologies, vocational education, pedagogical competencies, digital transformation, digital literacy, professional development, ICT, pedagogy, online learning, digital platforms.*

Цифровизация всех сфер общества, включая систему образования, требует от преподавателей профессионального образования не только технической осведомленности, но и способности применять цифровые инструменты в обучении. В условиях Узбекистана, где осуществляется активная модернизация образования, важным направлением становится развитие профессиональных компетенций педагогов с учетом современных цифровых вызовов. Преподаватели должны владеть навыками работы с образовательными платформами, электронными ресурсами, уметь организовывать дистанционное обучение и применять методы цифровой педагогики.

В настоящее время правительство республики реализует комплексные меры по внедрению цифровых решений в систему профессионального обучения. В частности, принимаются стратегические документы, предусматривающие развитие цифровой инфраструктуры, подготовку цифровых образовательных ресурсов, а также организацию курсов повышения квалификации преподавателей.

Актуальность данной темы обусловлена необходимостью подготовки педагогических кадров, способных эффективно использовать возможности цифровой среды, развивать у обучающихся цифровую грамотность и профессиональные навыки, востребованные на рынке труда. Цель статьи — определить эффективные методы развития компетенций преподавателей профессионального образования в условиях цифровой трансформации. Исследование опирается на анализ теоретических подходов и практического опыта внедрения цифровых инструментов в образовательный процесс.

Развитие компетенций преподавателей в условиях цифровой трансформации включает в себя комплексную работу по формированию как технических, так и педагогических навыков. В первую очередь, это касается цифровой грамотности, которая включает умение пользоваться онлайн-платформами, цифровыми образовательными ресурсами, системами управления обучением (LMS), а также способность критически оценивать информацию и интегрировать цифровые инструменты в учебный процесс.

Одним из действенных методов развития данных компетенций является проведение специализированных курсов повышения квалификации. Такие курсы направлены на обучение преподавателей работе с платформами дистанционного обучения (например, Moodle, Google Classroom, Edmodo), инструментами визуализации (Prezi, Canva), программами для создания тестов и интерактивных заданий (Kahoot, Quizizz, Mentimeter). Практика показывает, что регулярное участие в семинарах и тренингах способствует повышению мотивации преподавателей к использованию ИКТ в преподавании.

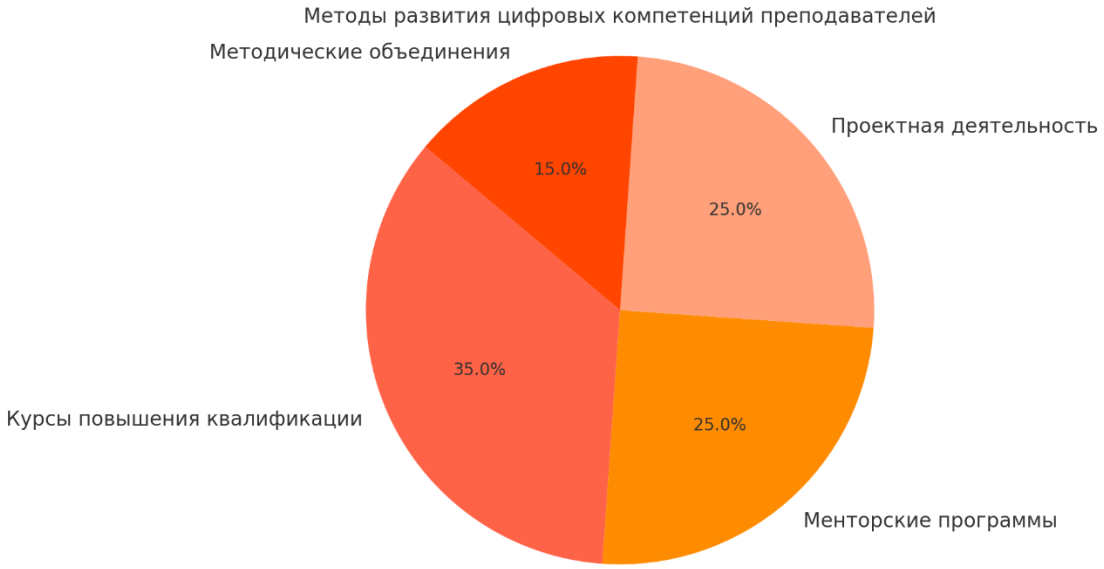

Рис. 1. Распределение методов развития цифровых компетенций преподавателей профессионального образования

Другим важным направлением является внедрение менторских программ, в рамках которых опытные преподаватели делятся практиками цифрового преподавания с менее опытными коллегами. Такая форма наставничества позволяет в краткие сроки повысить уровень цифровых компетенций на базе конкретных педагогических кейсов.

Также важную роль играют методические объединения, в которых обсуждаются вопросы применения цифровых решений, анализируются конкретные уроки, даются рекомендации по улучшению.

Эффективным считается также проектный метод обучения преподавателей, в рамках которого они разрабатывают и реализуют собственные цифровые образовательные продукты — видеолекции, интерактивные пособия, виртуальные лаборатории. Это способствует не только освоению цифровых инструментов, но и творческому подходу к их использованию.

Таким образом, формирование цифровых компетенций требует системного и поэтапного подхода, включающего институциональную

поддержку, организацию непрерывного образования, обмен опытом и развитие мотивации.

Заключение

Современные реалии диктуют необходимость ускоренного развития цифровых компетенций у преподавателей профессионального образования. Переход к цифровой образовательной среде требует не только владения техническими средствами, но и глубокого понимания методик их применения в учебном процессе. Представленные в статье методы — курсы повышения квалификации, менторские программы, проектная деятельность и участие в методических объединениях — позволяют системно и эффективно решать задачи цифровой трансформации образования.

Особое значение приобретает поддержка со стороны образовательных учреждений и государства, создание условий для постоянного профессионального роста педагогов. Развитие цифровых компетенций напрямую связано с качеством профессионального образования, подготовкой конкурентоспособных кадров и устойчивостью образовательной системы к внешним вызовам.

Таким образом, только при комплексном подходе к обучению и переобучению преподавателей с учетом цифровых изменений возможно достижение высокого уровня образовательных результатов и успешная реализация стратегии цифровизации образования в Узбекистане.

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ПРОБЛЕМЫ РЕАЛИЗАЦИИ ГОСУДАРСТВЕННЫХ ПРОГРАММ

Аннотация. *В статье рассматриваются предметный анализ аудита государственных программ, как части государственного финансового контроля. Анализируются основные проблемы, выявленные в процессе аудита государственных программ. Дается оценка итогов реализации государственных программ в 2023 году.*

Ключевые слова: *госпрограмма, государственная программа, аудит, финансовый аудит (контроль).*

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PROBLEMS OF IMPLEMENTATION OF STATE PROGRAMS

Abstract. *The article examines the substantive analysis of the audit of state programs as part of state financial control. The main problems identified during the audit of state programs are analyzed. An assessment of the results of the implementation of state programs in 2023 is given.*

Key words: *state program, state program, audit, financial audit (control).*

По официальным данным Счетной палаты Российской Федерации в 2023 году было реализовано 50 госпрограмм по восьми функциональным направлениям: сохранение населения, здоровье и благополучие людей; возможности для самореализации и развития талантов; комфортная и безопасная среда для жизни; достойный эффективный труд и успешное предпринимательство; развитие науки, промышленности и технологий; цифровая трансформация; сбалансированное региональное развитие; обеспечение национальной безопасности и международного сотрудничества[138].

В рамках данной статьи проведен комплексный анализ эффективности расходования финансового обеспечения государственных программ, включающего бюджетные ассигнования, внебюджетные источники финансирования, а также налоговые расходы Российской Федерации.

[138] Счетная палата Российской Федерации. Официальный сайт [Электронный ресурс]. – Режим доступа: https://ach.gov.ru/ (дата обращения: 15.05.2025).

Анализ исполнения бюджетных ассигнований, направленных на реализацию открытой части государственных программ, реализованных в 2023 году представлен на рис.1.

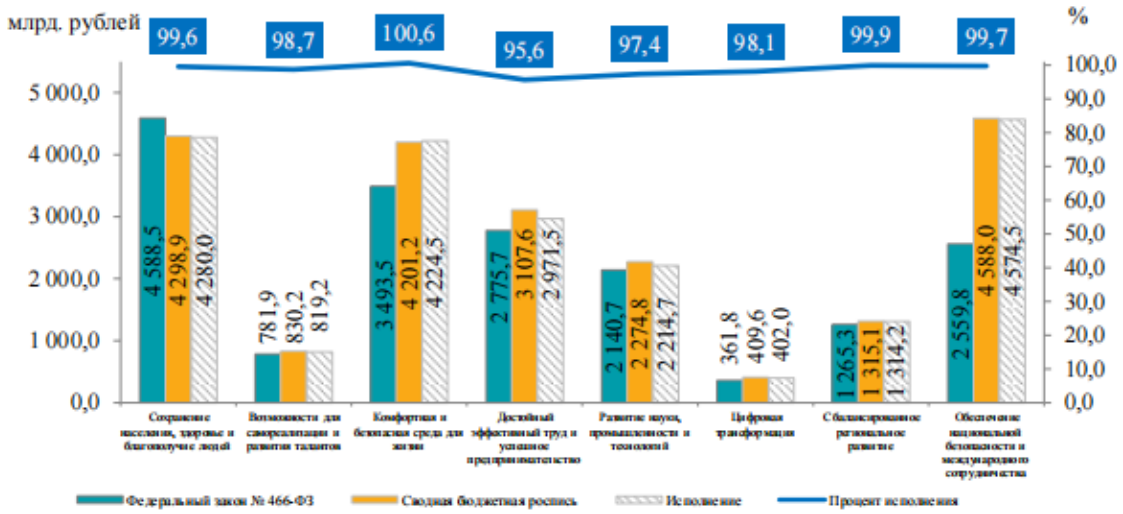

Рисунок 1 - Исполнение бюджетных ассигнований, направленных на реализацию открытой части государственных программ, реализуемых в 2023 году

Проведенный анализ данных о расходах по реализуемым государственным программам и источникам их финансирования позволил сделать вывод о том, что наибольшее увеличение показателей сложилось по двум функциональным направлениям: «обеспечение национальной безопасности и международного сотрудничества» и «комфортная и безопасная среда для жизни».

По направлению реализации государственных программ «обеспечение национальной безопасности и международного сотрудничества» отмечено увеличение показателей сводной бюджетной росписи на 2 028 176,3 млн. рублей, что в процентном соотношении равняется 79,2 %. По направлению «комфортная и безопасная среда для жизни» сложилось увеличение показателей на 20,3 %, что составляет 707 698,4 млн. рублей.

Необходимо отметить, что обозначенные изменения составляют 89,5% от всего количества изменений, внесенных в государственные программы, реализуемые в 2023 году.

Непосредственный анализ государственных программ позволяет выделить три госпрограммы, по которым сложилось наибольшее увеличение показателей сводной бюджетной росписи: «Обеспечение обороноспособности страны», «Обеспечение доступным и комфортным жильем и коммунальными услугами граждан Российской Федерации», «Развитие транспортной системы».

В 2023 году доля изменений по данным государственным программам составила 82,3% от общего объема изменений по всем реализуемым программам или 2 516 730,2 млн. рублей. Указанные изменения, по данным Счетной палаты РФ, в первую очередь обусловлены перераспределением зарезервированных бюджетных ассигнований.

По направлению реализации «Достойный эффективный труд и успешное предпринимательство» отмечено 95,6% фактического исполнения запланированных расходов. Данный показатель уровня кассового исполнения наименьший среди всех направлений реализации государственных программ в 2023 году.

Немаловажное значение при формировании бюджетов государственных программ уделяется привлечению внебюджетных источников финансирования. Однако, необходимо отметить, что их наличие не является обязательным.

Анализ паспортов государственных программ, реализуемых в 2023 году позволяет сделать вывод о том, что внебюджетные источники финансирования в размере 3 093 801,9 млн. рублей были предусмотрены на реализацию мероприятий 18 госпрограмм.

Необходимо отметить, что утверждённые паспортами госпрограмм объемы финансирования из внебюджетных источников в течение года значительно корректировались, как в сторону увеличения, так и уменьшения, путем внесения соответствующих изменений.

Наибольшее увеличение сложилось по госпрограммам «Комплексное развитие сельских территорий» – в 14,9 раза (на 41 384,0 млн. рублей), «Научно-технологическое развитие Российской Федерации» – на 18,8 % (на 17 839,7 млн. рублей), «Развитие лесного хозяйства» – на 10,2 % (на 4 525,7 млн. рублей) и «Развитие транспортной системы» – на 5,3 % (на 49 136,6 млн. рублей).

В результате изменений объем внебюджетных источников, предусмотренный паспортами госпрограмм, уменьшен на 14,5 % (на 447 060,4 млн. рублей) и составил 2 646 741,6 млн. рублей.

Вышеизложенные факты позволяют сделать вывод о наличии в системе управления государственными программами существенных проблем в части планирования показателей госпрограмм. В первую очередь это высокий риск невыполнения установленных параметров по внебюджетным источникам финансирования и, как следствие, замещение внебюджетного финансирования бюджетным.

Говоря о финансировании мероприятий государственных программ, необходимо отметить наличие в утвержденных паспортах госпрограмм общего объема налоговых расходов Российской Федерации.

Вместе с тем Методическими рекомендациями по мониторингу государственных программ Российской Федерации, утвержденными приказом Минэкономразвития России от 21 апреля 2022 г. № 218, формирование в годовых отчетах о ходе реализации государственной программы информации

о результатах оценки эффективности налоговых расходов Российской Федерации не предусмотрено. На основании чего, соответствующими исполнителями была исключена информация налоговых расходов Российской Федерации из Сводного годового доклада о ходе реализации государственных программ, что препятствует проведению грамотного мониторинга.

Наряду с обозначенными результатами и выводами авторского исследования, существенной проблемой разработки и реализации государственных программ выступает несоответствие реальных объемов их финансового обеспечения основным положениям Федерального закона № 466-ФЗ, программная структура которого разработана в строгом соответствии с Бюджетным кодексом Российской Федерации[139].

Таким образом, анализ финансового обеспечения государственных программ позволил выявить наличие следующих проблем:

– высокий риск невыполнения установленных параметров по внебюджетным источникам финансирования и, как следствие, замещение внебюджетного финансирования бюджетным;

– отсутствие при аудите государственных программ оценки эффективности налоговых расходов Российской Федерации;

– параметры финансового обеспечения ряда государственных программ не соответствуют бюджетным ассигнованиям, утвержденным Федеральным законом № 466-ФЗ.

Использованные источники:

1. Федеральный закон «О федеральном бюджете на 2023 год и на плановый период 2024 и 2025 годов» от 05.12.2022 N 466-ФЗ (последняя редакция) / [Электронный ресурс]. Режим доступа: https://www.consultant.ru/document/cons_doc_LAW_433298 / (дата обращения: 15.05.2025).

2. Счетная палата Российской Федерации. Официальный сайт [Электронный ресурс]. – Режим доступа: https://ach.gov.ru/ (дата обращения: 15.05.2025).

[139]Федеральный закон «О федеральном бюджете на 2023 год и на плановый период 2024 и 2025 годов» от 05.12.2022 N 466-ФЗ (последняя редакция) / [Электронный ресурс]. Режим доступа: https://www.consultant.ru/document/cons_doc_LAW_433298 / (дата обращения: 15.05.2025).

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ПОВЫШЕНИЕ ЭФФЕКТИВНОСТИ АУДИТА ГОСУДАРСТВЕННЫХ ПРОГРАММ

Аннотация. *В статье рассматриваются основные проблемы, связанные с аудитом реализации государственных программ Российской Федерации, а также предлагаются пути их решения. Обосновываются направления повышения эффективности аудита госпрограмм, предлагаются мероприятия и дается описание содержательной части данных мероприятий, а также оценка ожидаемых результатов.*

Ключевые слова: *госпрограмма, государственная программа, аудит, финансовый аудит (контроль).*

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IMPROVING THE EFFICIENCY OF AUDIT OF STATE PROGRAMS

Abstract. *The article examines the main problems associated with the audit of the implementation of state programs of the Russian Federation, and suggests ways to solve them. The directions for increasing the effectiveness of the audit of state programs are substantiated, measures are proposed and a description of the substantive part of these measures is given, as well as an assessment of the expected results.*

Key words: *state program, state program, audit, financial audit (control).*

Действующая на современном этапе концепция государственного бюджетного планирования, основанная на принципах программно-целевого подхода к управлению, позволяет должным образом контролировать распределение и расходование выделяемых денежных средств.

В установленные сроки посредством аудита проводятся проверки эффективности реализации государственных программ, которые выступают функциональными задачами Счетной Палаты РФ.

Анализ основных положений заключения Счетной палаты РФ по итогам реализации государственных программ в 2023 году позволил выявить следующие проблемы в части финансового обеспечения[140]:

[140] Счетная палата Российской Федерации. Официальный сайт [Электронный ресурс]. – Режим доступа: https://ach.gov.ru/ (дата обращения: 15.05.2025).

– высокий риск невыполнения установленных параметров по внебюджетным источникам финансирования и, как следствие, замещение внебюджетного финансирования бюджетным;

– отсутствие при аудите государственных программ оценки эффективности налоговых расходов Российской Федерации;

– недостатки при формировании отдельных отчетов о ходе реализации структурных элементов госпрограмм за 2023 год в части отражения результатов, а также их увязки с финансовым обеспечением;

– применение одинаковых наименований результатов без указания уникального кода в печатной форме отчета приводит к невозможности корректного и однозначного сопоставления сведений о выполнении (достижении) мероприятий (результатов) и сведений об использовании финансового обеспечения на их достижение;

– параметры финансового обеспечения ряда государственных программ не соответствуют бюджетным ассигнованиям, утвержденным Федеральным законом № 466-ФЗ;

– упрощенный порядок внесения изменений в паспорта государственных программ, в т.ч. в ГИИС «Электронный бюджет».

На современном этапе общественного развития, характеризующегося высокой степенью экономической нестабильности и сложной мировой общественно-политической ситуацией, задачей первостепенной важности выступает достижение устойчивости государства. В свою очередь устойчивое государство способны обеспечить преимущественно эффективно функционирующие органы государственной власти и управления, которые оптимально используют имеющиеся государственные ресурсы в целях достижения высокого качества жизни населения и результативного решения социально-экономических и политических проблем.

Основным инструментом социально-экономического развития и поддержания стабильной общественно-политической ситуации в настоящее время в нашем государстве выступают государственные программы, выступающие частью программно-целевого подхода, ставшего с недавних пор элементом государственного управления.

Реализация государственных программ гарантирует социальное обеспечение и социальную поддержку граждан, развитие системы образования, поддержку отрасли культуры, развитие системы здравоохранение и т.д. и т.п., а, следовательно, обеспечение высокого качества жизни населения.

Таким образом, проверка эффективности и результативности реализации государственных программ, является необходимым элементом системы государственного управления.

Аудит государственных программ, выступающий одним из видов данной оценки, призван определять экономичность использования

бюджетных средств, а также обоснованность и целевое расходование привлеченных внебюджетных источников финансирования.

С учетом выявленных проблем, автором статьи предлагаются мероприятия по повышению эффективности аудита государственных программ, которые сгруппированы по четырем основным направлениям, непосредственно касающихся трансформации системы управления государственными программами:

– оценка результативности реализации госпрограммы;
– финансовый аудит (контроль) госпрограмм;
– аудит эффективности госпрограмм;
– аудит соответствия госпрограмм.

В качестве основного мероприятия, нацеленного на повышение эффективности проводимой оценки результативности реализации госпрограмм, проводимой Счетной Палатой РФ при аудите госпрограмм, в рамках выпускной квалификационной работы, предлагается расширить перечень показателей данной оценки и дополнить соответствующие положения методических рекомендаций по разработке и реализации госпрограмм, утвержденных приказом Министерства экономического развития, пунктом об обязательной оценке эффективности налоговых расходов Российской Федерации.

Данная мера позволит обеспечить комплексную оценку государственных программ, а также установить более жесткий контроль за оптимальным расходованием государственных ресурсов в части налоговых расходов Российской Федерации.

В качестве меры совершенствования финансового аудита (контроля) государственных программ предлагается дополнить методические рекомендации по разработке и реализации государственных программ обязательным пунктом об увязки результатов госпрограмм с финансовым обеспечением, а именно дополнить форму годового отчета о реализации государственной программы пунктом, отражающим взаимосвязь достижения поставленных результатов с финансовым обеспечением.

Данная мера позволит в полной мере обеспечить выполнение комплексной оценки государственных программ, обеспечение контроля за оптимальным расходованием государственных ресурсов, обеспечение обоснованности и целесообразности запланированных результатов госпрограмм, целесообразности выделения конкретного объема бюджетных средств на реализацию той или иной государственной программы.

В качестве основной трансформации системы управления государственными программами, затрагивающей от части аудит эффективности госпрограмм, в рамках данной выпускной квалификационной работы предлагается установить ответственность должностных лиц за неэффективную реализацию госпрограмм, в т.ч. госпрограмм субъектов РФ. Персональная ответственность позволит повысить эффективность реализации

государственных программ, в первую очередь, выражающуюся в оптимальном использовании государственных ресурсов. Соответствующие изменения целесообразно утвердить отдельным нормативно-правовым актом.

В свою очередь предлагаемое дополнение методических рекомендаций по разработке и реализации государственных программ обязательным пунктом о недопустимости замещения запланированных внебюджетных источников финансирования бюджетными средствами позволит исключить путаницу показателей государственных программ.

Как уже было отмечено ранее, версионности в ГИИС «Электронный бюджет» не позволяет однозначно определить версию паспорта конкретной госпрограммы на начало года реализации, отдельные версии госпрограмм действуют в один и тот же период актуальности версии.

Таким образом, актуальной версией паспорта госпрограммы располагает только исполнитель государственной программы, в то время как у контролирующих органов полностью отсутствует возможность оценки положений данного документа.

В качестве одной из проблем, препятствующих эффективному аудиту государственных программ, было отмечено несоответствие параметров финансового обеспечения ряда государственных программ бюджетным ассигнованиям, утвержденным Федеральным законом № 466-ФЗ, что в свою очередь указывает на неправильное отображение бюджетных средств, направленных на реализацию госпрограмм и исключает их адекватную и полную оценку. Дополнение методических рекомендаций по разработке и реализации государственных программ обязательным положением, регламентирующим порядок согласования паспортов государственных программ, включающего проверку соответствия параметров финансового обеспечения ряда государственных программ бюджетным ассигнованиям, утвержденным Федеральным законом № 466-ФЗ позволит обеспечить полноту, обоснованности и достоверность направляемых на реализацию государственной программы бюджетных ассигнований[141].

Как было отмечено во втором разделе выпускной квалификационной работы, в настоящее время количество изменений, вносимых в паспорта государственных программ не имеет каких-либо ограничений, что в большинстве случаев приводит к занижению плановых показателей, снижению реальной эффективности реализации государственных программ.

В качестве решения данной проблемы предлагается отменить возможность внесения изменений в методику расчета показателей на протяжении всего периода реализации государственной программы, а также ограничить количество возможных изменений паспорта государственной

[141] Федеральный закон «О федеральном бюджете на 2023 год и на плановый период 2024 и 2025 годов» от 05.12.2022 N 466-ФЗ (последняя редакция) / [Электронный ресурс]. Режим доступа: https://www.consultant.ru/document/cons_doc_LAW_433298 / (дата обращения: 15.05.2025).

программы до одного (внесение изменений в начале отчетного периода - единократно).

Таким образом, предложенные мероприятия позволят не только повысить эффективность аудита государственных программ, но и улучшить отдельные показатели качества жизни населения посредством оптимального контроля за расходованием бюджетных средств.

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ТЎЛҚИНЛИ ЭЛЕКТР СТАНЦИЯЛАРДАН ЭЛЕКТР ЭНЕРГИЯ ҲОСИЛ ҚИЛИШ

Аннотация: *Тўлқинли электр станцияларини қуришдан иқтисодий фойдаларни баҳолашда шуни ёдда тутиш керакки, тўлқинлар пайтида сув сатҳининг енг кучли тебранишлари чекка денгизларга хосдир. Ушбу қирғоқларнинг аксарияти кам аҳоли яшайдиган жойларда жойлашган бўлиб, иқтисодий фаолият ва электр энергиясини оммавий истеъмол қилиш жойларидан сезиларли даражада олиб ташланган.*

Калит сўзлар: *Энергия тежаш, энергия самарадорлиги, энергетик тежамкорлик, ишончли фаолият, энергия сарфи, қайта тикланувчи энергия манбалари.*

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ELECTRICITY FROM ELECTRIC POWER PLANTS

Abstract: *Assessing the economic benefits of the construction of wave power plants, it should be borne in mind that the marginal seas are characterized by strong fluctuations in the water level of the sleeves during tides. Many of these shores are located in sparsely populated areas and are significantly removed from areas of economic activity and mass electricity consumption.*

Keywords: *energy saving, energy efficiency, energy saving, reliable activity, energy consumption, renewable energy sources.*

Тўлқинли электр станцияларини қуришдан иқтисодий фойдаларни баҳолашда шуни ёдда тутиш керакки, тўлқинлар пайтида сув сатҳининг енг кучли тебранишлари чекка денгизларга хосдир. Ушбу қирғоқларнинг аксарияти кам аҳоли яшайдиган жойларда жойлашган бўлиб, иқтисодий фаолият ва электр энергиясини оммавий истеъмол қилиш жойларидан сезиларли даражада олиб ташланган. Бундан ташқари, у ҳисобга йил фасллари электр стансиялари чиқимларни қоплаш анча жозибадор сезиларли уларнинг қуввати ортади сифатида бўлади, деб ҳақиқатни олиш зарур 5 ва яна ҳам шундай учун 15 million квт. Бироқ, мамлакатнинг чекка ҳудудларида бундай миқёсдаги тўлқин станцияларини қуриш жуда кўп пул талаб қилади ва ҳар доим ҳам тавсия етилмайди.

Шамол ер юзасининг қуёш нурлари ва атмосферанинг пастки қатламлари томонидан нотекис исиши натижасида ҳосил бўлади-ҳаво

массалари ер юзасига ва ундан юқорига, ердан 7-12 км баландликда ҳаракатлана бошлайди. Шундай қилиб, шамол энергияси қуёш фаолиятининг натижасидир. Шамол турбиналарини жойлаштириш учун енг фойдали жойлар — шамол энергиясини конвертация қилиш учун тузилмалар — қирғоқ чизиқлари (қирғоқдан камида 10-12 км), ҳароратнинг пасайиши ва кучли ва барқарор шамол (камида 5 м/ с).

Дунёда энг кенг тарқалгани учта пичоқли ва горизонтал айланиш ўқига ега шамол турбиналарининг дизайни. Бундан ташқари, вертикал айланиш ўқи бўлган шамол турбиналарини қуришга уринишлар қилинган, чунки улар ишлашни бошлаш учун жуда паст шамол тезлигини талаб қиладиган афзалликларга ега деб ишонилади. Бироқ, тормоз механизми билан боғлиқ муаммолар туфайли бундай шамол генераторлари шамол енергетикаси саноатида амалий тақсимланмаган.

Шамол ёрдамида электр энергиясини ишлаб чиқариш бир қатор афзалликларга ега:

1. зарарли чиқиндиларсиз екологик тоза ишлаб чиқариш;
2. мавжудлиги;
3. амалий битмас-туганмаслик.

Бироқ, шамол энергияси бир қатор камчиликларга ега:

1. нотекис энергия чиқиши;
2. энергияни сақлаш зарурати;
3. шовқиннинг ифлосланиши ва телевизор сигналини қабул қилиш учун шовқин мавжудлиги;
4. қушлар ва ҳашаротларнинг учишига аралашиш;
5. шамол турбиналарининг юқори нархи;
6. батареяларни ўрнатиш учун катта майдонларга ехтиёж.

Россиянинг умумий шамол салоҳияти 26000 млн.t., техник салоҳияти 2000 млн.t. ва иқтисодий салоҳияти 10 млн.t.

Шамол энергиясининг салоҳияти Россия ҳудудида нотекис тақсимланган. 2-иловада келтирилган Россия Федерациясининг шамол ресурслари харитасида шамол энергияси манбаларининг ер сатҳидан 50 метр баландликда жойлашганлиги кўрсатилган. Ушбу харитага кўра, шамолнинг ўртача тезлиги Barents, Кара, Bering ва Охоцк денгизлари бўйлаб тўпланган. Шамол тезлиги нисбатан юқори бўлган ҳудудларга (5-6 м/с) шимолда Шарқий Сибир, Чукчи ва Лаптев денгизлари ва Шарқда Япония денгизи қирғоқлари киради. Ўрта ва қуйи Volga минтақаларида, Уралсда, Ғарбий Сибирнинг дашт минтақаларида ва Байкал кўлида ҳам муҳим манбалар мавжуд.

Россиянинг аксарият ҳудудларида кундузи шамол тезлиги тунга қараганда юқори ва бу фарқлар қишда камроқ сезилади. Россиянинг аксарият минтақаларида ўртача шамол тезлигининг йиллик йўналиши аҳамияциз ва 1 дан 4 м/с гача ўзгариб туради, ўртача 2-3 м/с. юқори амплитудалар

Россиянинг Европа қисмининг марказида, Шарқий ва Ғарбий Сибирда, шунингдек узоқ Шарқда кузатилади. улар 4 м/с га етади. Россиянинг Европа

қисмининг жануби-Шарқий ва жануби-ғарбий қисмида ва Марказий Сибирда йиллик 2 м/с дан кам амплитудалар кузатилади.

Тўлқинли гидроенергетика - тўлқинлар энергиясини бошқа энергия турларига айлантириш.

Гелгит электр станциялари (ИЕС) юқори оқим ва паст оқим пайтида сув сатҳининг максимал фарқлари билан қирғоқларда жойлашган. Песнинг ишлаш принципи қуйидагича: кўрфазда унинг бир қисмини океандан ажратиб турадиган тўғон қурилмоқда. Юқори оқим ва паст оқим пайтида тўғоннинг турли томонларида сув сатҳининг пасайиши ҳосил бўлади, сув тўғон орқали пастки сатҳга қараб оқади ва бир йўналишда (юқори оқимда), сўнгра бошқа томонда (паст оқимда) айланадиган тескари турбиналарни ҳаракатга келтиради.

Маълумки, республикамизда иқтисодиёт барқарор ўсишини таъминлашга ва аҳолининг фаровонлик даражасини оширишга, ёқилғи-энергетика ресурсларига бўлган талаб – эҳтиёжни узлуксиз қаноатлантиришга қаратилган нефть – газ, электр энергетика, кўмир, кимё, қурилиш индустриясини ривожлантиришнинг узоқ муддатли стратегияси амалга оширилмоқда. Шу билан бирга, ёқилғи – энергетика тармоғининг мавжуд қувватлари энергия ресурсларига ортиб бораётган талаб-эҳтиёжни тўлиқ даражада таъминламаяпти, мамлакатимиз иқтисодиётининг энергия сарфи ҳажми ривожланган мамлакатларнинг ўртача кўрсаткичидан анча юқоридир. Ҳозирги вақтда асосан гидроэлектростанциялар ишлаб чиқараётган қайта тикланувчи энергия манбалари ҳиссасига мамлакатда ишлаб чиқарилаётган электр энергияси умумий ҳажмининг атиги ўн фоизи тўғри келмоқда. Ниҳоятда катта салоҳият мавжуд бўлишига қарамасдан, қуёш ва шамол сингари қайта тикланувчи энергия манбаларининг имкониятларидан тўлиқ даражада фойдаланилмаяпти.

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ШАМОЛ ВА ТЎЛҚИНЛИ ЭНЕРГИЯ САНОАТИ

Аннотация: *Шамол энергиясининг салоҳияти Россия ҳудудида нотекис тақсимланган. Тўлқинли электр станцияларини қуришдан иқтисодий фойдаларни баҳолашда шуни ёдда тутиш керакки, тўлқинлар пайтида сув сатҳининг енг кучли тебранишлари чекка денгизларга хосдир. Ушбу қирғоқларнинг аксарияти кам аҳоли яшайдиган жойларда жойлашган бўлиб, иқтисодий фаолият ва электр энергиясини оммавий истеъмол қилиш жойларидан сезиларли даражада олиб ташланган.*

Калит сўзлар: *Энергия тежаш, энергия самарадорлиги, энергетик тежамкорлик, ишончли фаолият, энергия сарфи, қайта тикланувчи энергия манбалари.*

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WIND AND WAVE ENERGY INDUSTRY

Abstract: *The potential of wind energy is unevenly distributed on the territory of Russia. When assessing the economic benefits from building wave power plants, it should be borne in mind that the sleeve strong fluctuations of the water level during waves are characteristic of remote seas. Most of these shores are located in sparsely populated areas and have been significantly removed from areas of economic activity and mass electricity consumption.*

Keywords: *energy saving, energy efficiency, energy saving, reliable activity, energy consumption, renewable energy sources.*

Тўлқинли электр станцияларини қуришдан иқтисодий фойдаларни баҳолашда шуни ёдда тутиш керакки, тўлқинлар пайтида сув сатҳининг енг кучли тебранишлари чекка денгизларга хосдир. Ушбу қирғоқларнинг аксарияти кам аҳоли яшайдиган жойларда жойлашган бўлиб, иқтисодий фаолият ва электр энергиясини оммавий истеъмол қилиш жойларидан сезиларли даражада олиб ташланган. Бундан ташқари, у ҳисобга йил фасллари электр стансиялари чиқимларни қоплаш анча жозибадор сезиларли уларнинг қуввати ортади сифатида бўлади, деб ҳақиқатни олиш зарур 5 ва яна ҳам шундай учун 15 миллион квт.

Шамол ер юзасининг қуёш нурлари ва атмосферанинг пастки қатламлари томонидан нотекис исиши натижасида ҳосил бўлади-ҳаво массалари ер юзасига ва ундан юқорига, ердан 7-12 км баландликда

ҳаракатлана бошлайди. Шундай қилиб, шамол энергияси қуёш фаолиятининг натижасидир. Шамол турбиналарини жойлаштириш учун енг фойдали жойлар — шамол энергиясини конвертация қилиш учун тузилмалар — қирғоқ чизиқлари (қирғоқдан камида 10-12 км), ҳароратнинг пасайиши ва кучли ва барқарор шамол (камида 5 м/ с).

Дунёда энг кенг тарқалгани учта пичоқли ва горизонтал айланиш ўқига ега шамол турбиналарининг дизайни. Бундан ташқари, вертикал айланиш ўқи бўлган шамол турбиналарини қуришга уринишлар қилинган, чунки улар ишлашни бошлаш учун жуда паст шамол тезлигини талаб қиладиган афзалликларга ега деб ишонилади. Бироқ, тормоз механизми билан боғлиқ муаммолар туфайли бундай шамол генераторлари шамол енергетикаси саноатида амалий тақсимланмаган.

Шамол ёрдамида электр энергиясини ишлаб чиқариш бир қатор афзалликларга ега:

1. зарарли чиқиндиларсиз екологик тоза ишлаб чиқариш;
2. мавжудлиги;
3. амалий битмас-туганмаслик.

Бироқ, шамол энергияси бир қатор камчиликларга ега:

1. нотекис энергия чиқиши;
2. энергияни сақлаш зарурати;
3. шовқиннинг ифлосланиши ва телевизор сигналини қабул қилиш учун шовқин мавжудлиги;
4. қушлар ва ҳашаротларнинг учишига аралашиш;
5. шамол турбиналарининг юқори нархи;
6. батареяларни ўрнатиш учун катта майдонларга ехтиёж.

Россиянинг умумий шамол салоҳияти 26000 млн.t., техник салоҳияти 2000 млн.t. ва иқтисодий салоҳияти 10 млн.t.

Шамол энергиясининг салоҳияти Россия ҳудудида нотекис тақсимланган. 2-иловада келтирилган Россия Федерациясининг шамол ресурслари харитасида шамол энергияси манбаларининг ер сатҳидан 50 метр баландликда жойлашганлиги кўрсатилган. Ушбу харитага кўра, шамолнинг ўртача тезлиги Barents, Кара, Bering ва Охоцк денгизлари бўйлаб тўпланган. Шамол тезлиги нисбатан юқори бўлган ҳудудларга (5-6 м/с) шимолда Шарқий Сибир, Чукчи ва Лаптев денгизлари ва Шарқда Япония денгизи қирғоқлари киради. Ўрта ва қуйи Volga минтақаларида, Уралсда, Ғарбий Сибирнинг дашт минтақаларида ва Байкал кўлида ҳам муҳим манбалар мавжуд.

Россиянинг аксарият ҳудудларида кундузи шамол тезлиги тунга қараганда юқори ва бу фарқлар қишда камроқ сезилади. Россиянинг аксарият минтақаларида ўртача шамол тезлигининг йиллик йўналиши аҳамияциз ва 1 дан 4 м/с гача ўзгариб туради, ўртача 2-3 м/с. юқори амплитудалар

Россиянинг Европа қисмининг марказида, Шарқий ва Ғарбий Сибирда, шунингдек узоқ Шарқда кузатилади. улар 4 м/с га етади. Россиянинг Европа қисмининг жануби-Шарқий ва жануби-ғарбий қисмида ва Марказий Сибирда йиллик 2 м/с дан кам амплитудалар кузатилади.

Тўлқинли гидроенергетика - тўлқинлар энергиясини бошқа энергия турларига айлантириш.

Гелгит электр станциялари (ИЕС) юқори оқим ва паст оқим пайтида сув сатҳининг максимал фарқлари билан қирғоқларда жойлашган. Песнинг ишлаш принципи қуйидагича: кўрфазда унинг бир қисмини океандан ажратиб турадиган тўғон қурилмоқда. Юқори оқим ва паст оқим пайтида тўғоннинг турли томонларида сув сатҳининг пасайиши ҳосил бўлади, сув тўғон орқали пастки сатҳга қараб оқади ва бир йўналишда (юқори оқимда), сўнгра бошқа томонда (паст оқимда) айланадиган тескари турбиналарни ҳаракатга келтиради.

Маълумки, республикамизда иқтисодиёт барқарор ўсишини таъминлашга ва аҳолининг фаровонлик даражасини оширишга, ёқилғи-энергетика ресурсларига бўлган талаб – эҳтиёжни узлуксиз қаноатлантиришга қаратилган нефть – газ, электр энергетика, кўмир, кимё, қурилиш индустриясини ривожлантиришнинг узоқ муддатли стратегияси амалга оширилмоқда. Шу билан бирга, ёқилғи – энергетика тармоғининг мавжуд қувватлари энергия ресурсларига ортиб бораётган талаб-эҳтиёжни тўлиқ даражада таъминламаяпти, мамлакатимиз иқтисодиётининг энергия сарфи ҳажми ривожланган мамлакатларнинг ўртача кўрсаткичидан анча юқоридир. Ҳозирги вақтда асосан гидроэлектростанциялар ишлаб чиқараётган қайта тикланувчи энергия манбалари ҳиссасига мамлакатда ишлаб чиқарилаётган электр энергияси умумий ҳажмининг атиги ўн фоизи тўғри келмоқда. Ниҳоятда катта салоҳият мавжуд бўлишига қарамасдан, қуёш ва шамол сингари қайта тикланувчи энергия манбаларининг имкониятларидан тўлиқ даражада фойдаланилмаяпти.

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МУҚОБИЛ ЭНЕРГЕТИКАНИ РИВОЖЛАНТИРИШ ЧОРА ТАДБИРЛАРИ

Аннотация: *1974 йил давомида нефт нархи тўрт баравар ошди ва Ғарб мамлакатлари инқироз сабабларини тушуниб, муқобил енергия соҳасида тадқиқотларни бошладилар, уларнинг стратегик мақсади миллий енергия хавфсизлигини таъминлаш еди. Олимларнинг иши ҳар хил турдаги муқобил манбалар устида олиб борилди, ягона аниқ чекловчи омил маълум ҳудудларнинг табиий-иқлим шароити эди.*

Калит сўзлар: *Энергия тежаш, энергия самарадорлиги, энергетик тежамкорлик, ишончли фаолият, энергия сарфи, қайта тикланувчи энергия манбалари.*

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ALTERNATIVE ENERGY DEVELOPMENT MEASURES

Abstract: *During 1974, oil prices quadrupled, and Western countries, understanding the causes of the crisis, began research in the field of alternative yenergy, the strategic goal of which was to ensure the safety of national yenergy. The work of scientists was carried out on various types of alternative sources, the only obvious limiting factor was the natural-climatic conditions of certain regions.*

Keywords: *energy saving, energy efficiency, energy saving, reliable activity, energy consumption, renewable energy sources.*

2010 Йил охирида ноанъанавий енергия ишлаб чиқариш бўйича етакчи мамлакатлар Исландия (енергия балансидаги Реснинг тахминан 25%, асосий РЕС геотермал енергия), Дания (енергия балансидаги Реснинг тахминан 20,6%, асосий РЕС шамол енергияси), Португалия (18% енергия балансидаги РЕС, асосий РЕС-тўлқин енергияси, қуёш енергияси ва шамол), Испания (енергия балансидаги Реснинг 17,7%, асосий РЕС-қуёш енергияси) ва янги Зеландия (енергия балансидаги Реснинг 15,1%, асосий РЕС-геотермик ва шамол енергияси). Бундан ташқари, Ватикан, Хитой ва Ҳиндистон 2010 йилда муқобил енергетикани ривожлантиришга фаол сармоя киритди.

Европа ва Ақшда муқобил ва қайта тикланадиган енергия соҳасидаги вазият бошқа сценарий бўйича ривожланди. 1973 йилдаги жаҳон нефт инқирози муқобил қайта тикланадиган енергия манбаларига қизиқишни кучайтирди. 1974 йил давомида нефт нархи тўрт баравар ошди ва Ғарб

мамлакатлари инқироз сабабларини тушуниб, муқобил енергия соҳасида тадқиқотларни бошладилар, уларнинг стратегик мақсади миллий енергия хавфсизлигини таъминлаш еди. Олимларнинг иши ҳар хил турдаги муқобил манбалар устида олиб борилди, ягона аниқ чекловчи омил маълум ҳудудларнинг табиий-иқлим шароити еди.

“Независимая Газета” томонидан келтирилган маълумотларга кўра, дунёда қайта тикланадиган енергия манбаларининг (шу жумладан кичик гидроенергетиканинг) улуши 30 йил ичида кўп ўсмаган: 13,3 йилда 1970% дан 13,6 йилда 2000% гача. Муқобил қайта тикланадиган енергия манбаларига инвестициялар фақат 2000-йилларнинг ўрталарида кўп марта ошди: 33,4 йилда 2004 миллиард доллардан 148,4 йилда 2007 миллиард долларгача. 2007 йилдан бери Google шамол ва қуёш енергиясига фаол сармоя киритмоқда. 2007 йилда муқобил енергия соҳасидаги хорижий лойиҳаларнинг рентабеллиги ўртача 10-20% га баҳоланди, аммо яқин келажакда сезиларли ўсиш потенциалига ега. 2009 йилда техника фанлари доктори Олег Попелнинг сўзларига кўра, global енергия балансида муқобил РЕС улуши 5%, шамол енергиясининг ўсиш суръати йилига 30%, қуёш енергияси еса йилига 50% ни ташкил етди.

2010 йилда Ватиканда Европадаги енг йирик қуёш електр станциясининг қурилиши якунланди, бу бошқа енергия манбаларидан фойдаланишни деярли бутунлай тарк етишга имкон беради. Ҳиндистоннинг режаларига қуёш енергиясини кенг миқёсда ривожлантириш ҳам киритилган. 2011 йил охирига келиб Гужаратда 1000 Мвт қувватга ега қуёш електр станциясининг қурилиши якунланди. Хитой шамол енергиясини ривожлантириш лойиҳаларини фаол молиялаштиради. 2010 йилда Хитой ишлаб чиқарилган шамол енергияси бўйича дунёда Ақшдан кейин иккинчи ўринни егаллаб, Германияни ортда қолдирди.

ХХИ аср бошидан бери чет елда муқобил енергия инвестицияларнинг яна бир тўлқинини олди. Европа Иттифоқи АЕ ёрдамида умумевропа електр енергиясини тақсимлаш тизимини яратишни бошлади, Қўшма Штатлар енергия балансидаги муқобил енергия манбалари улушини 20 йилга келиб 2020% гача ошириш режаларини еълон қилди. Европа Иттифоқи, шунингдек, енергия балансидаги муқобил енергия манбаларининг улушини 20 йилга келиб 2020 фоизга ва 40 йилда 2040 фоизга оширишни режалаштирмоқда. Хусусан, Испанияда давлат иштирокида олтита йирик қуёш електр станцияларини қуриш режалаштирилган бўлиб, улар яратилаётган умумевропа електр енергиясини тақсимлаш тизими шароитида електр енергиясини бошқа минтақалар билан бўлишиш имкониятига ега бўлади. Дания ва Германия иштирокидаги шамол стансиялари учун ҳам худди шундай енергия ресурсларини қайта тақсимлаш режалаштирилган.

Маълумки, республикамизда иқтисодиёт барқарор ўсишини таъминлашга ва аҳолининг фаровонлик даражасини оширишга, ёқилғи-енергетика ресурсларига бўлган талаб – эҳтиёжни узлуксиз қаноатлантиришга қаратилган нефть – газ, електр енергетика, кўмир, кимё, қурилиш

индустриясини ривожлантиришнинг узоқ муддатли стратегияси амалга оширилмоқда. Шу билан бирга, ёқилғи – энергетика тармоғининг мавжуд қувватлари энергия ресурсларига ортиб бораётган талаб-эҳтиёжни тўлиқ даражада таъминламаяпти, мамлакатимиз иқтисодиётининг энергия сарфи ҳажми ривожланган мамлакатларнинг ўртача кўрсаткичидан анча юқоридир. Ҳозирги вақтда асосан гидроэлектростанциялар ишлаб чиқараётган қайта тикланувчи энергия манбалари ҳиссасига мамлакатда ишлаб чиқарилаётган электр энергияси умумий ҳажмининг атиги ўн фоизи тўғри келмоқда. Ниҳоятда катта салоҳият мавжуд бўлишига қарамасдан, қуёш ва шамол сингари қайта тикланувчи энергия манбаларининг имкониятларидан тўлиқ даражада фойдаланилмаяпти. Шу муносабат билан, иқтисодиёт тармоқлари ва ижтимоий соҳанинг энергия самарадорлигини ошириш, энергия тежовчи технологиялар ва қайта тикланувчи энергия манбаларини кенг жорий этиш давлат сиёсатининг ҳозирги босқичдаги долзарб йўналишларидан бири бўлиб қолиши лозим.

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ЭНЕРГЕТИКАДА САНОАТИДА БИОМАССАНИНГ ЎРНИ

Аннотация: *Энергетикада саноатида биомассанинг рўли ва ундан самарали фойдаланишини тадқиқ қилиш. Ушбу жараёнлар натижасида биогаз (метан ва карбонат ангидрид), органик кислоталар, спиртлар ва асетон олинади. Юқори намлик (чиқинди сув, маиший чиқиндилар, органик қолдиқларни гидролизлаш маҳсулотлари) бўлган биомасса биологик жараёнлар билан қайта ишланади: анаэроб ҳазм қилиш ва ферментация.*

Калит сўзлар: *Энергия тежаш, энергия самарадорлиги, энергетик тежамкорлик, ишончли фаолият, энергия сарфи, қайта тикланувчи энергия манбалари.*

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THE ROLE OF BIOMASS IN THE ENERGY INDUSTRY

Abstract: *The roll of biomass in the energy industry and from it effective use research. As a result of these processes, biogas (methane and carbon dioxide), organic acids, alcohols and acetone are obtained. Biomass with high humidity (waste water, household waste, organic residue hydrolysis products) is processed by biological processes: anaerobic digestion and fermentation.*

Keywords: *energy saving, energy efficiency, energy saving, reliable activity, energy consumption, renewable energy sources.*

Биомассадан энергиядан фойдаланишнинг енг истиқболли йўналишларидан бири ундан биогаз ишлаб чиқаришдир. Биогаз қурилмалари ва қурилмалари Россиянинг исталган минтақаларида куннинг исталган вақтида, органик чиқиндилар ва энергия биомассаси мавжуд бўлган деярли ҳамма жойда ишлаши мумкин.

Юқори намлик (чиқинди сув, маиший чиқиндилар, органик қолдиқларни гидролизлаш маҳсулотлари) бўлган биомасса биологик жараёнлар билан қайта ишланади: анаэроб ҳазм қилиш ва ферментация. Ушбу жараёнлар натижасида биогаз (метан ва карбонат ангидрид), органик кислоталар, спиртлар ва асетон олинади.

Намликка қараб, биомасса термокимёвий ёки биологик усуллар билан қайта ишланади. Намлиги паст бўлган биомасса (қишлоқ хўжалиги ва шаҳар қаттиқ чиқиндилари) термокимёвий жараёнлар билан қайта ишланади: тўғридан-тўғри ёниш, пиролиз (термал парчаланиш), суюлтириш, гидролиз.

Натижада сув буғлари, електр энергияси, ёқилғи гази, водород, суюқ ёқилғи, кўмир, глюкоза олинади.

Биоэнергия - бу "биомасса энергияси, биогаз ва биомассани қайта ишлаш маҳсулотларини бошқа энергия турларига айлантириш."

Биомасса ердаги қайта тикланадиган энергиянинг енг истиқболли манбаларидан биридир. Бу ҳақиқатга биомассанинг муҳим энергия салоҳияти ва бу энергия манбасининг нисбатан оддий янгиланиши каби ўзига хос хусусиятлари ёрдам беради. Бундан ташқари, ушбу турдаги ёқилғини ишлаб чиқариш ва улардан фойдаланиш катта молиявий инвестицияларни талаб қилмайди.

"Биомасса" атамаси ўсимлик ва ҳайвонот манбаларидан барча қайта ишланадиган органик моддаларни бирлаштиради. Биомасса бирламчи (ўсимликлар ,ҳайвонлар, микроорганизмлар ва бошқаларга бўлинади.) ва иккиламчи (бирламчи биомасса ва одамлар ва ҳайвонларнинг чиқиндиларини қайта ишлаш чиқиндилари). Биоёқилғининг уч тури мавжуд: суюқ (етанол, метанол, биодизел), қаттиқ (ўтин, сомон) ва газсимон (биогаз, водород).

Биомассадан энергия ишлаб чиқариш дунёнинг кўплаб мамлакатларида енг жадал ривожланаётган тармоқлардан биридир.

Гўнгдан биогазни енг самарали ишлаб чиқариш. Унинг бир тоннасидан 10-12 м3 метан олиш мумкин. Дала деҳқончилигидан 100 million тонна донли сомон каби чиқиндиларни қайта ишлаш 20 миллиардга яқин маблағни бериши мумкин. м3 метан. Пахта етиштириладиган ҳудудларда йилига 8-9 million тонна пахта пояси қолади, ундан 2 миллиардгача пахта олиш мумкин. м3 метан. Худди шу мақсадлар учун маданий ўсимликлар ва ўтларнинг тепаларини йўқ қилиш мумкин.

Россияда ҳар йили Халқ хўжалигининг турли соҳаларида 300 million тоннагача (қуруқ моддалар) ишлаб чиқарилади, шундан: қишлоқ хўжалигида 230 million тонна – чорвачилик ва паррандачиликда 130 million тонна ва ўсимликчиликда 100 million тонна; шаҳарларда – 70 million тонна: 60 million тонна қишлоқ хўжалиги ишлаб чиқаришида. қаттиқ маиший чиқиндилар ва 10 million тонна канализация лойи. Белгиланган миқдордаги чиқиндиларнинг энергия салоҳияти 190 million тонна кубни ташкил қилади.t., ҳақиқатан ҳам 45 million тоннагача су олиш мумкин. Биомассадан энергия олиш технологияларидан фойдаланиш учун энергия ишлаб чиқаришнинг хом ашё манбасига яқинлиги зарур ("ноанъанавий биомасса" учун бу қишлоқ хўжалиги корхоналари, фермер хўжаликлари), бу сизга нисбатан арзон энергиянинг мақбул миқдорини олиш имконини беради. Россияда чернозем вилояти, Krasnodar ўлкаси, Марказий Россия ва Жанубий Сибирда биомассадан энергия ишлаб чиқаришни ташкил етиш мақсадга мувофиқдир.

Геотермик энергия - бу " геотермик сувларнинг энергиясини бошқа энергия турларига айлантириш."Геотермал манбалар деярли битмас-туганмас ва олинган энергия миқдори бўйича юқори даражада башорат қилиш қобилиятига ега.

Халқаро енергетика агентлиги таснифига кўра геотермал энергия манбалари 5 турга бўлинади :

1. геотермик қуруқ буг ъ конлари;
2. нам буг ъ манбалари (иссиқ сув ва буг ъ аралашмалари);
3. геотермик сув конлари (иссиқ сув ёки буг ъ ва сувни ўз ичига олади);
4. magma билан иситиладиган қуруқ иссиқ тошлар;
5. magma, қайси ериган жинслар ҳисобланади.

Сув, буг ёки уларнинг аралашмасининг ҳароратига қараб, геотермик манбалар паст ҳароратли ва ўрта ҳароратга (130-150 гача) ва юқори ҳароратга (150 дан ортиқ) бўлинади. Геотермик манбанинг ҳарорати асосан уни ишлатиш хусусиятини белгилайди.

Геотермал энергиядан фойдаланиш бир қатор аниқ афзалликларга ега:

1. ушбу турдаги энергия захиралари деярли тугамайди;
2. геотермик энергия жуда кенг тарқалган;
3. геотермал энергиядан фойдаланиш катта харажатларни талаб қилмайди.

Бироқ, шу билан бирга, геотермал энергия иккита муҳим камчиликка ега:

1. унинг манбасида геотермал энергиянинг заиф концентрацияси;
2. буг заҳарли газларни ўз ичига олади ва сув олтингугурт ва бошқа аралашмаларни ташийди.

Россияда геотермал энергия потенциал фойдаланиш бўйича биринчи ўринда туради. Россияда ушбу турдаги энергиянинг умумий захиралари 2000 Мвт га баҳоланмоқда. Геотермал энергиянинг иқтисодий салоҳияти йилига 115 million тоннани ташкил этади.

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ҚАЙТА ТИКЛАНУВЧАН ЭНЕРГИЯ МАНБАЪЛАРИ ИСТИҚБОЛИ

Аннотация: *Сўнгги йилларда рўй берган, давлатлар ва минтақаларнинг энергия хавфсизлигига потенциал таъсир кўрсатадиган сиёсий, иқтисодий ва екологик инқирозлар муқобил енергетикани ривожлантириш учун қўшимча рағбат бўлиб хизмат қилди. Инсоният қайта тикланмайдиган энергия манбаларига ва уларнинг нархларига қабул қилиб бўлмайдиган даражада юқори даражада боғлиқлигини англаганидан кейин бошланди.*

Калит сўзлар: *Энергия тежаш, энергия самарадорлиги, энергетик тежамкорлик, ишончли фаолият, энергия сарфи, қайта тикланувчи энергия манбалари.*

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THE PROSPECT OF RENEWABLE ENERGY SOURCES

Abstract: *The political, economic and yekological crises that have occurred in recent years, potentially affecting the energy security of states and regions, have served as an additional incentive for the development of alternative yenergetics. It began after humanity realized that it was at an unacceptable high level of dependence on non-renewable energy sources and their prices.*

Keywords: *energy saving, energy efficiency, energy saving, reliable activity, energy consumption, renewable energy sources.*

Сўнгги йилларда рўй берган, давлатлар ва минтақаларнинг энергия хавфсизлигига потенциал таъсир кўрсатадиган сиёсий, иқтисодий ва екологик инқирозлар муқобил енергетикани ривожлантириш учун қўшимча рағбат бўлиб хизмат қилди. Бундай инқироз Ақш террористик ҳужумлар ўз ичига олади (2001), Москва електр ҳодиса (2005), Европа Иттифоқи мамлакатлари учун Украина орқали газ транзит узилишлар (2009), Япония Fukushima—1 атом стансиясида ҳодиса (2011), шунингдек бошқа шунга ўхшаш воқеалар сифатида. Бундай ҳодисалардан сўнг, инсоният қайта тикланмайдиган энергия манбаларига қабул қилиб бўлмайдиган даражада юқори даражада қарамлигини, шунингдек, уларнинг баъзиларининг хавфлилигини тобора кўпроқ англамоқда.

Қайта тикланадиган энергия манбалари — қуёш энергияси, шамол энергияси, сув энергияси (шу жумладан оқава сув энергияси), бундай

энергиядан гидроелектростанцияларда фойдаланиш бундан мустасно, сув ҳавзаларининг тўлқин энергияси, шу жумладан сув омборлари, дарёлар, денгизлар, океанлар, табиий ер ости иссиқлик ташувчиларидан фойдаланган ҳолда геотермик энергия, паст потенциал ернинг иссиқлик энергияси, ҳаво, махсус иссиқлик ташувчилар, биомассадан фойдаланган ҳолда сув, энергия ишлаб чиқариш учун махсус ўстирилган ўсимликлар, шу жумладан дарахтлар, шунингдек ишлаб чиқариш ва истеъмол чиқиндилари киради, углеводород хом ашёси ва ёқилғидан фойдаланиш пайтида олинган чиқиндилар бундан мустасно, биогаз, бундай чиқиндиларнинг чиқиндихоналарида ишлаб чиқариш ва истеъмол чиқиндилари натижасида чиқарилган газ, кўмир конларида ҳосил бўлган газ."

Қайта тикланадиган энергия манбаларини яна иккита гуруҳга бўлиш мумкин — анъанавий ва ноанъанавий (муқобил) энергия манбалари. Гидроенергетика ва ёғоч чиқиндиларини ёқилғи сифатида ишлатадиган биоэнергия бўлими анъанавий энергия манбалари ҳисобланади. Муқобил энергия манбаларига қуйидагилар киради: геотермик, қуёш, шамол ва тўлқин энергияси, шунингдек кичик гидроенергетика ва биомасса энергиясининг анъанавий энергия манбаларига тегишли бўлмаган қисми.

Муқобил манбалардан фойдаланиш бўйича ишланмалар илгари амалга оширилган бўлса-да, global миқёсда муқобил энергиянинг фаол ривожланиши 1973 йилги нефт инқирозидан сўнг, инсоният қайта тикланмайдиган энергия манбаларига ва уларнинг нархларига қабул қилиб бўлмайдиган даражада юқори даражада боғлиқлигини англаганидан кейин бошланди. Нефт ва газ қабулхонасининг фаол қаршиликларига қарамай, замонавий дунёда муқобил энергия манбаларидан фойдаланиш ҳам иқтисодий, ҳам энергия самарадорлиги нуқтаи назаридан истиқболли ҳисобланади.

Федерацияси Россия муқобил энергия соҳасида катта имкониятларга ега. Мамлакатимизнинг деярли ҳар бир минтақасида қайта тикланадиган энергия манбаларидан (РЕС) фойдаланиш имконияти мавжуд. Ва бу йўналишдаги баъзи тадқиқотлар ва ишланмалар 1950-1960 йилларда фаол олиб борилган бўлса-да, Россияда муқобил енергетиканинг фаол ривожланиши фақат 2000-йилларда бошланган.

Айни пайтда Россия қайта тикланадиган ва муқобил энергия манбаларининг деярли барча маълум турларидан фойдаланган ҳолда електр станцияларини яратиш бўйича муваффақиятли тажрибага ега. Асосий муаммо 2000-йилларнинг охирида бир қатор fundamental қарорлар қабул қилинганига қарамай, муқобил энергияни Реал давлат томонидан қўллаб-қувватлашнинг йўқлиги.

Ушбу қонун замонавий шароитларда электр энергетика тармоғида рақобат муҳитини ривожлантириш ва инвестицияларни жалб қилиш электр энергиясини ишлаб чиқариш ва етказиб бериш соҳасидаги фаолиятнинг институционал ва ташкилий-ҳуқуқий асосларини тубдан такомиллаштириш, электр энергетика тармоғини ислоҳ қилиш бўйича вазифаларнинг амалий ижросини таъминлаш, шунингдек, 2017 — 2021 йилларда Ўзбекистон

Республикасини ривожлантиришнинг бешта устувор йўналиши бўйича Ҳаракатлар стратегияси ва Ўзбекистон Республикаси Маъмурий ислоҳотлар концепциясида белгиланган вазифаларни бажариш мақсадларини белгилайди.

Маълумки, республикамизда иқтисодиёт барқарор ўсишини таъминлашга ва аҳолининг фаровонлик даражасини оширишга, ёқилғи-энергетика ресурсларига бўлган талаб – эҳтиёжни узлуксиз қаноатлантиришга қаратилган нефть – газ, электр энергетика, кўмир, кимё, қурилиш индустриясини ривожлантиришнинг узоқ муддатли стратегияси амалга оширилмоқда. Шу билан бирга, ёқилғи – энергетика тармоғининг мавжуд қувватлари энергия ресурсларига ортиб бораётган талаб-эҳтиёжни тўлиқ даражада таъминламаяпти, мамлакатимиз иқтисодиётининг энергия сарфи ҳажми ривожланган мамлакатларнинг ўртача кўрсаткичидан анча юқоридир. Ҳозирги вақтда асосан гидроэлектростанциялар ишлаб чиқараётган қайта тикланувчи энергия манбалари ҳиссасига мамлакатда ишлаб чиқарилаётган электр энергияси умумий ҳажмининг атиги ўн фоизи тўғри келмоқда. Ниҳоятда катта салоҳият мавжуд бўлишига қарамасдан, қуёш ва шамол сингари қайта тикланувчи энергия манбаларининг имкониятларидан тўлиқ даражада фойдаланилмаяпти. Шу муносабат билан, иқтисодиёт тармоқлари ва ижтимоий соҳанинг энергия самарадорлигини ошириш, энергия тежовчи технологиялар ва қайта тикланувчи энергия манбаларини кенг жорий этиш давлат сиёсатининг ҳозирги босқичдаги долзарб йўналишларидан бири бўлиб қолиши лозим.

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ЭЛЕКТР ЭНЕРГИЯСИДАН ОҚИЛОНА ФОЙДАЛАНИШ ДОЛЗАРБЛИГИ

Аннотация: *“Электр энергетика тармоғини янада ривожлантириш ва ислоҳ қилиш стратегияси тўғрисида”, “Электр энергетикаси тўғрисида”, “Электр ва иссиқлик энергиясидан фойдаланиш қоидаларини тасдиқлаш тўғрисида”, “Қайта тикланувчи энергия манбаларидан фойдаланиш тўғрисида” ва бир нечта қонунлар қабул қилинди.*

Калит сўзлар: *Энергия тежаш, энергия самарадорлиги, энергетик тежамкорлик, ишончли фаолият, энергия сарфи, қайта тикланувчи энергия манбалари.*

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RELEVANCE OF RATIONAL USE OF ELECTRICITY

Abstract: *On the strategy for the further development and reform of the electric power sector, on electricity, on approval of the rules for the use, of electricity and thermal energy, on the use of renewable energy and several laws were adopted.*

Keywords: *energy saving, energy efficiency, energy saving, reliable activity, energy consumption, renewable energy sources.*

Ўзбекистон Республикаси Олий Мажлиси томонидан 2019 йил 27 мартда қабул қилинган “Ўзбекистон Республикасида электр энергетика тармоғини янада ривожлантириш ва ислоҳ қилиш стратегияси тўғрисида” қонун Электр энергетика тармоғининг ишончли фаолият юритишини таъминламасдан туриб иқтисодиёт тармоқлари ва мамлакат ҳудудларининг саноат салоҳиятини ошириш, тадбиркорлик фаолиятини ривожлантиришни рағбатлантириш, аҳоли фаровонлигини юксалтириш ва ҳаёт сифатини яхшилаш масалаларига бағишланган.

Ўзбекистон Республикаси Олий Мажлиси томонидан 2009 йил 30 сентябрда қабул қилинган “Электр энергетикаси тўғрисида”ги қонуннинг қабул қилиниши электр энергетикаси соҳасидаги муносабатларни тартибга солиш, Ўзбекистон Республикасининг электр энергетика хавфсизлигини таъминлаш, лектр энергиясини ҳосил қилиш, узатиш ва сотиш бўйича бошқарув ҳамда хўжалик алоқалари тизимига бозор принциплари ва механизмларини жорий этиш, электр энергетикасининг мутаносиб

ривожланишини таъминлаш, электр энергиясидан ва ёқилғи-энергетика ресурсларидан оқилона фойдаланишга имкониятини беради.

Сўнгги йилларда мамлакатимизда, аввало, иқтисодиётнинг барча тармоқларини ривожлантиришни жадаллаштириш, инвестицион жозибадорлик ва ишбилармонлик фаоллигини ошириш, ишлаб чиқариш ва хизмат кўрсатиш соҳасини кенгайтириш борасида кенг кўламли ислоҳотлар амалга ошириш ҳамда Ўзбекистон республикасида энергетикани ривожлантириш ва ундан оқилона фойдаланиш бўйича "Энергиядан оқилона фойдаланиш тўғрисида", "Электр энергетика тармоғини янада ривожлантириш ва ислоҳ қилиш стратегияси тўғрисида", "Электр энергетикаси тўғрисида", "Электр ва иссиқлик энергиясидан фойдаланиш қоидаларини тасдиқлаш тўғрисида", "Қайта тикланувчи энергия манбаларидан фойдаланиш тўғрисида" ва бир нечта қонунлар қабул қилинди.

Юқорида санаб ўтилган қонунлар ичида 1997 йил 25 апрелда қабул қилинган "Энергиядан оқилона фойдаланиш тўғрисида" ги қонун энергия ҳосил қиладиган ва энергия сарфлайдиган асбоб-ускуналар ҳамда маҳсулотга қонунчиликда назарда тутилган тартибда энергия жиҳатидан самарадорлик кўрсаткичларидан фойдаланиш ҳақидаги қонунлардан бири ҳисобланади.

Ушбу қонуннинг мақсади миллий энергетика ресурслари сақланишини, энергиядан ва ишлаб чиқариш имкониятларидан самарали фойдаланишни таъминлайдиган умумий ҳуқуқий асосларни шакллантиришдан иборатдир.

Албатта, Ўзбекистон Республикасининг 1997 йил 25 апрелда қабул қилинган «Энергиядан оқилона фойдаланиш тўғрисида»ги 412-I-сонли Қонунига киритилган ўзгартиришлар Қонунчилик палатаси томонидан 2020 йил 1 майда қабул қилинган бўлиб, Сенат томонидан 2020 йил 19 июнда маъқулланган. Ўзбекистон Республикасининг Президенти Ш. Мирзиёев 2020 йил 14 июль санасида ушбу ўзгартиш ва қўшимчаларниЎРҚ-628-сон билан имзолади, Қонун расман эълон қилинди ва эълон қилинган кундан эътиборан кучга кирди. Хулоса ўрнида шуни алоҳида таъкидлаш жоизки, Ўзбекистон Республикаси Қонунига ўзгартиш ва қўшимчалар киритилганда: «энергиядан оқилона фойдаланиш», «энергияни тежаш ва энергия жиҳатидан самарадорликни ошириш», «давлат томонидан қўллаб-қувватлашни», «энергия жиҳатидан самарадор», «энергия тежаладиган дастурлар ва лойиҳаларни ишлаб чиқиш», «энергия жиҳатидан тежамкор техника ҳамда маҳсулот» «қайта тикланувчи энергия манбалари» каби муҳим жумлалар учрайдики, буларнинг барчаси Қонун энергетика соҳасининг ривожи, истеъмолчиларнинг ҳақ-ҳуқуқлари, Ўзбекистоннинг табиий бойликларидан оқилона фойдаланиш — энергия тежамкорлиги ва самарадорлиги нуқтаи назаридан бирмунча такомиллаштирилган.

Ушбу мақсадда Энергетика вазирлиги томонидан «Энергияни тежаш ва энергия самарадорлигини ошириш тўғрисидаги» қонун лойиҳаси ишлаб чиқилди ва норматив-ҳуқуқий ҳужжатлар лойиҳаларининг муҳокамаси порталида эълон қилинди. Лойиҳа 7 боб ва 24 моддадан иборат. У энергия

тежаш ва энергия самарадорлиги объект ва субъектларига тавсиф берувчи, асосий атама ва тушунчаларни белгиловчи ҳамда энергетика нуқтаи назаридан муносабатларни расмийлаштирувчи янги бўлим ва моддаларни ўз ичига олган. Бундай қонун лойиҳада келтирилган моддалар албатта энергияни тежаш ва самарадорлигини ошириш учун мақсад қилинган.

Ушбу қонун замонавий шароитларда электр энергетика тармоғида рақобат муҳитини ривожлантириш ва инвестицияларни жалб қилиш электр энергиясини ишлаб чиқариш ва етказиб бериш соҳасидаги фаолиятнинг институционал ва ташкилий-ҳуқуқий асосларини тубдан такомиллаштириш, электр энергетика тармоғини ислоҳ қилиш бўйича вазифаларнинг амалий ижросини таъминлаш, шунингдек, 2017 — 2021 йилларда Ўзбекистон Республикасини ривожлантиришнинг бешта устувор йўналиши бўйича Ҳаракатлар стратегияси ва Ўзбекистон Республикаси Маъмурий ислоҳотлар концепциясида белгиланган вазифаларни бажариш мақсадларини белгилайди.

Маълумки, республикамизда иқтисодиёт барқарор ўсишини таъминлашга ва аҳолининг фаровонлик даражасини оширишга, ёқилғи-энергетика ресурсларига бўлган талаб – эҳтиёжни узлуксиз қаноатлантиришга қаратилган нефть – газ, электр энергетика, кўмир, кимё, қурилиш индустриясини ривожлантиришнинг узоқ муддатли стратегияси амалга оширилмоқда. Шу билан бирга, ёқилғи – энергетика тармоғининг мавжуд қувватлари энергия ресурсларига ортиб бораётган талаб-эҳтиёжни тўлиқ даражада таъминламаяпти, мамлакатимиз иқтисодиётининг энергия сарфи ҳажми ривожланган мамлакатларнинг ўртача кўрсаткичидан анча юқоридир. Ҳозирги вақтда асосан гидроэлектростанциялар ишлаб чиқараётган қайта тикланувчи энергия манбалари ҳиссасига мамлакатда ишлаб чиқарилаётган электр энергияси умумий ҳажмининг атиги ўн фоизи тўғри келмоқда. Ниҳоятда катта салоҳият мавжуд бўлишига қарамасдан, қуёш ва шамол сингари қайта тикланувчи энергия манбаларининг имкониятларидан тўлиқ даражада фойдаланилмаяпти. Шу муносабат билан, иқтисодиёт тармоқлари ва ижтимоий соҳанинг энергия самарадорлигини ошириш, энергия тежовчи технологиялар ва қайта тикланувчи энергия манбаларини кенг жорий этиш давлат сиёсатининг ҳозирги босқичдаги долзарб йўналишларидан бири бўлиб қолиши лозим.

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МЕТОДИКА АНАЛИЗА ГЕОГРАФИЧЕСКИХ ЗАДАЧ И УПРАЖНЕНИЙ НА ОСНОВЕ СТАТИСТИЧЕСКИХ ДАННЫХ

Аннотация: *В данной статье на основе международного и отечественного опыта проанализированы теоретико-методические основы использования статистических данных в географическом образовании, их значение при выполнении задач и упражнений. В статье подробно рассматриваются статистические подходы, адаптированные для системы образования Узбекистана, их роль в развитии интерактивности, аналитических навыков и пространственного мышления. Доказано, что методика, основанная на статистическом анализе, служит для гармонизации географических знаний с жизненной реальностью.*

Ключевые слова: *статистический анализ, географическая задача, методика упражнений, интерактивное обучение, экономическая география, статистика Узбекистана, пространственное мышление, цифровые ресурсы.*

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METHODOLOGY OF ANALYSIS OF GEOGRAPHICAL TASKS AND EXERCISES BASED ON STATISTICAL DATA

Abstract: *Based on international and domestic experience, this article analyzes the theoretical and methodological foundations of using statistical data in geographical education, their importance in completing tasks and exercises. The article examines in detail statistical approaches adapted to the education system of Uzbekistan, their role in the development of interactivity, analytical skills and spatial thinking. It is proven that the methodology based on statistical analysis serves to harmonize geographical knowledge with life reality.*

Keywords*: statistical analysis, geographical task, exercise methodology, interactive learning, economic geography, statistics of Uzbekistan, spatial thinking, digital resources.*

Введение

Развитие географии на современном этапе напрямую связано с глобальными процессами, экономическими реформами и быстрым проникновением информационных технологий. В частности, подходы, основанные на статистических данных в социально-экономической географии, расширяют как теоретические, так и практические возможности географии как науки. С помощью этих методов можно анализировать реальные территориальные процессы, выявлять их взаимосвязь с современными экономическими и социальными факторами.

Использование статистических данных в географическом образовании формирует у учащихся и студентов такие навыки, как пространственное мышление, логический анализ, прогнозирование. Это позволяет сделать науку интерактивной, современной и практически актуальной. Соответственно, "географические задачи и упражнения"

Следует отметить, что концепция "новый узбекистан - новое образование," выдвинутая президентом республики узбекистан, ставит приоритетной задачей широкое внедрение в образование знаний, основанных на цифровой и реальной статистике. В стратегии развития на 2022-2026 годы определены задачи, связанные с эффективным использованием открытых данных и их применением в образовательных процессах.

Анализ литературы

Методика статистического анализа является глобально значимым направлением в области науки и образования. В таких странах, как сша, великобритания, германия, япония, эти методы сформировались как неотъемлемый компонент обучения. Например, в работе paul cloke et al. (2014) "introducing human geographies" широко освещена методика анализа элементов географии человека с помощью статистических показателей. Рекомендации по обучению региональным различиям, социальным индикаторам, экономической деятельности и экологическим факторам на основе интегрированной статистической модели

Другим важным аспектом является то, что открытые статистические данные, публикуемые государственным комитетом по статистике, проон, фао и всемирным банком, предоставляют уникальные источники для развития статистического мышления в географическом образовании. На основе таких данных можно глубоко проанализировать сложные географические вопросы, такие как территориальная специализация, демографические изменения, урбанизация, экологические показатели.

Основная часть: анализ географических задач и упражнений на основе статистических данных

1. Статистический характер географических задач

Географические вопросы часто направлены на объяснение пространственных, экономических и социальных различий. Например, такие задачи, как "определите плотность населения в регионах узбекистана," "определите региональную структуру промышленного производства" или

"рассчитайте темпы роста уровня урбанизации," решаются на основе статистических данных. Здесь целью является не только расчет, но и изучение взаимосвязи между статистическими показателями.

2. Методические подходы

Выполнение географических задач и упражнений на основе статистических данных состоит из следующих этапов:

Выбор источника статистической информации (например, stat.uz, data.gov.uz, world bank open data);

Отбор индикаторов (население, валовой внутренний продукт, миграция, промышленное производство, сектор услуг);

Визуализация на основе статистической таблицы, графика, диаграммы или карты;

Выявление соответствия, расхождений или тенденций между статистическими показателями;

Аналитические выводы и научные прогнозы.

3. Практические примеры

Определение уровня урбанизации в регионах узбекистана: расчет соотношения областных центров к населению на основе данных государственного комитета по статистике за 2023 год.

Связь между уровнем безработицы и экономической активностью: проводится межрегиональный сравнительный анализ с использованием данных проон и всемирного банка.

Плотность населения и инфраструктура здравоохранения: определите, в каком регионе высокая плотность населения, но нехватка медицинских услуг.

Таблица 1. Уровень урбанизации в регионах Узбекистана (по состоянию на 2023 год)

No Название области Общая численность населения (тыс. человек) Население города (тыс. человек) Уровень урбанизации (%)

№	Название региона	Название региона	Городское население (тыс.)	Уровень урбанизации (%)
1	г. Ташкент	2 900	2 900	100,0
2	Ташкентская область	3 130	1 700	54,3
3	Андижанская область	3 200	1 500	46,9
4	Ферганская область	3 900	1 600	41,0
5	Наманганская область	3 000	1 200	40,0
6	Самаркандская область	4 100	1 300	31,7
7	Бухарская область	2 100	900	42,9
8	Навоийская область	1 000	650	65,0
9	Кашкадарьинская область	3 300	900	27,3
10	Сурхандарьинская область	2 700	700	25,9

№	Название региона	Название региона	Городское население (тыс.)	Уровень урбанизации (%)
11	Джизакская область	1 400	600	42,9
12	Сырдарьинская область	900	500	55,6
13	Хорезмская область	2 000	800	40,0
14	Республика Каракалпакстан	2 000	900	45,0

Методика использования таблицы:

Сравнение: Самая высокая доля городского населения (г. Ташкент) и самая низкая (Сурхандарьинская) области.

Анализ: Обсуждается взаимосвязь уровня урбанизации с экономическим развитием, миграцией или инфраструктурой.

Работа с графиками: Создание диаграммы или графика на основе таблицы (например, с помощью Power BI или Excel).

Создать вопрос: Например: "В каких регионах уровень урбанизации выше 50%?"

Выполнение географических задач и упражнений на основе статистических данных служит развитию у учащихся и студентов не только новых знаний, но и таких жизненных компетенций, как сложное мышление, решение проблемных ситуаций, принятие решений. Это позволяет сформировать географию как технологически обоснованную науку посредством интеграции STEM (Science, Technology, Engineering, Mathematics) в современном образовании.

В настоящее время в системе преподавания географии Узбекистана количество упражнений, основанных на статистических методах, ограничено. В образовательных учреждениях недостаточно квалифицированных кадров, современных методических пособий и электронных средств для обучения статистическому анализу. В качестве решения:

Создание банка электронных задач;

Обучение преподавателей специальным программам статистической визуализации (MS Excel, Power BI, QGIS);

Предлагается разработка новых учебников и учебных пособий на основе статистической методики.

Вывод

Исполнение географических задач с помощью методов статистического анализа гармонизировано с современными образовательными требованиями и национальными стратегическими направлениями.

Через открытую статистическую базу данных Узбекистана имеется возможность глубокого анализа территориальных, социальных и экономических процессов.

Статистический подход в географическом образовании формирует у учащихся самостоятельное мышление, определение проблемы, цифровое мышление и аналитический подход.

Статистическое решение географических задач.

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УСЛОВИЯ ЭКСПЛУАТАЦИИ И ПАРАМЕТРЫ ТРАНСФОРМАТОРОВ

Аннотация: *Трансформаторы должны работать в различных режимах, возникающих в электрической цепи, а именно в установившихся и переходных режимах.*

Ключевые слова: *транспортировать, энергетический транспорт*

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OPERATING CONDITIONS AND PARAMETERS OF TRANSFORMERS

Abstract: *Transformers must operate in different modes that occur in an electrical circuit, namely steady-state and transient modes.*

Keywords: *Current transformers, power transformers*

Установившимся называют режим работы ТТ, при котором токи в первичной и вторичной обмотках ТТ не содержат затухающих свободных апериодических и периодических составляющих. Одним из видов установившегося режима является нормальный режим работы ТТ, при котором первичный и вторичный токи, погрешности различных видов и напряжения между обмотками ТТ не превышают длительно допустимых ■ при заданных условиях эксплуатации. К установившимся режимам относится также трансформация тока к. з. или другого тока, отличающегося от нормального рабочего тока установки, после затухания свободных составляющих.[1]

Переходным режимом работы ТТ называют электромагнитный процесс, возникающий при переходе от одного режима к другому вследствие резкого изменения параметров первичного тока или нагрузки ТТ (например, при к. з. или коммутациях в первичной цепи либо при внезапном замыкании накоротко ветви вторичного тока). При переходном режиме по первичной и вторичной обмоткам ТТ проходят свободные затухающие составляющие токов.

При правильном выборе ТТ токи в его обмотках ни при установившихся, ни при переходных режимах не должны превышать допустимые по термической и динамической стойкости. При этом погрешности различных видов также не должны быть больше допустимых в этих режимах погрешностей.[2]

Условия работы ТТ, предназначенного для измерений, существенно отличаются от условий работы ТТ, используемого для защиты. Основным режимом работы ТТ для измерений является нормальный режим. В этом режиме ТТ должен обеспечить пропорциональное воспроизведение первичного тока с наименьшими погрешностями как модуля, так и фазы. Работа ТТ для измерений при нормальном режиме рассмотрена в гл.2.

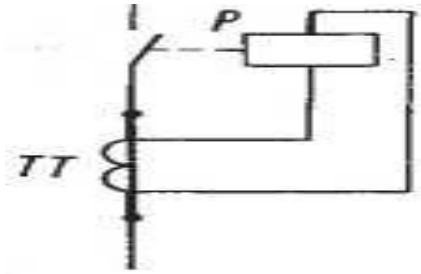

Рис. 1. Схема максимальной токовой защиты

В схемах максимальной токовой защиты (рис.1) ТТ должен обеспечить в цепи защиты полную мощность, необходимую для срабатывания реле *P* при перегрузках или токах короткого замыкания. Это требование сравнительно легкое, и его нетрудно выполнить.[3]

В схемах дифференциальной защиты (рис.2) к ТТ предъявляются значительно более сложные требования, а именно:

1)они должны обеспечивать безотказное срабатывание защиты при повреждении в зоне ее действия; для этого разность вторичных токов спаренных *TT1* и *TT2* должна превышать ток срабатывания реле *P* (левый рисунок);

2)они не должны вызывать ложных действий защиты при повреждении вне зоны ее действия (т. е. при сквозных токах); для этого токи небаланса спаренных *TT1* и *TT2* должны быть меньше тока срабатывания реле *P* (правый рисунок).

Дифференциальная защита выполняется таким образом, что перед защищаемым участком высоковольтной линии (или генератором, трансформатором) и после него включается по одному ТТ. Вторичные обмотки этих ТТ соединяются последовательно и согласно (т. е. начало вторичной обмотки *TT1* соединено с концом вторичной обмотки *TT2).* Реле *P* присоединено параллельно обеим вторичным обмоткам ТТ. Коэффициенты трансформации *TT1* и *TT2* подобраны таким образом, чтобы при нормальном режиме работы их вторичные токи были одинаковы. В этом случае при

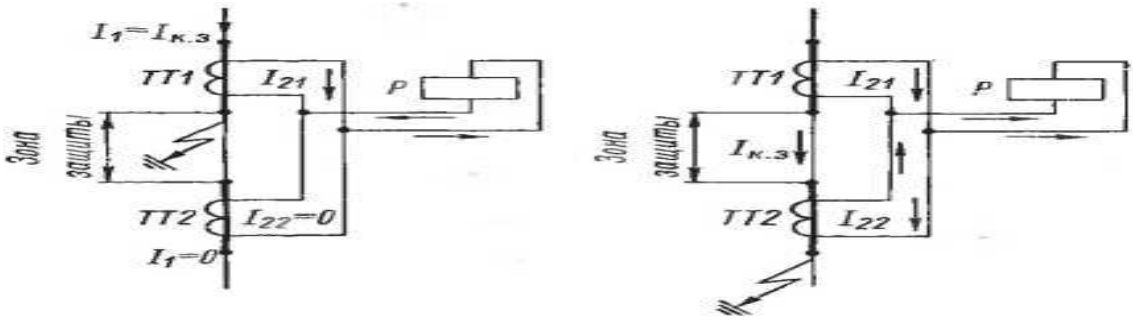

Рис. 1-6. Схемы дифференциальной защиты

нормальном режиме вторичный ток *TT1* I_{21} будет совпадать со вторичным током *TT2* I_{22} как по абсолютному значению, так и по фазе. Следовательно, через обмотку реле *P* уравнительный ток не пройдет. В момент короткого замыкания в зоне защиты при одностороннем питании участка вторичный ток I_{22} будет равен нулю, а при двустороннем питании будет складываться с током I_{21}

Для защиты линии или электрооборудования применяется несколько различных защит. В зависимости от назначения защищаемого объекта, числа и параметров примененных на нем видов защиты может потребоваться два, три и более защитных ТТ, а также ТТ для измерений. Изготавливать такое число отдельных ТТ экономически нецелесообразно. Поэтому высоковольтный трансформатор тока представляет собой изоляционную конструкцию, внутри которой размещены два-три трансформатора тока для релейной защиты и один для измерений. Каждый из этих ТТ имеет отдельный магнит провод со вторичной обмоткой. Первичная обмотка является общей для всех трансформаторов.[5]

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ПРОВЕРКА И ИСПЫТАНИЕ ТРАНСФОРМАТОРОВ

Аннотация: *В этой статье мы проанализировали заземление трансформаторов со значениями сопротивления менее 1 Ом. Мы также проверили их значения при испытании с помощью электрического устройства M416.*

Ключевые слова*: электроснабжение, энергосистемы, оптимальное управление, высокоскоростное движение, электроэнергетика, трансформаторы.*

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INSPECTION AND TESTING OF TRANSFORMERS

Abstract: *In this article, we analyzed the grounding of transformers with resistance values less than 1 ohm. We also examined their values when tested with the M416 electrical device.*

Keywords: *power supply, power systems, optimal control, high-speed traffic, electric power industry, transformers.*

Трансформаторы тока играют важную роль в контроле и защите электроэнергетических систем. КТ - это измерительные трансформаторы, используемые для преобразования первичного тока в пониженный вторичный ток для использования со счетчиками, реле, управляющим оборудованием и другими приборами.

Важность испытаний измерительных трансформаторов часто недооценивается. Трансформаторы тока для измерительных целей должны иметь высокую степень точности для обеспечения точного выставления счетов, в то время как те, которые используются для защиты, должны реагировать быстро и правильно в случае неисправности.

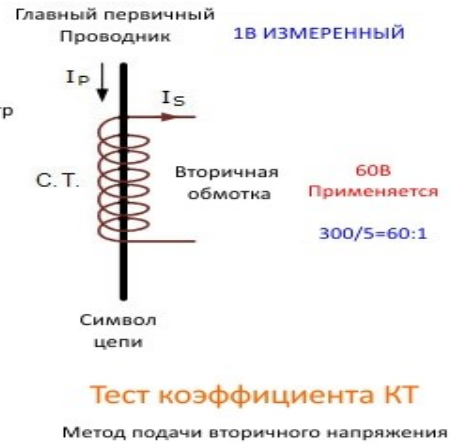
Такие риски, как путаница измерительных трансформаторов для измерения и защиты или смешивание соединений, могут быть значительно снижены путем тестирования перед первоначальным использованием. В то же время электрические изменения в КТ, вызванные, например, старением изоляции, могут быть выявлены на ранней стадии.

Существует разные методы электрических испытаний, которые должны быть выполнены на КТ, чтобы обеспечить точность и оптимальную надежность обслуживания:

Коэффициент КТ описывается как отношение входного первичного тока к выходному вторичному току при полной нагрузке. Например, КТ с соотношением 300:5 будет производить 5 ампер вторичного тока, когда 300 ампер протекают через первичную. Если первичный ток изменится, то соответственно изменится и вторичный ток на выходе. Например, если 150 ампер протекают через 300 амперную номинальную первичную обмотку, то выход вторичного тока составит 2,5 ампера.

(300:5 = 60:1) (150:300 = 2.5:5)

В отличие от трансформатора напряжения или силового трансформатора, трансформатор тока состоит только из одного или очень небольшого числа витков в качестве первичной обмотки. Эта первичная обмотка может состоять либо из одного плоского витка, либо из катушки сверхпрочного провода, обернутого вокруг сердечника, либо просто из проводника или шины, помещенной через центральное отверстие.



Тест коэффициента КТ может быть выполнен путем введения первичного тока и измерения выходного тока или путем введения вторичного напряжения и измерения индуцированного первичного напряжения.

Тест соотношения проводится для доказательства того, что соотношение КТ соответствует указанному для проверки правильности соотношения при различных отводах многоотводного КТ. Коэффициент поворота эквивалентен коэффициенту напряжения потенциальных трансформаторов и может быть выражен следующим образом:

N2 / N1=V2 / V1

- **N2** и **N1** - **число витков** вторичной и первичной обмоток.

- **V2** и **V1**-это показания вторичного и первичного бокового **напряжения**

Проверка соотношения выполняется путем подачи подходящего напряжения (ниже уровня насыщения) на вторичную обмотку тестируемого ТТ., в то время как напряжение на первичной стороне измеряется для вычисления отношения витков из выражения выше.

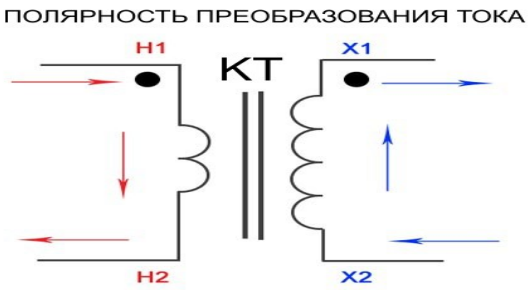
Самое важное соблюдать осторожность при проведении проверки коэффициента трансформации трансформатора тока, нельзя подавать высокое напряжение, которое может вызвать насыщение трансформатора.

Полярность трансформатора тока определяется направлением намотки катушек вокруг сердечника трансформатора (по часовой стрелке или против часовой стрелки) и тем, как выводы выводятся из корпуса трансформатора. Все трансформаторы тока имеют вычитающую полярность и должны иметь следующие обозначения для визуальной идентификации направления тока:

H1 - первичный ток, направление линии

H2 - первичный ток, направление нагрузки

X1 - вторичный ток



Знаки полярности на трансформаторе тока
обозначают относительные мгновенные направления токов.

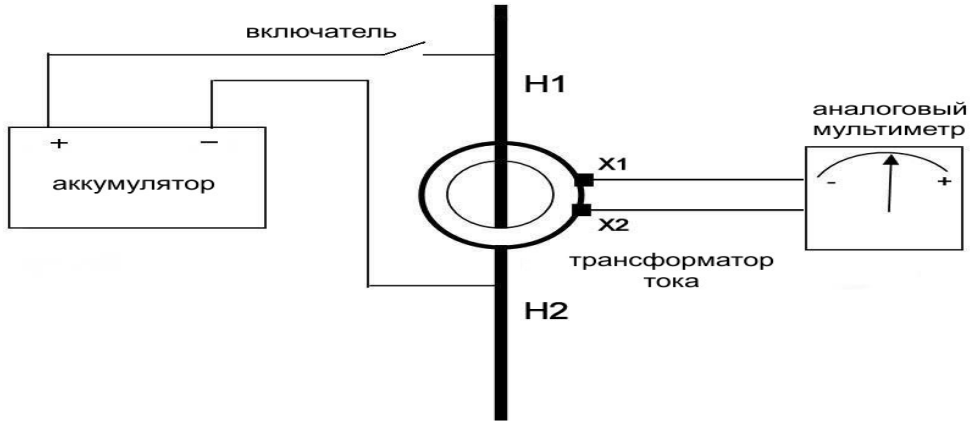
Предполагается, что испытуемый ТТ. имеет правильную полярность, если направления мгновенного тока для первичного и вторичного тока противоположны друг другу.

Знаки полярности на трансформаторе тока обозначают относительные мгновенные направления токов. Проверка полярности доказывает, что прогнозируемое направление вторичного тока ТТ. (уходящий) является правильным для данного направления первичного тока (входящего).

При установке и подключении трансформатора тока к реле измерения мощности и защитных реле важно соблюдать правильную полярность. В тот же момент, когда первичный ток поступает на первичный вывод, соответствующий вторичный ток должен покидать вторичный вывод, помеченный аналогичным образом.

Большинство современного испытательного оборудования СТ способно выполнять тест соотношения автоматически, используя упрощенную настройку измерительных проводов, и отображает полярность как правильную или неправильную. Полярность трансформатора тока

проверяется вручную с помощью батареи 9В и аналогового вольтметра со следующей процедурой проверки:



Маркировка трансформаторов тока иногда неправильно наносилась на заводе. Вы можете проверить полярность трансформатора тока в полевых условиях с помощью батареи 9 В.

Процедура проверки Полярности КТ

Вводите 25% первичного номинального тока от фазы к фазе со всеми подключенными нагрузками. Измерьте вторичный ток во всех точках цепей трансформатора тока. Это должно быть сделано для других этапов.

Пределы: Вторичный ток должен наблюдаться только на соответствующих фазовых и нейтральных проводниках во время инъекции фазы - Земли.

Вторичный ток не должен наблюдать ток в нейтральном проводнике только в соответствующих фазах и во время фазовой инъекции.

В зависимости от класса точности трансформаторы тока делятся на две группы: измерительные и защитные (релейные). КТ может иметь оценки нагрузки для обеих групп.

Измерительные КТ обычно определяются как 0.2 В 0.5

Последнее число указывает нагрузку в Омах. Для КТ с вторичным током 5 А номинальная нагрузка ВА может быть рассчитана следующим образом:

ВА = Напряжение * Ток = (Ток) 2 * Нагрузка = (5)2 * 0,5 = 12,5 ВА

Ретрансляционные КТ обычно задаются как 10С 400

Последнее число указывает максимальное значение. Вторичное напряжение в 20 раз превышает номинальный вторичный ток, не превышая погрешности отношения 10 %. Для КТ с вторичным током, рассчитанным на 5 А, 20-кратный номинальный ток вторичного тока даст нагрузку в 4 Ом.

Бремя = 400 / (20*5) = 4 ом

Нагрузка в ВА может быть определена следующим образом:

ВА = Напряжение * Ток = (Ток) 2 * Нагрузка = (5)2 * 4 = 100 ВА

При проверке, кроме определения нагрузки на вторичную обмотку трансформатора, необходимо знать значение расчётного первичного тока. Так

как с увеличением первичного тока погрешность трансформаторов возрастает, за расчётный принимается максимальный ток к.з. при повреждениях в тех точках сети, где увеличенная погрешность может привести к неправильному действию защиты.

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СВЯЗЬ МЕЖДУ РАЗНЫХ ФОРМ ПРЕДСТАВЛЕНИЯ МНОГОМЕРНЫХ СИНГУЛЯРНЫХ ИНТЕГРАЛОВ

Аннотация. *Многие задачи механики, теории аналитических функции математической физики и т.д. связаны с многомерными сингулярными интегральными уравнениями. Поэтому естественно интересен вопрос о том, какая существует связь между разными формами сингулярных интегралов и в статье изучается именно этот вопрос на примере* $\Phi(x)=\iint\limits_S \frac{M(x,y)}{r^2}\varphi(y)dy$, *где* $\varphi(x)$ *и* $\Phi(x)$ *- вектор функции, а* $M(x,y)$ *некоторая матрица, если* $x\in S$, *то данный интеграл является сингулярным интегралом.*

Ключевые слова: *вычислительная математика, квадратурная формула, кубатурная формула, сингулярный интеграл, интеграл с ядром Гильберта*

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THE RELATIONSHIP BETWEEN DIFFERENT FORMS OF REPRESENTATION OF MULTIDIMENSIONAL SINGULAR INTEGRALS

Abstract. *Many problems of mechanics, theory of analytical functions of mathematical physics, etc. are connected with multidimensional singular integral equations. Therefore, naturally the question of what connection exists between different forms of singular integrals is of interest and in the article this question is studied on the example of* $\Phi(x)=\iint\limits_S \frac{M(x,y)}{r^2}\varphi(y)dy$, *where* $\varphi(x)$ *and are the vector of the function, and* $M(x,y)$ *is some matrix, if* $x\in S$, *then this integral is a singular integral.*

Keywords: *computational mathematics, quadrature formula, cubature formula, singular integral, integral with Hilbert kernel.*

Ряд задач механики, теории аналитических функций, математической физики и других областей тесно связан с многомерными интегральными уравнениями [1]. Это обусловливает необходимость разработки приближённых методов для вычисления многомерных сингулярных интегралов. Вопрос о построении квадратурных и кубатурных формул как для обычных, так и для сингулярных интегралов является одним из наиболее актуальных направлений вычислительной математики. Он вызывает устойчивый научный интерес, о чём свидетельствует большое количество разнообразных работ в данной области.

Так, в работах В. В. Иванова [3, 4], Б. Г. Габдулхаева [2] и других, получили значительное развитие теория и практика сингулярных квадратур. В исследованиях [5–6, 8–10] рассматриваются различные подходы к построению квадратурных и кубатурных формул для интегралов с ядром Коши. Работа [7] посвящена построению приближённых формул для интегралов с ядром Гильберта. В связи с этим естественным представляется вопрос о существующих связях между различными формами сингулярных интегралов, в частности — между интегралами с ядрами типа Коши и Гильберта.

С этой целью в настоящей работе мы рассмотрим указанный вопрос на примере следующего интеграла:

$$Vf = \int_{-\infty}^{+\infty}\int_{-\infty}^{+\infty} \frac{\varphi(X,\theta)}{r^2} f(y_1, y_2)\, dy_1 dy_2, \tag{1}$$

где $\theta = \dfrac{Y - X}{\|Y _ X\|}$.

Если

$$\varphi(X,\theta) = b(X)\theta = \frac{Y - X}{\|Y - X\|} b(X),$$

то интеграл (1) примет вид:

$$Vf = b(X) \int_{-\infty}^{+\infty}\int_{-\infty}^{+\infty} \frac{Y - X}{\|Y - X\|} \frac{f(y_1, y_2)}{\|Y - X\|^2} dy_1 dy_2,$$

и

$$(Vf)_1 = b(x_1) \int_{-\infty}^{+\infty}\int_{-\infty}^{+\infty} \frac{y_1 - x_1}{\sqrt{(y_1 - x_1)^2 + (y_2 - x_2)^2}} \frac{f(y_1, y_2)}{r^2} dy_1 dy_2, \tag{2}$$

$$(Vf)_2 = b(x_2) \int_{-\infty}^{+\infty}\int_{-\infty}^{+\infty} \frac{y_2 - x_2}{\sqrt{(y_1 - x_1)^2 + (y_2 - x_2)^2}} \frac{f(y_1, y_2)}{r^2} dy_1 dy_2, \tag{3}$$

В последних интегралах проведем замену

$$y_1 = i\frac{1+t_1}{1-t_1},\ y_2 = i\frac{1+t_2}{1-t_2},\ x_1 = i\frac{1+\tau_1}{1-\tau_1},\ x_2 = i\frac{1+\tau_2}{1-\tau_2},$$

после чего имеем

$$(Vf)_1 = -4b\left(i\frac{1+\tau_1}{1-\tau_2}\right)\int_{\gamma_1}\int_{\gamma_2}\frac{\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}}{\sqrt{\left(\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}\right)^2+\left(\frac{1+t_2}{1-t_2}-\frac{1+\tau_2}{1-\tau_2}\right)^2}}\cdot$$

$$\cdot\frac{f\left(i\frac{1+t_1}{1-t_1},i\frac{1+t_2}{1-t_2}\right)}{\left[\left(\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}\right)^2+\left(\frac{1+t_2}{1-t_2}-\frac{1+\tau_2}{1-\tau_2}\right)^2\right]}\frac{dt_1dt_2}{(1-t_1)^2(1-t_2)^2},$$

или

$$(Vf)_1 = -4b\left(i\frac{1+\tau_1}{1-\tau_2}\right)\int_{\gamma_1}\int_{\gamma_2}\frac{\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}}{\sqrt{\left(\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}\right)^2+\left(\frac{1+t_2}{1-t_2}-\frac{1+\tau_2}{1-\tau_2}\right)^2}}\cdot$$

$$\cdot\frac{f\left(i\frac{1+t_1}{1-t_1},i\frac{1+t_2}{1-t_2}\right)(t_1-\tau_1)(t_2-\tau_2)}{\left[\left(\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}\right)^2+\left(\frac{1+t_2}{1-t_2}-\frac{1+\tau_2}{1-\tau_2}\right)^2\right](1-t_1)^2(1-t_2)^2}\frac{dt_1dt_2}{(t_1-\tau_1)(t_2-\tau_2)}, \quad (4)$$

где γ_1, γ_2 – единичные окружности.

Рассмотрим теперь величины

$$\frac{y_1-x_1}{\sqrt{(y_1-x_1)^2+(y_2-x_2)^2}}, \quad (5)$$

$$\frac{y_2-x_2}{\sqrt{(y_1-x_1)^2+(y_2-x_2)^2}} \quad (6)$$

из подынтегральных выражений (2) и (3). Они являются ограниченными величинами, то есть можно показать, что

$$\frac{|y_1-x_1|}{\sqrt{(y_1-x_1)^2+(y_2-x_2)^2}} \le 1,$$

$$\frac{|y_2-x_2|}{\sqrt{(y_1-x_1)^2+(y_2-x_2)^2}} \le 1.$$

Кроме того, если одним и тем же законом $y_1 \to x_1$ и $y_2 \to x_2$, то (5) и (6) стремятся к одному и тому же пределу $\frac{\sqrt{2}}{2}$. Аналогичные рассуждения имеют места и относительно следующих величин:

$$\frac{\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}}{\sqrt{\left(\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}\right)^2+\left(\frac{1+t_2}{1-t_2}-\frac{1+\tau_2}{1-\tau_2}\right)^2}}, \quad \frac{t_1-\tau_1}{\sqrt{\left(\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}\right)^2+\left(\frac{1+t_2}{1-t_2}-\frac{1+\tau_2}{1-\tau_2}\right)^2}}$$

и

$$\frac{t_2-\tau_2}{\sqrt{\left(\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}\right)^2+\left(\frac{1+t_2}{1-t_2}-\frac{1+\tau_2}{1-\tau_2}\right)^2}}.$$

Введя обозначения

$$b\left(t\frac{1+\tau_1}{1-\tau_1}\right)=b_1(\tau_1),$$

$$g_1(t_1,t_2,\tau_1,\tau_2)=\frac{4\left(\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}\right)(t_1-\tau_1)(t_2-\tau_2)f\left(i\frac{1+t_1}{1-t_1},i\frac{1+t_2}{1-t_2}\right)}{\left[\left(\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}\right)^2+\left(\frac{1+t_2}{1-t_2}-\frac{1+\tau_2}{1-\tau_2}\right)^2\right]^{3/2}(1-t_1)^2(1-t_2)^2},$$

из (4) имеем

$$(Vf)_1=b_1(\tau_1)\int_{\gamma_1}\int_{\gamma_2}\frac{g_1(t_1,t_2,\tau_1,\tau_2)dt_1dt_2}{(t_1-\tau_1)(t_2-\tau_2)}, \tag{7}$$

Аналогичным путем получаем, что

$$(Vf)_2=b_2(\tau_2)\int_{\gamma_1}\int_{\gamma_2}\frac{g_2(t_1,t_2,\tau_1,\tau_2)dt_1dt_2}{(t_1-\tau_1)(t_2-\tau_2)}, \tag{8}$$

где

$$b_2(\tau_2)=b\left(i\frac{1+\tau_2}{1-\tau_1}\right),$$

$$g_2(t_1,t_2,\tau_1,\tau_2)=\frac{4\left(\frac{1+t_2}{1-t_2}-\frac{1+\tau_2}{1-\tau_2}\right)(t_1-\tau_1)(t_2-\tau_2)f\left(i\frac{1+t_1}{1-t_1},i\frac{1+t_2}{1-t_2}\right)}{\left[\left(\frac{1+t_1}{1-t_1}-\frac{1+\tau_1}{1-\tau_1}\right)^2+\left(\frac{1+t_2}{1-t_2}-\frac{1+\tau_2}{1-\tau_2}\right)^2\right]^{3/2}(1-t_1)^2(1-t_2)^2}.$$

Таким образом, можно установить связь [1] между интегралами вида (7) и (8) и сингулярными интегралами с ядром Гильберта.

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ПЛОТНОСТЬ И ТЕРРИТОРИАЛЬНЫЙ СТРУКТУРА НАСЕЛЕНИЯ УЗБЕКИСТАНА

Аннотация: *В статье рассматриваются территориальные особенности размещения и плотности населения Республики Узбекистан. Регионы сгруппированы по размещению и плотности населения.*

Ключевые слова: *размещение населения, плотность населения, прирост населения, средняя численность населения, естественный прирост, миграционный прирост, городское население, сельское население.*

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DENSITY AND TERRITORIAL STRUCTURE OF POPULATION OF UZBEKISTAN

Abstract: *The article examines the territorial features of the distribution and population density of the Republic of Uzbekistan. Regions are grouped by distribution and population density.*

Key words: *population distribution, population density, population growth, average population size, natural increase, migration increase, urban population, rural population.*

Размещение населения и его плотность являются результатом длительного исторического процесса, связанного с экономическим освоением определенной территории. Степень экономического освоения проявляется в благоприятных или неблагоприятных условиях каждого региона для хозяйственной деятельности населения. Например, в последней четверти прошлого века в Мирзачульской пустыне, которая ранее считалась непригодной для хозяйственной деятельности и практически не имела населенных пунктов, и Каршинская степь, где население было крайне малонаселенным, были обводнены и освоены земли, в результате чего возникли ряд новых населенных пунктов.

Узбекистан является крупнейшим государством Центральной Азии по численности населения. Согласно статистическим данным, по состоянию на 1 января 2024 года его население достигло 36 799,8 тысяч человек. Этот показатель в 2000 году составлял 24 487,7 тысяч человек, увеличившись за прошедшие 24 года почти на 12 312,1 тысяч человек или на 150,3 процента. Средняя плотность населения в Узбекистане в 2000 году составляла 54,5 человек на 1 кв. км, а с ростом численности населения в регионе к 2024 году этот показатель достиг 82,0 человек.

Плотность населения резко различается по регионам. Это в основном зависит от их размера территории или численности населения. Например, в нашей стране разница между самой большой по площади Республикой Каракалпакстан (166,59 тыс. кв. км) и самой малой Сырдарьинской областью (4,28 тыс. кв. км), то есть относительный коэффициент равен 38,9. Стоит отметить, что на Андижанскую, Наманганскую, Сырдарьинскую, Ферганскую и Хорезмскую области с небольшой площадью приходится 6,4% территории страны и 36,5% населения (2024 г.).

Самой густонаселенной областью в Узбекистане является Андижанская область, где на 1 кв. км приходится 789,4 человека. Этот показатель в наименее заселенной Навоийской области составляет 9,7 человека, что в 81,4 раза меньше, чем в Андижанской области по плотности населения. Наличие

таких значительных различий требует разделения областей на группы по размещению и плотности населения, которые можно классифицировать следующим образом:

к первой группе относятся все области Ферганской долины с плотностью населения более 400 человек на 1 кв. км;

ко второй группе относятся Кашкадарьинская, Самаркандская, Сурхандарьинская, Сырдарьинская, Ташкентская и Хорезмская области с плотностью населения от 100 до 400 человек на 1 кв. км;

к третьей группе относятся Республика Каракалпакстан, Бухарская, Джизакская и Навоийская области с плотностью населения менее 100 человек на 1 кв. км.

В то время как на первую густонаселенную группу приходится 4,1 процента территории нашей страны и 28,6 процента населения, вторая группа составляет соответственно 20,2 и 45,1 процента, а третья группа - 75,5 и 18,0 процента.

Возникновение этих больших различий в плотности населения связано, во-первых, с численностью населения областей и размерами их территорий, а во-вторых, с естественным приростом населения и степенью освоения земель в хозяйственных целях, учитывая, что в речных оазисах издавна занимались орошаемым земледелием. Неслучайно почти половина населения страны проживает в сельской местности, и основная ее часть приходится на регионы с благоприятными природными условиями и развитым трудоемким земледелие

Поэтому густонаселенные районы считаются более освоенными и интенсивно используемыми в сельском хозяйстве. Кроме того, процесс внешней миграции в регионах в определенной степени повлиял на размещение населения.

Административно-территориальное устройство страны состоит из 12 областей, Республики Каракалпакстан и столицы - города Ташкента. В свою очередь, они состоят из 165 сельских районов. В республике насчитывается 120 городов, 1058 поселков и 10990 сельских населённых пунктов (СНП). Эти административно-территориальные единицы отличаются друг от друга по размеру, численности населения и выполняемым функциям. Например, на каждый из сельских районов приходится в среднем 204,6 тыс. человек, наибольший показатель в Самаркандской области - 300,6 тыс. человек и наименьший в Сырдарьинской области - 114,2 тыс. человек (2024 г.). Средняя численность населения сельских округов выше средней по стране только в Андижанской, Кашкадарьинской, Наманганской, Сурхандарьинской и Ферганской областях.

Средняя численность населения в нашей стране составляет 68,6 тыс. человек в городах и 6,9 тыс. человек в поселках городского типа (за исключением города Ташкента). Как было отмечено выше, сельские районы республики разделены на 10 990 сельских населенных пунктов, в каждом из которых средняя численность населения составляет 1,6 тыс. человек (2023 г.).

Регионы резко отличаются друг от друга по этим показателям. Например, самая высокая - 116,4 тыс. человек в городах Ферганской области и самая низкая - 37,5 тыс. человек в городах Сырдарьинской области. Кроме того, в городах Бухарской и Навоийской областей средняя численность населения составляет менее 50,0 тыс. человек. В городах других областей этот показатель составляет около 50,0-100,0 тыс. человек.

Результаты исследования показывают, что в Андижанской и Наманганской областях города относительно большие. Например, в городах этих областей средняя численность населения превышает 10 тысяч человек. В Бухарской и Навоийской областях посёлки небольшие, в них проживает в среднем менее 4 тысяч человек. Это ниже среднего показателя по стране в Республике Каракалпакстан, Кашкадарьинской, Сурхандарьинской, Ташкентской, Ферганской и Хорезмской областях.

Регионы также различаются по размеру сельских населенных пунктов. Если в нашей стране на сельские населенные пункты приходится в среднем 1,6 тыс. человек, то в Андижанской области - 3,5 тыс. человек. В Республике Каракалпакстан, Бухарской и Навоийской областях этот показатель составляет 0,9 тысячи человек. Из этого можно сделать вывод, что в пустынных районах деревни меньше, чем в других местах. Также в Самаркандской и Джизакской областях вышеуказанная ситуация ниже среднереспубликанского показателя.

Из результатов анализа можно сказать, что размер сельских районов, городов, поселков и сельских населенных пунктов в регионах зависит не только от численности населения, но и от количества административных единиц в них. Например, количество сельских районов в Республике Каракалпакстан составляет 16, в Ташкентской и Ферганской областях - 15, а в Навоийской и Сырдарьинской областях - по 8. Наибольшее количество городов - 16 в Ташкентской области и наименьшее - 3 в Хорезмской области. Также, если в Ферганской области насчитывается 194 городка, то в Сырдарьинской области этот показатель равен 25. В Самаркандской области насчитывается 1901 сельских населенных пункта, а в Сырдарьинской области - 257.

В Узбекистане насчитывается 111 сел с населением до 100 человек, в которых проживает 0,04 процента всего сельского населения. Этот показатель составляет 0,23 процента в Республике Каракалпакстан, 0,13 процента в Бухарской области и 0,17 процента в Навоийской области, в то время как в Андижанской, Наманганской, Сырдарьинской и Хорезмской областях нет сел такого масштаба. В свою очередь, малых сел в Республике Каракалпакстан 36, в Бухарской области 25, в Навоийской области 14, в Джизакской области 13 и в Самаркандской области 11.

В стране насчитывается 1917 малых сельских населенных пунктов с населением 101-500 человек (17,4%). В них проживает 611,9 тыс. человек (3,5%). Число сел с населением от 501 до 1000 человек составляет 2785 (25,3%), а их население - 2048,7 тыс. человек (11,6%). Это означает, что 84,9%

всего сельского населения проживает в деревнях с численностью населения более 1000 человек. Из этого можно сделать вывод, что развитие социальной инфраструктуры в малых селах региона, где проживает 15,1% сельского населения, является сложной задачей.

Распределение населения в сельской местности республики имеет территориальные различия, более 95 процентов сельского населения Андижанской, Наманганской и Хорезмской областей приходится на села с численностью населения более 1000 человек. Этот показатель составляет почти 90 процентов в Кашкадарьинской, Сырдарьинской, Ташкентской и Ферганской областях, 67,3 процента в Республике Каракалпакстан, 56,1 процента в Бухарской области и 63,3 процента в Навоийской области. 3,5 процента сельского населения нашей страны проживает в малых селах с численностью населения до 500 человек. Этот показатель составляет 14,4% в Республике Каракалпакстан, 11,2% в Бухарской области и 9,2% в Навоийской области, 0,3% в Андижанской области и 0,8% в Хорезмской области. В Наманганской области нет сел такого масштаба.

Основная часть населения нашей страны довольно плотно сосредоточена в районах с благоприятными природно-географическими условиями, а именно в долинах и оазисах, расположенных вблизи источников воды. Издревле население занималось трудоемким земледелием. По этой причине Ферганская, Чирчик-Ахангаранская и Зеравшанская долины, а также Хорезмский оазис густонаселены. Плато Устюрт, Кызылкум и другие пустынные территории, занимающие обширные площади, практически не заселены. Лишь в отдельных частях этих регионов встречаются транспортные или ресурсные городки и поселки, а также стоянки сезонных скотоводов.

Таким образом, плотность населения в административных единицах нашей страны зависит не только от численности населения и размера территории, но и от степени хозяйственного освоения территории. Как известно, на протяжении многих лет в экономике Узбекистана ведущее место занимала агроэкономика, то есть сельское хозяйство. Кроме того, основная часть населения проживала в сельской местности. Поэтому освоение территории, в свою очередь, зависит от доли земель, используемых в сельском хозяйстве региона, в частности орошаемых и пахотных земель.

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СОВРЕМЕННЫЕ ЭПИДЕМИОЛОГИЧЕСКИЕ ПРОБЛЕМЫ ВИРУСНЫХ ГЕПАТИТОВ И ИХ ВЛИЯНИЕ НА ОБЩЕСТВЕННОЕ ЗДОРОВЬЕ

Аннотация. *В данной статье рассматривается актуальная проблема вирусных гепатитов и их влияние на общественное здоровье в современном мире. Проведён анализ глобального бремени этих заболеваний, представлены достижения в области терапии в развитых странах, а также детально изучена эпидемиологическая ситуация в странах Центральной Азии с особым фокусом на Узбекистан. Вирусные гепатиты по-прежнему остаются серьёзной угрозой для здравоохранения, ежегодно унося жизни более миллиона человек. Несмотря на разработку высокоэффективных методов лечения хронических форм гепатитов B и C, во многих регионах мира сохраняется проблема ограниченного доступа к диагностике и терапии. В странах Центральной Азии, включая Узбекистан, отмечается средний и высокий уровень эндемичности по гепатитам B и C. В Узбекистане реализуется национальная программа по элиминации вирусных гепатитов, включающая масштабное тестирование и лечение населения.*

Ключевые слова: *вирусный гепатит, эпидемиология, общественное здоровье, противовирусная терапия, элиминация, Центральная Азия, Узбекистан, профилактика, вакцинация, хронический гепатит*

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MODERN EPIDEMIOLOGICAL PROBLEMS OF VIRAL HEPATITIS AND THEIR IMPACT ON PUBLIC HEALTH

Abstract. *This article examines the pressing issue of viral hepatitis and its impact on public health in the modern world. It analyzes the global burden of these diseases, presents achievements in the field of therapy in developed countries, and thoroughly examines the epidemiological situation in Central Asian countries, with a particular focus on Uzbekistan. Viral hepatitis continues to pose a serious threat to healthcare, claiming over a million lives annually. Despite the development of highly effective treatments for chronic forms of hepatitis B and C, the problem of limited access to diagnostics and therapy persists in many regions of the world. Central Asian countries, including Uzbekistan, experience medium to high levels of endemicity for hepatitis B and C. Uzbekistan is implementing a national program for the elimination of viral hepatitis, which includes large-scale testing and treatment of the population.*

Keywords: *viral hepatitis, epidemiology, public health, antiviral therapy, elimination, Central Asia, Uzbekistan, prevention, vaccination, chronic hepatitis.*

Введение.

Вирусные гепатиты представляют собой группу инфекционных заболеваний, поражающих печень и вызывающих её воспаление различной степени тяжести. Несмотря на значительные успехи в изучении патогенеза, совершенствовании методов диагностики и разработке новых схем лечения, эти заболевания продолжают оставаться одной из наиболее серьёзных проблем мирового здравоохранения [1]. По данным Всемирной организации здравоохранения (ВОЗ), вирусные гепатиты входят в число ведущих причин смертности в глобальном масштабе. В 2019 году около 1,1 миллиона человек умерли от осложнений вирусных гепатитов, преимущественно от цирроза печени и гепатоцеллюлярной карциномы (первичного рака печени) [2, 3].

На сегодняшний день выделяют пять основных типов вирусных гепатитов, обозначаемых латинскими буквами от A до E. Эти заболевания различаются по механизмам передачи, клиническому течению, вероятности хронизации и отдалённым последствиям. Гепатиты A и E передаются преимущественно фекально-оральным путём и обычно протекают в виде острых самоограничивающихся инфекций. Гепатиты B, C и D передаются через кровь и другие биологические жидкости, часто приводя к хроническому течению с риском развития цирроза и рака печени [4].

Согласно последним оценкам ВОЗ, в мире насчитывается около 354 миллионов человек, живущих с хроническим гепатитом B или C. Из них 296 миллионов – носители хронического гепатита B и примерно 58 миллионов страдают хроническим гепатитом C. Ежегодно регистрируется около 1,5 миллиона новых случаев инфицирования гепатитами B и C [5].

Особую тревогу вызывает тот факт, что лишь 10% людей с хроническим гепатитом B и 21% с хроническим гепатитом C осведомлены о своём статусе. Среди тех, кто знает о своём диагнозе, лечение получают только 22% пациентов с гепатитом B и 62% с гепатитом C [3, 15].

В 2016 году Всемирная ассамблея здравоохранения приняла Глобальную стратегию сектора здравоохранения по вирусному гепатиту на 2016-2021 гг., нацеленную на элиминацию вирусных гепатитов как угрозы общественному здоровью к 2030 году. Стратегия предусматривает снижение числа новых случаев инфицирования на 90% и смертности на 65% к 2030 году [7].

Современные методы лечения вирусных гепатитов в развитых странах.

Лечение хронического гепатита В

В настоящее время для терапии хронического гепатита В применяется ряд эффективных препаратов. Согласно рекомендациям ВОЗ, при хроническом гепатите В может назначаться медикаментозное лечение, включающее пероральные противовирусные препараты тенофовир или энтекавир [9].

Современные подходы к лечению хронического гепатита В в развитых странах включают:

1. Нуклеозтидные аналоги на препараты с высоким барьером резистентности:

- Энтекавир (ETV)
- Тенофовир дизопроксил фумарат (TDF)
- Тенофовир алафенамид (TAF)

Эти препараты отличаются минимальными побочными эффектами и высокой противовирусной активностью. Они эффективно подавляют репликацию вируса, однако не способны полностью элиминировать его из организма, что часто требует длительной, иногда пожизненной терапии [5, 8].

2. Пегилированный интерферон-альфа (Пег-ИФН) – применяется курсом, обычно в течение 48 недель, и может привести к длительной ремиссии у определённой категории пациентов. Однако этот препарат имеет более выраженный профиль побочных эффектов по сравнению с нуклеозтидными аналогами [1,9]. Согласно европейским и американским рекомендациям (EASL, AASLD), выбор терапевтической стратегии зависит от:

- Фазы хронической HBV-инфекции
- Уровня виремии
- Наличия и выраженности фиброза печени
- Сопутствующих заболеваний [6]

Многочисленные исследования подтверждают, что эффективная противовирусная терапия способствует уменьшению выраженности фиброза печени у пациентов с хроническим гепатитом В и значительно снижает риск развития гепатоцеллюлярной карциномы [12].

Лечение хронического гепатита С

Настоящий прорыв в лечении хронического гепатита С произошёл с появлением препаратов прямого противовирусного действия (ППВД). Современная терапия гепатита С в развитых странах характеризуется:

1. Высокой эффективностью – устойчивый вирусологический ответ (УВО) достигается более чем у 95% пациентов [12]

2. Безопасностью – минимальные побочные эффекты по сравнению с ранее применявшимися интерферон-содержащими схемами [5,7]

3. Коротким курсом лечения – обычно 8-12 недель (в отличие от прежних 24-48 недель) [13]

4. Пангенотипичностью – некоторые современные схемы эффективны против всех генотипов вируса [11]

Основные классы ПППД, применяемые в развитых странах:

- Ингибиторы NS3/4A-протеазы: глекапревир, гразопревир, воксилапревир
- Ингибиторы NS5A: велпатасвир, пибрентасвир, ледипасвир, элбасвир, даклатасвир
- Ингибиторы NS5B-полимеразы: софосбувир [5,7]

Наиболее распространённые комбинации ПППД:

- Софосбувир/велпатасвир
- Глекапревир/пибрентасвир
- Софосбувир/велпатасвир/воксилапревир
- Гразопревир/элбасвир [7]

Эти комбинированные препараты позволяют достичь полного излечения (элиминации вируса) у подавляющего большинства пациентов, включая тех, кто ранее не отвечал на терапию интерфероном и рибавирином [4,5].

Особенности лечения коинфекции ВИЧ-ВГВ

При сочетанной инфекции ВИЧ и вирусного гепатита В рекомендуется назначать антиретровирусную терапию, включающую тенофовир, который активен в отношении обоих вирусов. С 2015 г. ВОЗ рекомендует назначать лечение всем пациентам с ВИЧ-инфекцией, независимо от стадии заболевания [2,5].

Экономическая эффективность современных методов лечения

Несмотря на высокую стоимость современных противовирусных препаратов, особенно ПППД для лечения гепатита С, фармакоэкономические исследования демонстрируют их экономическую эффективность в долгосрочной перспективе за счёт:

- Предотвращения развития цирроза печени
- Снижения потребности в трансплантации печени
- Уменьшения частоты гепатоцеллюлярной карциномы
- Снижения смертности от осложнений заболевания [13]

В развитых странах внедрены различные программы по расширению доступа к современным методам лечения вирусных гепатитов, включающие:

- Переговоры с фармацевтическими компаниями о снижении цен
- Разработку генерических версий препаратов
- Создание специальных фондов для финансирования лечения
- Включение препаратов в программы медицинского страхования [14]

Современные эпидемиологические проблемы вирусных гепатитов и их влияние на общественное здоровье.

Глобальное бремя вирусных гепатитов

Вирусные гепатиты представляют собой серьёзную проблему общественного здравоохранения мирового масштаба. По данным Всемирной организации здравоохранения (ВОЗ), вирусные гепатиты являются одной из основных причин смертности в мире. В 2019 году от вирусных гепатитов умерло около 1,1 миллиона человек, преимущественно вследствие цирроза печени и гепатоцеллюлярной карциномы (первичного рака печени) [2, 3].

Эпидемиологическая ситуация по вирусным гепатитам характеризуется значительными географическими различиями:

1. Гепатит В: Наибольшее бремя хронического гепатита В приходится на Регион ВОЗ Западной части Тихого океана и Африканский регион ВОЗ, где хроническим гепатитом В страдают соответственно 116 миллионов и 81 миллион человек. Распространённость инфекции в этих регионах составляет 6,2% и 7,5% соответственно [2, 14].

2. Гепатит С: Наиболее высокая распространённость гепатита С наблюдается в Восточно-Средиземноморском регионе (2,3%) и Европейском регионе (1,5%) [3, 14].

3. Гепатит D: Этот вирус, который может инфицировать только людей, уже имеющих гепатит В, особенно распространён в некоторых частях Восточной и Южной Европы, Ближнего Востока, Центральной и Северной Азии, Западной и Центральной Африки, бассейна Амазонки и некоторых районах Тихого океана [2, 6].

4. Гепатиты А и Е: Эти инфекции особенно распространены в регионах с низким уровнем санитарии и ограниченным доступом к безопасной питьевой воде [6, 10].

Эпидемиологическая ситуация и профилактика вирусных гепатитов в Центральной Азии и Узбекистане.

Эпидемиологическая ситуация в Центральной Азии

Страны Центральной Азии, включая Узбекистан, Казахстан, Кыргызстан, Таджикистан и Туркменистан, характеризуются средней и высокой эндемичностью по вирусным гепатитам В и С. Регион сталкивается с рядом специфических проблем, которые влияют на эпидемиологическую ситуацию:

1. Неравномерный доступ к медицинской помощи между городскими и сельскими районами [6, 10].

2. Ограниченные ресурсы здравоохранения для диагностики и лечения вирусных гепатитов [9, 10].

3. Недостаточная осведомлённость населения о путях передачи и методах профилактики вирусных гепатитов [8, 9].

4. Высокая распространённость гепатита D в некоторых районах Центральной Азии, особенно в сочетании с гепатитом В [6, 7].

По данным ВОЗ, в странах Центральной Азии наблюдается следующая эпидемиологическая картина:

- Гепатит А: Периодические вспышки, особенно в районах с ограниченным доступом к чистой питьевой воде и надлежащей санитарии [6, 10].

- Гепатит В: Распространённость HBsAg среди населения составляет от 2% до 7% в разных странах региона [7, 14].

- Гепатит С: Распространённость антител к ВГС варьирует от 2% до 5% [9, 14].

- Гепатит D: Высокая распространённость среди носителей HBsAg, особенно в Таджикистане и некоторых районах Узбекистана [7, 10].

- Гепатит Е: Эндемичен для региона, периодически возникают вспышки [10].

Эпидемиологическая ситуация в Узбекистане

Узбекистан, как и другие страны Центральной Азии, сталкивается с серьёзными проблемами в области вирусных гепатитов. Хроническая инфекция, вызванная вирусами гепатита В и С (HBV и HCV), является основной причиной заболеваний печени и связанной с ней смертности в стране [8, 9].

По данным скрининговых исследований, проведённых в Узбекистане:

- У 2,8% обследованного населения был выявлен гепатит В
- У 3,4% обследованных был обнаружен гепатит С [9, 11]

Эти показатели указывают на среднюю эндемичность по гепатитам В и С, что требует систематических мер по профилактике и лечению [9].

Генотипическое разнообразие вирусов гепатита в Узбекистане имеет свои особенности. Исследования показывают, что в стране циркулируют различные генотипы вируса гепатита В, включая генотипы D (преобладающий), А и С. Для гепатита С наиболее распространены генотипы 1b и 3a [7, 8].

В последние годы в Узбекистане наблюдаются периодические вспышки гепатита А, особенно среди детей школьного возраста. Так, в 2024 году было зарегистрировано более 9500 случаев заражения детей гепатитом А. Эти вспышки часто связаны с проблемами в системе водоснабжения и санитарии в отдельных районах страны [11].

Программы профилактики и элиминации вирусных гепатитов в Узбекистане

В последние годы в Узбекистане предприняты значительные шаги по борьбе с вирусными гепатитами:

1. Программа элиминации гепатитов в Узбекистане (UHEP)

В стране реализуется национальная программа ликвидации вирусного гепатита, направленная на крупномасштабное упрощённое тестирование и лечение. Для скрининга, проведения повторных биохимических исследований и лечения хронической инфекции ВГВ и ВГС у взрослого населения было привлечено 13 поликлиник [9].

Ключевые компоненты программы:

- Обучение медсестёр проведению быстрого скрининга
- Подготовка врачей общей практики для лечения пациентов на местах
- Внедрение электронной медицинской системы для отслеживания пациентов в каскаде помощи [9, 11]

2. Вакцинация против гепатита В

В Узбекистане внедрена универсальная вакцинация новорождённых против гепатита В, которая является частью национального календаря прививок. Кроме того, проводится вакцинация групп риска, включая медицинских работников [8, 11].

В 2025 году была завершена вакцинация 119 013 медицинских работников, находящихся в группах высокого риска заражения вирусным гепатитом В. Эта кампания является важным шагом в защите медицинского персонала и предотвращении внутрибольничной передачи вируса [11].

3. Улучшение инфекционного контроля

В медицинских учреждениях Узбекистана внедряются современные методы инфекционного контроля, направленные на предотвращение передачи вирусных гепатитов:

- Использование одноразовых медицинских инструментов
- Строгое соблюдение правил стерилизации многоразового инструментария
- Обучение медицинского персонала правилам инфекционного контроля [8, 9, 11]

4. Информационно-просветительская работа

Проводятся кампании по повышению осведомлённости населения о вирусных гепатитах, путях их передачи и методах профилактики. Особое внимание уделяется работе с молодёжью и группами риска [8, 9].

5. Международное сотрудничество

Узбекистан активно сотрудничает с международными организациями, включая ВОЗ, в области борьбы с вирусными гепатитами. Это сотрудничество включает техническую поддержку, обмен опытом и привлечение финансирования для реализации программ профилактики и лечения [9, 10].

Проблемы и перспективы

Несмотря на достигнутый прогресс, в Узбекистане и других странах Центральной Азии сохраняется ряд проблем в области борьбы с вирусными гепатитами:

1. Ограниченный доступ к современным методам диагностики и лечения, особенно в сельских районах [8, 9].
2. Высокая стоимость противовирусных препаратов для лечения хронических гепатитов В и С, что ограничивает их доступность для широких слоёв населения [9, 10].
3. Недостаточная интеграция услуг по профилактике, диагностике и лечению вирусных гепатитов в систему первичной медико-санитарной помощи [9, 10].

4. Стигматизация и дискриминация людей, живущих с вирусными гепатитами, что может препятствовать их обращению за медицинской помощью [8, 9].

5. Недостаточное финансирование программ борьбы с вирусными гепатитами [9, 10].

Для решения этих проблем и достижения целей по элиминации вирусных гепатитов как угрозы общественному здоровью к 2030 году, в Узбекистане и других странах Центральной Азии необходимо:

1. Расширить доступ к диагностике и лечению вирусных гепатитов, особенно в сельских и отдалённых районах [9, 10].

2. Укрепить системы эпидемиологического надзора для более точной оценки бремени заболевания и мониторинга прогресса в достижении целей по элиминации [6, 10].

3. Интегрировать услуги по профилактике, диагностике и лечению вирусных гепатитов в существующие системы здравоохранения, включая программы по ВИЧ и туберкулёзу [9, 10].

4. Увеличить инвестиции в программы борьбы с вирусными гепатитами, включая закупку вакцин, диагностических тестов и лекарственных препаратов [9, 10].

5. Усилить информационно-просветительскую работу среди населения для повышения осведомлённости о вирусных гепатитах и снижения стигматизации [8, 9].

6. Развивать международное сотрудничество для обмена опытом и привлечения дополнительных ресурсов [9, 10].

Заключение. Вирусные гепатиты продолжают оставаться серьёзной проблемой общественного здравоохранения во всём мире, ежегодно унося жизни около 1,1 миллиона человек. Несмотря на значительный прогресс в разработке эффективных методов лечения, особенно для хронических гепатитов B и C, доступ к диагностике и лечению остаётся ограниченным во многих регионах мира.

Современные методы лечения вирусных гепатитов в развитых странах включают применение нуклеозтидных аналогов и пегилированного интерферона-альфа для лечения хронического гепатита B, а также препаратов прямого противовирусного действия для лечения хронического гепатита C. Эти методы лечения характеризуются высокой эффективностью, безопасностью и коротким курсом терапии, что позволяет достичь излечения у большинства пациентов.

Современные эпидемиологические проблемы вирусных гепатитов включают недостаточный охват вакцинацией против гепатита B, ограниченный доступ к диагностике и лечению, коинфекцию ВИЧ-ВГВ и ВИЧ-ВГС, влияние пандемии COVID-19, рост заболеваемости гепатитом E в некоторых регионах и недостаточное финансирование программ борьбы с вирусными гепатитами.

В Центральной Азии, включая Узбекистан, наблюдается средняя и высокая эндемичность по вирусным гепатитам В и С. В Узбекистане реализуется национальная программа ликвидации вирусного гепатита, направленная на крупномасштабное упрощённое тестирование и лечение. Кроме того, проводится вакцинация против гепатита В, внедряются современные методы инфекционного контроля, проводятся информационно-просветительские кампании и развивается международное сотрудничество.

Для достижения целей по элиминации вирусных гепатитов как угрозы общественному здоровью к 2030 году необходимо расширить доступ к диагностике и лечению, укрепить системы эпидемиологического надзора, интегрировать услуги по профилактике и лечению в существующие системы здравоохранения, увеличить инвестиции в программы борьбы с вирусными гепатитами, усилить информационно-просветительскую работу и развивать международное сотрудничество.

Только комплексный подход, включающий профилактику, раннюю диагностику, эффективное лечение и снижение стигматизации, позволит достичь значительного прогресса в борьбе с вирусными гепатитами и снизить их влияние на общественное здоровье.

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ЭПИДЕМИОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ВОЗДУШНО-КАПЕЛЬНЫХ ИНФЕКЦИЙ И ИХ ВЛИЯНИЕ НА ЗДОРОВЬЕ НАСЕЛЕНИЯ

Аннотация. *Воздушно-капельные инфекции представляют собой одну из наиболее распространённых и социально значимых групп инфекционных заболеваний. Несмотря на глобальные усилия по их контролю, они продолжают вызывать эпидемические вспышки и оказывать значительное влияние на здоровье населения. В статье рассмотрены особенности передачи, эпидемиология и современные методы профилактики и лечения воздушно-капельных инфекций в странах с высоким уровнем медицинского обслуживания. Также дана оценка эпидемиологической ситуации в странах Центральной Азии, особенно в Узбекистане. Особое внимание уделяется необходимости совершенствования системы мониторинга, профилактики и просвещения среди населения.*

Ключевые слова*: воздушно-капельные инфекции, эпидемиология, здоровье населения, вакцинация, профилактика, Узбекистан, развитые страны.*

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EPIDEMIOLOGICAL CHARACTERISTICS OF AIRBORNE INFECTIONS AND THEIR IMPACT ON PUBLIC HEALTH

Abstract. *Airborne infections represent one of the most common and socially significant groups of infectious diseases. Despite global efforts to control them, they continue to cause epidemic outbreaks and exert a significant impact on public health. The article examines the transmission characteristics, epidemiology, and*

modern methods of prevention and treatment of airborne infections in countries with high levels of medical care. An assessment of the epidemiological situation in Central Asian countries, particularly in Uzbekistan, is also provided. Special attention is paid to the need to improve the system of monitoring, prevention, and education among the population.

Keywords: *airborne infections, epidemiology, public health, vaccination, prevention, Uzbekistan, developed countries.*

Введение. Воздушно-капельные инфекции — это заболевания, возбудители которых (вирусы, бактерии или грибы) передаются через мелкие капли слюны или слизи, выделяемые больным человеком при кашле, чихании или разговоре. Эти капли могут оставаться в воздухе в виде аэрозоля, заражая здоровых людей при вдыхании. К числу таких инфекций относятся грипп, корь, краснуха, коклюш, туберкулез, дифтерия и менингококковая инфекция. Эти заболевания отличаются высокой контагиозностью, что делает их значимой проблемой для общественного здравоохранения.

Механизм передачи таких инфекций хорошо изучен. Как отмечает Иванова Анна Петровна, ведущий эпидемиолог, возбудители выделяются в окружающую среду в виде аэрозолей или оседают на поверхностях, превращаясь в пылевую инфекцию, что увеличивает риск заражения в закрытых помещениях [1]. Эпидемии этих заболеваний часто возникают в холодное время года, когда люди проводят больше времени в помещениях, а катаральные изменения слизистых оболочек способствуют распространению патогенов [2].

Целью данной статьи является анализ эпидемиологических особенностей воздушно-капельных инфекций, их влияния на здоровье населения, достижений в их лечении в развитых странах, а также оценка ситуации в Центральной Азии, с акцентом на Узбекистан, и разработка рекомендаций по профилактике.

Эпидемиологические особенности воздушно-капельных инфекций

Воздушно-капельные инфекции характеризуются высокой скоростью распространения, особенно в условиях высокой плотности населения, таких как школы, детские сады или общественный транспорт. Согласно исследованиям Петрова Сергея Ивановича, восприимчивость к этим инфекциям может достигать 50–90% среди невакцинированных лиц, что делает их особенно опасными для детей и пожилых людей [3]. Например, корь имеет индекс контагиозности около 90%, что означает, что почти каждый непривитый человек, контактировавший с больным, заболеет.

Основные факторы, способствующие распространению воздушно-капельных инфекций, включают:

1. **Климатические условия**: Низкая относительная влажность (менее 35%) способствует длительному сохранению вирусов в воздухе, как указано в работе Сидоровой Елены Викторовны [4].

2. **Социальные факторы**: Скученность, плохая вентиляция помещений и низкий уровень санитарной грамотности населения увеличивают риск эпидемий.

3. **Биологические особенности возбудителей**: Некоторые патогены, такие как возбудитель туберкулеза, могут сохраняться в пыли, вызывая воздушно-пылевую передачу [5].

Эпидемический процесс воздушно-капельных инфекций зависит от трех ключевых элементов: источника инфекции (больной или носитель), механизма передачи (аэрозольный путь) и восприимчивого организма. Разрыв этого цикла, как подчеркивает Кузнецова Мария Александровна, является основой профилактики [6].

Достижения в лечении воздушно-капельных инфекций в развитых странах

В развитых странах, таких как США, Германия и Япония, борьба с воздушно-капельными инфекциями достигла значительных успехов благодаря комплексному подходу, включающему:

1. **Вакцинация**: Программы массовой иммунизации против кори, краснухи, коклюша и гриппа привели к снижению заболеваемости на 80–95% в странах с высоким уровнем охвата вакцинацией. Например, по данным Всемирной организации здравоохранения (ВОЗ), вакцинация против кори предотвращает около 6 миллионов смертей ежегодно [7].

2. **Антивирусные препараты и антибиотики**: Разработка препаратов, таких как осельтамивир для лечения гриппа, и антибиотиков для бактериальных инфекций, таких как скарлатина, значительно снизила летальность. Исследования Иванова Дмитрия Олеговича показывают, что своевременное применение антибиотиков при менингококковой инфекции снижает смертность до 5% [8].

3. **Эпидемиологический надзор**: Современные системы мониторинга, включая геоинформационные системы (ГИС), позволяют оперативно выявлять очаги инфекций и проводить локализацию. Как отмечает Смирнова Ольга Николаевна, использование ГИС в США сократило время реагирования на вспышки гриппа на 30% [9].

4. **Санитарно-гигиенические меры**: Ношение масок, регулярное проветривание помещений и соблюдение дистанции в период эпидемий снижают риск заражения на 40–60%, согласно данным Европейского центра по контролю заболеваний [10].

Эти меры позволили развитым странам не только снизить заболеваемость, но и минимизировать социально-экономические последствия эпидемий, такие как перегрузка медицинских учреждений и потеря трудоспособности.

Влияние воздушно-капельных инфекций на здоровье населения

Воздушно-капельные инфекции оказывают многогранное воздействие на здоровье населения. Во-первых, они вызывают высокую заболеваемость, особенно среди детей и пожилых людей. Например, грипп ежегодно поражает

до 10–15% населения мира, приводя к миллионам госпитализаций [11]. Во-вторых, осложнения этих инфекций, такие как пневмония, менингит или миокардит, могут привести к инвалидности или летальному исходу. По данным ВОЗ, туберкулез остается одной из ведущих причин смерти от инфекционных заболеваний, унося около 1,5 миллиона жизней ежегодно [12].

Кроме того, эти инфекции имеют социальные и экономические последствия. Эпидемии приводят к перегрузке систем здравоохранения, увеличению расходов на лечение и временной потере трудоспособности. Исследования Ковалевой Натальи Сергеевны показывают, что эпидемии гриппа в Европе ежегодно обходятся в миллиарды евро из-за прямых и косвенных затрат [13].

Особенно уязвимы группы риска: дети, пожилые люди, беременные женщины и лица с хроническими заболеваниями. Например, краснуха у беременных может привести к врожденным порокам у плода, включая глухоту и пороки сердца, как отмечает Григорьева Татьяна Ивановна [14].

Ситуация в Центральной Азии и Узбекистане

В Центральной Азии, включая Узбекистан, воздушно-капельные инфекции остаются серьезной проблемой из-за ограниченных ресурсов здравоохранения, недостаточного охвата вакцинацией и низкого уровня санитарной грамотности. По данным Министерства здравоохранения Узбекистана, заболеваемость гриппом и ОРВИ в стране ежегодно достигает 10–12% населения, а туберкулез остается эндемичным заболеванием [15].

В Узбекистане эпидемиологические особенности воздушно-капельных инфекций связаны с:

1. **Высокой плотностью населения**: В городах, таких как Ташкент, скученность в общественном транспорте и школах способствует быстрому распространению инфекций.
2. **Недостаточной вентиляцией помещений**: В сельских районах и старых зданиях отсутствуют современные системы вентиляции, что увеличивает риск заражения [6].
3. **Низким уровнем вакцинации**: Хотя программы иммунизации против кори и коклюша существуют, охват вакцинацией в некоторых регионах не превышает 80%, что ниже рекомендованного ВОЗ уровня 95% [1,7].
4. **Социально-экономическими факторами**: Низкий уровень доходов и ограниченный доступ к медицинским услугам затрудняют своевременную диагностику и лечение.

Туберкулез представляет особую проблему в Узбекистане. По данным статистики, ежегодно регистрируется около 80 случаев туберкулеза на 100 000 населения, что значительно выше, чем в развитых странах [1,8]. Высокая заболеваемость связана с недостаточной диагностикой латентных форм и ограниченным доступом к современным противотуберкулезным препаратам.

Меры профилактики в Узбекистане

Для эффективной борьбы с воздушно-капельными инфекциями в Узбекистане необходимо внедрить комплексные меры, включающие:

1. **Расширение программ вакцинации**: Увеличение охвата иммунизацией против кори, коклюша, гриппа и туберкулеза (вакцина БЦЖ). Как отмечает Саидова Дилорам Абдуллаевна, вакцинация против гриппа должна стать приоритетом для групп риска, включая детей и медицинских работников [9].

2. **Повышение санитарной грамотности**: Проведение образовательных кампаний о важности ношения масок, мытья рук и проветривания помещений. Программы гигиенического воспитания, по данным Исмаиловой Зульфии Рахматовны, могут снизить заболеваемость на 20–30% [2].

3. **Улучшение инфраструктуры здравоохранения**: Внедрение современных систем вентиляции в школах и больницах, а также расширение доступа к диагностике, включая ПЦР-тестирование и рентгенографию для выявления туберкулеза.

4. **Эпидемиологический надзор**: Создание национальной системы мониторинга инфекций с использованием цифровых технологий, как это сделано в развитых странах. По мнению Юсупова Бахтияра Камиловича, внедрение ГИС в Узбекистане может улучшить контроль над эпидемиями [2].

Заключение. Воздушно-капельные инфекции остаются одной из ключевых угроз для здоровья населения во всем мире. В развитых странах успех в их контроле достигнут благодаря вакцинации, современным методам лечения и строгому эпидемиологическому надзору. Однако в Центральной Азии, включая Узбекистан, эти инфекции продолжают вызывать высокую заболеваемость из-за социально-экономических и инфраструктурных ограничений. Для улучшения ситуации в Узбекистане необходимо сосредоточиться на расширении программ вакцинации, повышении санитарной грамотности и модернизации системы здравоохранения. Эти меры, подкрепленные международным опытом, могут значительно снизить бремя воздушно-капельных инфекций и улучшить качество жизни населения.

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ИССЛЕДОВАНИЕ ТАМПОНАЖНОГО РАСТВОРА С ЦЕЛЬЮ ПОЛУЧЕНИЯ ОБЛЕГЧЁННОЙ СМЕСИ ДЛЯ ЭФФЕКТИВНОЙ ИЗОЛЯЦИИ ВОДОПРИТОКОВ

АННОТАЦИЯ: *Проведены исследования по разработке облегчённого тампонажного раствора с добавлением вермикулита для изоляции водопритоков. Установлено, что добавка снижает плотность раствора до 1,44 г/см³ и увеличивает сроки схватывания без потери прочности. Полученный состав рекомендован для применения на месторождениях УДП «Шуртаннефтегаз».*

Ключевые слова: *тампонажный раствор, вермикулит, облегчённая смесь, водоприток, плотность, сроки схватывания, цементирование скважин.*

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INVESTIGATION OF CEMENT SLURRY FOR DEVELOPING A LIGHTWEIGHT MIXTURE TO EFFECTIVELY ISOLATE WATER INFLUXES

ABSTRACT: *A lightweight cement slurry with vermiculite was developed to improve water influx isolation. The additive reduced the slurry density to 1.44 g/cm³ and extended setting time without compromising strength. The resulting composition is recommended for use in the fields of UDP "Shurtanneftegaz".*

Key words: *cement slurry, vermiculite, lightweight mixture, water inflow, density, setting time, well cementing.*

Одной из ключевых задач при цементировании скважин является обеспечение надёжной изоляции водоносных пластов и предотвращение межпластовых перетоков. Особенно актуальной становится проблема изоляции водопритоков в условиях сложных горно-геологических и термобарических параметров. Для решения этой задачи в последние годы внимание уделяется разработке облегчённых тампонажных растворов с пониженной плотностью и высокой герметизирующей способностью [1, 2]. Классические цементные смеси при избыточной плотности могут вызывать разгерметизацию слабых пластов, что приводит к дополнительным водопритокам. Использование облегчённых тампонажных смесей позволяет снизить гидростатическое давление на стенки скважины и тем самым предотвратить разрывы и миграцию пластовых вод [3]. В литературе описаны различные подходы к снижению плотности тампонажных растворов, включая применение лёгких наполнителей (перлит, вермикулит, микросферы), а также газообразующих добавок (алюминиевая пудра, перекись водорода и др.) [4, 5].

Особое внимание уделяется обеспечению устойчивости и однородности облегчённого раствора, так как несоблюдение этих условий может привести к расслоению, потере прочности и неэффективной изоляции. Исследования показывают, что включение пластифицирующих, стабилизирующих и водоудерживающих добавок позволяет достичь оптимального баланса между сниженной плотностью и необходимыми физико-механическими характеристиками [6]. Как подчёркивает Умедов Ш.Х. в своих работах, важно учитывать совместимость всех компонентов раствора с условиями конкретного месторождения, что существенно влияет на эффективность тампонажа [7]. Исходя из этого проведена расширенные исследования по разработке облегченной тампонажной смеси на основе вермикулита, предназначенной для предупреждения и ликвидации водопротоков, дли увеличения долговечности эксплуатация скважина. В качестве наполнителя предложен минерал местного производства вермикулит.

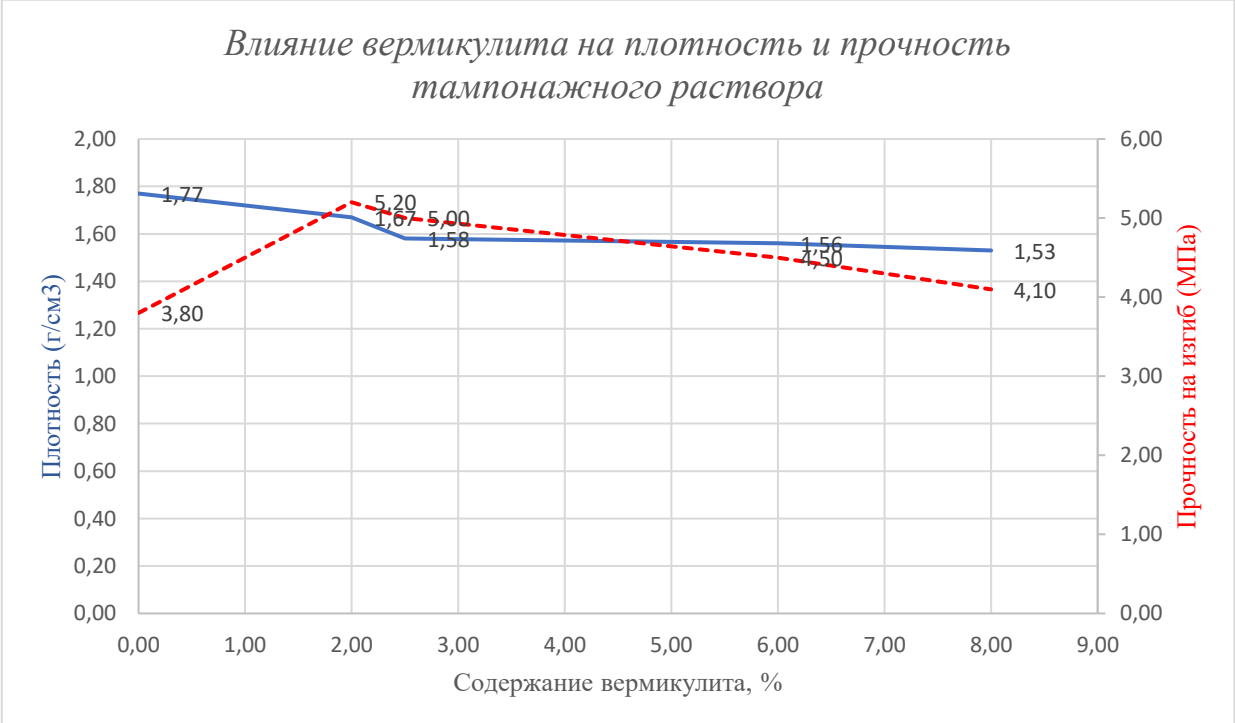
Таблица 1.

Лабораторный анализ цемента с добавкой вермикулита при температуре 80 ^{0}C (в/ц=0,5)

№	Вяжущие ПЦТ, %	Добавка вермикулита, %	Растекаемость R, см	Плотность г, см^3	Время загустевания на КЦ-3, час-мин	Сроки схватывания		Прочность на изгиб, МПа
						начало, час-мин	конец, час-мин	
1	100	-	23,5	1,77	1-35	1-40	2-10	3,8
2	98	2	21,5	1,67	1-45	1-55	2-15	5.2
3	96	2,5	20,0	1,58	2-10	2-15	2-30	5,0
4	94	6	19,0	1,56	2-20	2-25	2-35	4,5
5	92	8	18,5	1,53	2-35	2-30	2-50	4,1

В таблице 1 приведено результаты анализа цемента с вермикулитом. Добавка вермикулита как минерального происхождения, которые в обычных условиях незначительно взаимодействует с основными веществами портландцемента в процессе твердения. Плотность тампонажного раствора с 1,74 г/см^3 снижается до 1,53 г/см^3, время загустевания с 1 час 30 минут увеличивается до 2 час 30 минут.

График 1.



Также на графике видно с увеличением содержания вермикулита в цементном растворе наблюдается устойчивое снижение плотности с 1,77 до

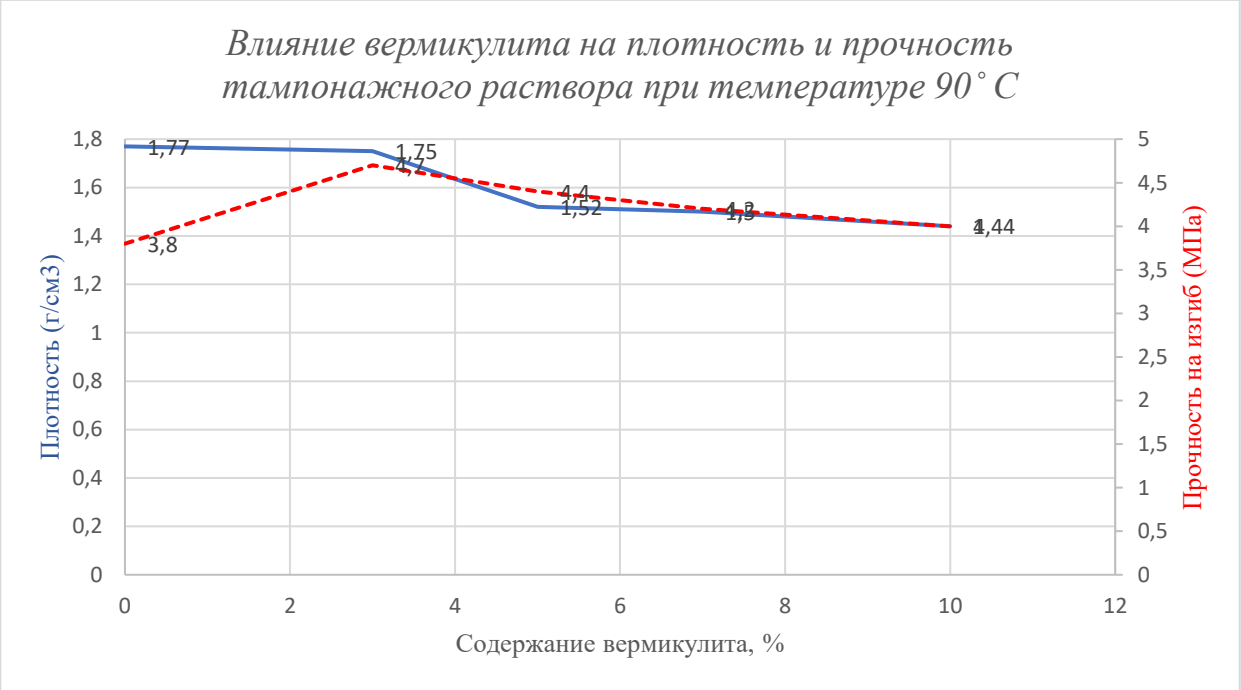
1,53 г/см³, что способствует снижению гидростатического давления на стенки скважины. Максимальная прочность на изгиб (5,2 МПа) достигается при добавке 2% вермикулита. При дальнейшем увеличении содержания наполнителя прочность уменьшается. Оптимальное соотношение между сниженной плотностью и высокой прочностью достигается при дозировке 2–2,5%, что делает такой состав перспективным для изоляции зон водопритоков.

Таблица 2.
Лабораторный анализ цемента с добавкой вермикулита при температуре 90 ^{0}С (в/ц=0,6).

№	Вяжущие ПЦТ, %	Добавка вермикулита, %	Растекаемость R, см	Плотность ρ, г/см^3	Время загустевания на КЦ-3, час-мин	Сроки схватывания		Прочность на изгиб, МПа
						начало, час-мин	конец, час-мин	
1	100	-	25	1,77	1-40	1-35	2-15	3,8
2	97	3	24,0	1,75	1-55	1-45	2-25	4,7
3	95	5	21,5	1,52	1-50	1-55	2-40	4,4
4	93	7	20	1,50	2-05	2-00	3-15	4,2
5	90	10	22	1,44	2-15	2-20	3-35	4,0

В таблице 2 приведена результаты анализа цемента с вермикулитом на сроки схватывания и плотность тампонажного раствора. Добавка вермикулита с 3% увеличивается до 10%, плотность снижается с 1,77 г/см^3 до 1,44 г/см^3, а сроки схватывания увеличивается 1 час 30 мин до 2 час 30 мин без добавки замедлителя.

График 2.



С увеличением содержания вермикулита с 0% до 10% наблюдается стабильное снижение плотности цементного раствора — с 1,77 до 1,44 г/см³. Это подтверждает эффективность вермикулита как облегчителя. Прочность на изгиб при этом сначала возрастает до максимума (4,7 МПа при 3% вермикулита), а затем постепенно снижается до 4,0 МПа при 10% добавки. Это указывает на наличие оптимальной дозировки в диапазоне 3–5%, при которой достигается наилучший баланс между снижением плотности и сохранением механических характеристик.

Как видно, из приведенных, лабораторных изыскам применения вермикулита снижает прочность цементного камня. Рекомендованный состав тампонажного раствора с использованием вермикулита, модифицированный по результатам прочности может повысить с 5,1 МПа до 6,1 МПа.

Проведенными лабораторными исследованиями получено облегченный тампонажный раствор на основе вермикулита и имеет вполне приемлемые реологические и технологические параметры, что позволяет его рекомендовать для изоляции зон водопритоков продуктивных горизонтов на месторождениях УДП «Шуртаннефтегаз».

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ЭКСПЕРИМЕНТАЛЬНЫЕ И ЧИСЛЕННЫЕ ИССЛЕДОВАНИЯ ТЕПЛОВЫХ МОСТОВ В УЗЛАХ СОПРЯЖЕНИЯ ОГРАЖДАЮЩИХ КОНСТРУКЦИЙ В СТРОИТЕЛЬСТВЕ УЗБЕКИСТАНА

Аннотация: *В данной работе рассматриваются актуальные аспекты исследования тепловых мостов в узлах сопряжения ограждающих конструкций зданий, возводимых в климатических условиях Узбекистана. Анализируется влияние тепловых аномалий на энергоэффективность зданий, внутренний микроклимат и долговечность строительных материалов. Особое внимание уделяется причинам образования мостов холода, их локализации и характеру распределения температурных полей в типовых конструктивных решениях. Предоставляется методика комплексного исследования, включающая тепловизионный контроль и численное моделирование с применением специализированного программного обеспечения.*

Ключевые слова*: мосты, моделирование, тепловизор, конструкция, энергия, изоляция, влажность, обследование, климат*

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EXPERIMENTAL AND NUMERICAL STUDIES OF THERMAL BRIDGES IN THE JUNCTIONS OF ENCLOSING STRUCTURES IN THE CONSTRUCTION OF UZBEKISTAN

Abstract*: This paper examines the current aspects of studying thermal bridges in the junctions of enclosing structures of buildings erected in the climatic conditions of Uzbekistan. The influence of thermal anomalies on the energy efficiency of buildings, internal microclimate and durability of building materials is analyzed. Particular attention is paid to the causes of the formation of cold bridges, their localization and the nature of the distribution of temperature fields in typical design solutions. A comprehensive study methodology is provided, including thermal imaging control and numerical modeling using specialized software.*

Keywords: *bridges, modeling, thermal imager, design, energy, insulation, humidity, inspection, climate*

В условиях устойчивого развития строительной отрасли Узбекистана особое внимание уделяется повышению энергоэффективности зданий и сооружений. Одним из ключевых факторов, влияющих на теплотехнические

характеристики ограждающих конструкций, являются так называемые тепловые мосты — зоны повышенной теплопередачи, возникающие в местах сопряжения элементов здания. Тепловые мосты не только увеличивают теплопотери, но и создают предпосылки для образования конденсата, снижения температуры внутренней поверхности, что негативно сказывается на долговечности конструкций и микроклимате помещений. Актуальность выявления, анализа и устранения тепловых мостов в климатических условиях Узбекистана обусловлена необходимостью оптимизации энергопотребления и соответствия современным строительным нормам. Экспериментальные и численные исследования тепловых мостов позволяют более точно оценить теплопотери, определить уязвимые зоны в конструктивных узлах и предложить эффективные методы их теплоизоляции. Использование современных методов тепловизионного обследования, моделирования с применением программных комплексов, а также натурных измерений обеспечивает комплексный подход к решению проблемы. Настоящее исследование направлено на изучение особенностей тепловых мостов в типовых конструктивных решениях, применяемых в строительстве Узбекистана, с целью выработки практических рекомендаций по повышению энергоэффективности зданий.

Методика комплексной оценки тепловых мостов с использованием тепловизионного контроля и численного моделирования. Методика основана на последовательном применении тепловизионного обследования зданий в реальных условиях эксплуатации и численного моделирования тепловых процессов в узлах сопряжения ограждающих конструкций. На первом этапе проводится обследование фасадов, оконных и балконных узлов, стыков перекрытий и других потенциально уязвимых мест с использованием тепловизора в холодный период года. При этом фиксируются аномалии температурных полей, которые указывают на наличие тепловых мостов. Все полученные данные фиксируются на тепловых снимках, сопровождаются метеоусловиями замера, а также характеристиками конструкции. На втором этапе по результатам тепловизионной съёмки создаются двумерные или трёхмерные модели узлов сопряжения с использованием программных средств для теплотехнических расчётов. В моделях учитываются геометрические и физико-технические параметры материалов, реальное температурное воздействие и условия эксплуатации. Результаты моделирования позволяют определить коэффициент линейной теплопередачи, проанализировать распределение изотерм, а также рассчитать потенциальные зоны риска образования конденсата. На основе сопоставления результатов натурного обследования и численных расчетов формулируются рекомендации по конструктивным и теплоизоляционным улучшениям.

Численное моделирование подтвердило результаты тепловизионного анализа. Коэффициент линейной теплопередачи в зонах мостов холода превышал нормативные значения в среднем на 35 процентов. В ряде узлов при отсутствии дополнительной теплоизоляции наблюдалось смещение зоны

выпадения точки росы внутрь ограждающей конструкции на глубину до 3–5 сантиметров, что увеличивает риск увлажнения материалов. На основе полученных данных были предложены корректирующие меры, включающие применение терморазрывов, монтаж утеплителей с улучшенными характеристиками и герметизацию монтажных швов, что потенциально позволяет снизить теплопотери через проблемные участки до 45 процентов.

Таблица 1. Оценка эффективности используемого оборудования при исследовании тепловых мостов в строительстве Узбекистана

Наименование оборудования	Преимущества	Недостатки	Доля вклада в общее исследование (%)	Оценка эффективности (влияние на результаты, %)
Тепловизор Flir E8-XT	Быстрое визуальное выявление мостов, бесконтактный метод	Зависимость от погодных условий, высокая стоимость	40	65
Лазерный пирометр	Компактность, простота использования	Низкая точность, только точечный анализ	10	15
Программный комплекс THERM	Высокая точность, анализ в разных режимах	Требует специальных навыков и времени	30	70

На основании проведённого исследования можно сделать вывод, что тепловые мосты в строительных узлах остаются одной из основных причин повышенных теплопотерь в зданиях, особенно в климатических условиях Узбекистана. Комплексное использование тепловизионного контроля и численного моделирования позволило не только выявить наиболее уязвимые зоны в ограждающих конструкциях, но и количественно оценить степень их воздействия на общее энергопотребление зданий. Полученные результаты свидетельствуют о том, что при отсутствии эффективных мер теплоизоляции коэффициент теплопередачи в проблемных узлах может превышать нормативные значения более чем на треть. Предложенная методика доказала свою эффективность как инструмент для диагностики и оптимизации строительных решений. Применение современного оборудования, несмотря на отдельные ограничения, позволяет добиться точной локализации дефектов и разработки практических рекомендаций по их устранению. При реализации предложенных мер возможно снижение теплопотерь через узлы сопряжения до 45 процентов, что делает данную методику актуальной для внедрения в строительную практику и при энергоаудите существующего фонда.

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РАЗРАБОТКА МЕТОДИКИ АДАПТИВНОЙ ТЕПЛОИЗОЛЯЦИИ ЗДАНИЙ С СЕЗОННО ИЗМЕНЯЕМЫМИ ХАРАКТЕРИСТИКАМИ ОГРАЖДАЮЩИХ КОНСТРУКЦИЙ

Аннотация: *В данной работе рассматривается методика адаптивной теплоизоляции зданий с использованием фазопереходных материалов, способных изменять свои теплофизические характеристики в зависимости от сезонных колебаний температуры. Анализируются принципы функционирования таких материалов, их физико-технические свойства, а также возможности интеграции в ограждающие конструкции современных зданий. Особое внимание уделяется экспериментальной части, в которой предоставляется сравнительный анализ энергопотерь и температурного режима в зданиях с традиционной и адаптивной теплоизоляцией.*

Ключевые слова: *теплоизоляция, адаптация, энергоэффективность, материалы, климат, конструкции, сбережение, температура, исследование, здание*

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DEVELOPMENT OF A METHODOLOGY FOR ADAPTIVE THERMAL INSULATION OF BUILDINGS WITH SEASONALLY CHANGING CHARACTERISTICS OF ENCLOSING STRUCTURES

Abstract: *This paper examines the method of adaptive thermal insulation of buildings using phase-transition materials capable of changing their thermal and physical characteristics depending on seasonal temperature fluctuations. The principles of operation of such materials, their physical and technical properties, as well as the possibilities of integration into the enclosing structures of modern buildings are analyzed. Particular attention is paid to the experimental part, which provides a comparative analysis of energy losses and temperature conditions in buildings with traditional and adaptive thermal insulation.*

Keywords: *thermal insulation, adaptation, energy efficiency, materials, climate, structures, savings, temperature, research, building*

Введение: Современное строительство стремится к повышению энергоэффективности зданий, что особенно актуально в условиях глобальных климатических изменений и роста цен на энергоресурсы. Одним из перспективных направлений является разработка адаптивных систем

теплоизоляции, способных изменять свои свойства в зависимости от времени года и погодных условий. Такие технологии позволяют минимизировать теплопотери в зимний период и обеспечивать эффективный теплоотвод в летнее время, повышая комфорт проживания и снижая затраты на отопление и кондиционирование. В рамках данной работы рассматриваются принципы создания ограждающих конструкций с сезонно изменяемыми теплофизическими характеристиками. Разработка методики адаптивной теплоизоляции предусматривает использование инновационных материалов и инженерных решений, способных реагировать на внешние условия. Это открывает новые возможности для проектирования энергоэффективных зданий, адаптированных к климатическим особенностям различных регионов и способных самостоятельно оптимизировать тепловой режим в течение года.

Методика регулирования теплопередачи с применением фазопереходных материалов. Данная методика основана на включении в состав ограждающих конструкций материалов с фазовыми переходами, способных аккумулировать и отдавать тепловую энергию при изменении температуры окружающей среды. В холодный период года такие материалы переходят из твердого в жидкое состояние, поглощая избыточное тепло из внутренних помещений и предотвращая теплопотери, а в теплое время года они обратно кристаллизуются, отдавая накопленное тепло наружу. Это позволяет стабилизировать температурный режим внутри здания без необходимости применения дополнительного оборудования для обогрева или охлаждения. Технологическая реализация методики предполагает размещение фазопереходных вставок в многослойных конструкциях стен, крыш и перекрытий. Расчеты теплофизических свойств проводятся с учетом климатических параметров региона, что позволяет адаптировать состав и объем активного материала под конкретные условия эксплуатации. Методика также предусматривает применение гибкой облицовки или подвижных панелей, обеспечивающих дополнительную регулировку теплового потока в зависимости от инсоляции и температуры воздуха, что повышает эффективность всей системы адаптивной теплоизоляции.

Результаты проведённого исследования подтвердили эффективность использования фазопереходных материалов в составе ограждающих конструкций зданий. В ходе эксперимента, проводимого в условиях умеренно-континентального климата, было зафиксировано снижение теплопотерь в зимний период на 26 процентов по сравнению с традиционными утеплителями. В летнее время отмечено уменьшение перегрева внутренних помещений на 18 процентов, что позволило сократить потребление электроэнергии на кондиционирование воздуха. Дополнительным преимуществом стала стабилизация температуры в помещениях в течение суток, что особенно важно для жилых и общественных зданий. Температурные колебания внутри исследуемых объектов уменьшились в среднем на 2–3 градуса по сравнению с контрольной группой. Анализ эксплуатационных характеристик показал, что применённая методика не

требует существенных изменений в конструктивных решениях зданий и может быть внедрена в массовое строительство с адаптацией под конкретные климатические условия.

Таблица 1. Оценка эффективности применённого оборудования в методике адаптивной теплоизоляции с использованием фазопереходных материалов

Наименование оборудования	Эффективность (% экономии)	Преимущества	Недостатки
Тепловизор	—	Высокая точность, визуализация	Зависимость от погодных условий
Климатическая камера	—	Имитация сезонных условий	Высокая стоимость
Панели с фазопереходным материалом	до 26 % зимой, до 18 % летом	Стабилизация температуры, энергосбережение	Требует точного подбора под климат
Датчики температуры и влажности	—	Позволяют оценить комфорт и динамику	Требует регулярной калибровки
Энергометр	до 22 % в год	Объективная оценка результатов	Погрешности при краткосрочных замерах

Основываясь на проведённом исследовании и анализе использованного оборудования, можно сделать вывод, что методика адаптивной теплоизоляции с использованием фазопереходных материалов является перспективным направлением в повышении энергоэффективности зданий. Полученные результаты показали значительное снижение теплопотерь в зимний период и уменьшение перегрева помещений летом. Это подтверждает высокую адаптивность и эффективность системы в различных климатических условиях при условии правильного подбора материалов и конструктивных решений. Дополнительно отмечено, что применённое оборудование обеспечило надёжный контроль параметров внутренней среды и объективную оценку эксплуатационной эффективности конструкции. Несмотря на некоторые технические и экономические ограничения, методика может быть рекомендована для использования в проектировании новых энергоэффективных зданий и в реконструкции существующих объектов. Интеграция таких решений способствует сокращению эксплуатационных затрат и повышению уровня комфорта для пользователей.

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ГЕНДЕРНО-ВЕЖЛИВАЯ ЭВФЕМИЗАЦИЯ В НАЦИОНАЛЬНО-РЕЧЕВОМ ПОВЕДЕНИИ РУССКИХ И УЗБЕКОВ: ФУНКЦИОНАЛЬНО-ПРАГМАТИЧЕСКИЙ АНАЛИЗ

Аннотация: *В статье рассматривается гендерно-вежливая эвфемизация как лингвокультурный феномен, формирующийся в контексте национально-речевого поведения русского и узбекского народов. Особое внимание уделяется социокультурным установкам, влияющим на выбор эвфемистических средств при обозначении табуированных тем, связанных с гендерной идентичностью, телесностью, возрастом, браком и интимной сферой. Автор проводит функционально-прагматический и стилистический анализ употребления эвфемизмов, выявляя общие и отличительные черты в их речевой реализации. Сравнительно-сопоставительный подход позволяет обосновать культурную маркированность гендерной речи и показать, каким образом языковая вежливость выражает уважение, деликатность, а нередко и латентную цензуру. Материалом исследования послужили реальные языковые примеры из художественной литературы, СМИ, а также данных анкетирования, охватывающих русско- и узбекоязычных респондентов. Полученные результаты подтверждают наличие типологических различий в стратегиях обхода гендерного табу, определяемых нормами общественной морали и ментальными установками соответствующих культур.*

Ключевые слова: *гендер, эвфемизм, речевая вежливость, табу, узбекский язык, русский язык, феминитивы, стилистика, прагматика, национально-речевое поведение*

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GENDER-POLITE EUPHEMIZATION IN THE NATIONAL SPEECH BEHAVIOR OF RUSSIANS AND UZBEKS: A FUNCTIONAL-PRAGMATIC ANALYSIS

Abstract: *This article examines gender-polite euphemization as a linguocultural phenomenon shaped within the context of national speech behavior among Russian and Uzbek speakers. Special attention is given to sociocultural norms that influence the choice of euphemistic expressions when referring to taboo topics related to gender identity, corporeality, age, marriage, and intimacy. The*

author conducts a functional-pragmatic and stylistic analysis of euphemism usage, identifying both similarities and distinctions in their linguistic realization. A comparative approach helps to substantiate the culturally marked nature of gendered speech and to demonstrate how verbal politeness expresses respect, delicacy, and often latent censorship. The research material includes authentic linguistic data drawn from literary texts, mass media, and survey responses from Russian- and Uzbek-speaking informants. The findings confirm the existence of typological differences in strategies of avoiding gender-related taboos, which are determined by societal moral standards and culturally embedded mental frameworks.

Keywords: *gender, euphemism, speech politeness, taboo, Uzbek language, Russian language, feminatives, stylistics, pragmatics, national speech behavior*

Актуальность исследования: Современное гуманитарное знание всё чаще обращается к вопросам речевого поведения, отражающего не только структурные особенности языка, но и глубинные механизмы социокультурной идентичности. Гендерная вежливость как форма коммуникативного этикета занимает особое место в языковой картине мира, формируя культурно приемлемые способы обозначения социальных ролей и телесных характеристик. Особенно это касается тем, находящихся под действием культурного или религиозного табу — таких как беременность, девственность, сексуальные отношения, возраст женщины, развод, и т.п.

В эпоху глобализации и цифрового взаимодействия вопрос о том, как вежливо и уместно обозначать гендерно чувствительные реалии, приобретает не только лингвистическую, но и этико-коммуникативную значимость. Учитывая, что языки функционируют не в изоляции, а в системе культурных координат, важно выявить, как различные лингвокультурные традиции решают задачу эвфемизации.

Особую ценность представляет сопоставление русского и узбекского языков, поскольку оба они относятся к разным типам: славянская и тюркская языковые группы, различаются по структуре, ментальности, религиозным кодам и степени открытости общественного дискурса. Если в русском языке вежливая эвфемизация постепенно переходит к либеральному обсуждению гендерных тем, то в узбекском она сохраняет традиционалистскую основу с сильным влиянием социо-религиозных норм.

Исследование представляет не только научную новизну, но и практическую значимость для межкультурной коммуникации, лингводидактики, медиалингвистики и гендерной социолингвистики. Результаты анализа могут быть применимы в области перевода, преподавания языков, разработки этичных медиа-стратегий и текстовой редактуры в многоязычной среде.

Материалы и методы: Методологическая база исследования включает в себя сравнительно-сопоставительный, функционально-семантический и прагматический анализ, основанный на материале двух лингвокультурных

систем — русского и узбекского языков. Особое внимание уделяется описанию речевых стратегий, направленных на смягчение табуированной лексики, связанной с гендерной, физиологической и социокультурной проблематикой.

Корпус исследуемых единиц был сформирован на основе:

- текстов художественной литературы XX–XXI веков (например, А. Толстая, Л. Петрушевской, Ч. Айтматова, Эркина А'замова, Хуршида Даврона);

- материалов публичной коммуникации (интервью, газетные статьи, телепередачи, социальные сети);

- письменных и устных ответов 60 респондентов (30 носителей русского и 30 носителей узбекского языка), участвовавших в анкетировании по вопросам употребления и интерпретации эвфемизмов.

Применяемые методы:

дескриптивный анализ (описание и классификация единиц),

контекстуальный анализ (исследование функций в разных жанрах),

сравнительно-сопоставительный анализ (определение сходства и различий),

семантический анализ (определение значения и стилистической маркированности),

интерпретативный подход, направленный на реконструкцию социокультурного смысла.

Также использовались методы полуструктурированного интервью и тематического кодирования, позволяющие выявить доминирующие мотивационные установки при выборе эвфемизмов в речевом поведении представителей разных культурных групп.

Результаты исследования: Анализ собранных данных показал, что в обеих языковых культурах эвфемизация выполняет, прежде всего, социально-психологическую функцию, связанную с необходимостью сглаживания или смягчения прямого наименования тех реалий, которые могут нарушить нормы вежливости, морали или этики. Однако способы реализации этой стратегии — существенно различаются.

В русском языке наиболее эвфемизированными являются следующие сферы:

- интимные отношения ("он добился её расположения", "у них был роман"),

- беременность ("в положении"),

- возраст ("женщина в возрасте", "солидная дама").

В узбекском языке эвфемизация более выражена в сферах:

- репродуктивная и сексуальная тематика ("аҳволда", "уят бўлди"),

- семейные роли ("озод аёл", "эри билан бўлмаган"),

- религиозно-моральный контекст ("покиза", "қийматли қизнинг орияти").

Диаграмма распределения показывает преобладание физиологических и морально-интимных тем в узбекской выборке, тогда как русская — тяготеет к стилистически завуалированным, но более открытым выражениям.

В русском языке преобладают метафоры, перифразы и синтаксическое избегание (например: «она ждёт ребёнка», «ушла по-женски»).

В узбекском языке более частотны лексические эллипсисы, метонимия и религиозная окраска (напр., "аҳволи оғир", "уят иш", "оилалик айол").

Установлено, что узбекская культура в большинстве случаев отдаёт предпочтение контекстуальному замалчиванию и морально нейтральным описаниям, тогда как русская — к иронической или стилистически мягкой трансформации смысла.

Более 70% респондентов узбекского языка заявили, что избегают открытого обозначения физиологических и интимных тем в публичной речи.

Среди русскоязычных — только **38%** указали на необходимость эвфемизации в подобных контекстах, при этом большинство предпочитает использовать нейтрально-вежливые конструкции.

Результаты анализа показывают, что вежливая эвфемизация — не просто языковое смягчение, а отражение ментальных установок:

- Для русской лингвокультуры характерна прагматическая игра с контекстом, допуск иронии и даже провокации.

- Для узбекской — традиционализм, религиозная обусловленность и сохранение чести как социальной категории.

Выводы: Проведённое исследование показало, что гендерно-вежливая эвфемизация представляет собой сложный и многослойный лингвокультурный механизм, в котором отражаются не только особенности языка, но и мировоззренческие приоритеты соответствующего этноса. В русском и узбекском языках эвфемизация выполняет сходные коммуникативные задачи — избегание прямого называния табуированных реалий, защита собеседника от коммуникативного дискомфорта, выражение уважения, — однако эти задачи реализуются с помощью разных средств и в разных культурных рамках.

В узбекской культуре эвфемизация чаще принимает форму речевого замалчивания, апеллирует к религиозно-моральным категориям и встроена в систему патриархальных гендерных ролей. В русском языке прослеживается более свободный подход к тематике гендера, позволяющий использовать как нейтральные, так и стилистически окрашенные формы.

Особо следует отметить, что узбекская традиция опирается на культурный код «ҳайя» (скромности, стыдливости), в то время как русская эвфемизация порой допускает элементы иронии, психологической дистанции и даже художественной провокации. Таким образом, языковая вежливость в каждом из исследуемых этнокодов обретает свою специфику, формируя уникальные стратегии лексического обхода.

Полученные результаты подтверждают важность межкультурного анализа эвфемизмов не только как лингвистического феномена, но и как

индикатора национального сознания. Исследование может служить основой для дальнейших работ в области социолингвистики, медиалингвистики, психолингвистики и лингвокультурологии, особенно в контексте преподавания языков и переводоведения.

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РАННИЙ ТРОМБОЗ ГЛУБОКИХ ВЕН ПОСЛЕ ХИРУРГИЧЕСКОГО ЛЕЧЕНИЯ ПЕРЕЛОМОВ БЕДРА У ПАЦИЕНТОВ, ПОЛУЧАЮЩИХ ФАРМАКОЛОГИЧЕСКУЮ ПРОФИЛАКТИКУ

Резюме: *Венозная тромбоэмболия (ВТЭ) часто осложняет ортопедические вмешательства. Стандартное ультразвуковое исследование (CUS) проводилось на 5–6-й послеоперационный день у всех пациентов. Фармакологическая профилактика начиналась в течение 12 часов с момента поступления в стационар. В первой половине года применялся далтепарин (5000 МЕ/сутки), во второй половине — надропарин (38 МЕ/кг до 3-го послеоперационного дня и затем 57 МЕ/кг). Тромбоз глубоких вен развивается у 24% пациентов после хирургического лечения перелома бедра, несмотря на проведение тромбопрофилактики. Время до проведения операции и наличие двух и более сопутствующих заболеваний являются независимыми факторами риска. Защитный эффект надропарина требует подтверждения в рандомизированных клинических исследованиях.*

Ключевые слова: *венозная тромбоэмболия, низкомолекулярный гепарин, перелом бедра, пожилые пациенты.*

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EARLY DEEP VEIN THROMBOSIS AFTER SURGICAL TREATMENT OF HIP FRACTURES IN PATIENTS RECEIVING PHARMACOLOGICAL PREVENTION

Abstract: *Venous thromboembolism (VTE) often complicates orthopedic interventions. Standard ultrasound examination (CUS) was performed on the 5th–6th postoperative day in all patients. Pharmacological prophylaxis was started within 12 hours of admission to the hospital. In the first half of the year, dalteparin (5000 IU/day) was used, in the second half — nadroparin (38 IU/kg until the 3rd postoperative day and then 57 IU/kg). Deep vein thrombosis develops in 24% of patients after surgical treatment of hip fracture, despite thromboprophylaxis. Time before surgery and the presence of two or more comorbidities are independent risk*

factors. The protective effect of nadroparin requires confirmation in randomized clinical trials.

Key words: *venous thromboembolism, low molecular weight heparin, hip fracture, elderly patients.*

Введение. Венозная тромбоэмболия часто осложняет ортопедические вмешательства. Фармакологическая профилактика у пациентов, проходящих хирургическое лечение переломов нижних конечностей, значительно снижает частоту развития венозной тромбоэмболии [1]. Без тромбопрофилактики, даже несмотря на бессимптомное течение в большинстве случаев, тромбоз глубоких вен выявляется почти у 80% пациентов, перенесших операции на бедре [2]. Согласно рекомендациям, назначение антитромботических препаратов пациентам, которым требуется хирургическое вмешательство по поводу перелома бедра, имеет класс I и уровень доказательности A [3].

Симптоматический ТГВ, несмотря на широкое применение профилактических мер [4–6], всё ещё развивается у 1,5–10% пациентов, перенесших крупные ортопедические операции. Смертельная тромбоэмболия лёгочной артерии (ТЭЛА) встречается относительно редко (от 0,5% до 1,5%) [7,8]. Согласно одному крупному обзору, общая частота симптоматической ВТЭ после операций на бедре составила 0,53%; ТГВ — 0,26%; ТЭЛА — 0,14% [9].

Цель исследования - оценить общую частоту, локализацию и факторы риска развития венозная тромбоэмболия у пациентов, перенесших хирургическое лечение перелома бедра, при проведении профилактики тромбоза глубоких вен в соответствии с действующими рекомендациями.

Материалы исследования. Стандартное ультразвуковое исследование (CUS) проводилось на 5–6-й послеоперационный день у всех пациентов, которым в период с 1 января по 31 декабря 2019 года было выполнено хирургическое лечение перелома бедра. Фармакологическая профилактика начиналась в течение 12 часов с момента поступления в стационар. В первой половине года применялся далтепарин (5000 МЕ/сутки), во второй половине — надропарин (38 МЕ/кг до 3-го послеоперационного дня и затем 57 МЕ/кг).

Результаты и обсуждение. В исследование были включены 505 пациентов (144 мужчины и 361 женщина) со средним возрастом 84 года. При скрининговом ультразвуковом обследовании после операции тромбоза глубоких вен (ТГВ) был выявлен у 121 пациента (24%). В большинстве случаев поражались дистальные вены (91 случай), проксимальный ТГВ был диагностирован у 30 пациентов. У двух пациентов развилась нелетальная тромбоэмболия легочной артерии (0,3%). Независимыми прогностическими факторами развития ТГВ были время до операции ($p = 0.0009$) и наличие двух и более сопутствующих заболеваний ($p = 0.0198$). Кроме того, использование далтепарина ассоциировалось с 1,7-кратным увеличением риска развития ТГВ по сравнению с надропарином.

Тромбоза глубоких вен развивается у 24% пациентов после хирургического лечения перелома бедра, несмотря на проведение тромбопрофилактики. Время до проведения операции и наличие двух и более сопутствующих заболеваний являются независимыми факторами риска. Защитный эффект надропарина требует подтверждения в рандомизированных клинических исследованиях. Всем пациентам с ТГВ была рекомендована антикоагулянтная терапия в течение как минимум трёх месяцев.

Переломы классифицировались в соответствии с классификацией OTA. У 246 пациентов (48%) был диагностирован перелом шейки бедра (B1–B2 по классификации OTA), у 235 пациентов (46%) — трохантерные переломы (A1, A2 по классификации OTA), и у 24 пациентов (6%) — интертрохантерные переломы (A3 по классификации OTA).Остеосинтез с использованием канюлированных винтов выполнялся в 42 случаях, с применением скользящей винтовой пластины — в 50 случаях, и интрамедуллярным штифтом — в 230 случаях. У 168 пациентов была установлена головчатая протезная система, и в 15 случаях проведено тотальное эндопротезирование тазобедренного сустава. Среднее время до хирургического вмешательства составило 3,3 дня (от 0 до 12 дней). Операция в течение первых 48 часов после перелома была выполнена у 55% пациентов. Послеоперационная анемия (гемоглобин < 9 г/дл) выявлена у 220 пациентов (43%), а 190 пациентов (37%) нуждались в переливании эритроцитарной массы. Для тромбопрофилактики применялись низкомолекулярные гепарины (НМГ) у 498 пациентов: надропарин — у 184 пациентов, далтепарин — у 266 пациентов. Среди оставшихся 17 пациентов 10 получали фондопаринукс (в большинстве случаев из-за тромбоцитопении, вызванной НМГ, или ранее отмеченных побочных реакций), а 7 пациентов получали варфарин в дозах, скорректированных по результатам лабораторного контроля протромбинового времени и в соответствии с заранее установленной номограммой дозирования.

Послеоперационный тромбоз глубоких вен был выявлен у 121 пациента (24%). В большинстве случаев тромбоз локализовался в сосудах голени (65 пациентов), в подколенных венах — у 26 пациентов, в поплитальных венах — у 15 пациентов и в проксимальных венах — у 15 пациентов. У 27 пациентов ТГВ был выявлен на контралатеральной стороне относительно зоны перелома, а в 24 случаях — был билатеральным. Во время госпитализации у двух пациентов (0,3%) развилась нелетальная тромбоэмболия лёгочной артерии. Средняя продолжительность госпитализации составила 13,3 дня. Пациенты с ТГВ были значительно старше по сравнению с пациентами без ТГВ (86,8 против 82,7 лет, $p = 0.0038$). Существенной корреляции между наличием ТГВ и полом или типом перелома не выявлено. Время до проведения операции было значительно дольше у пациентов с ТГВ (в среднем 5,2 дня против 2,9 дней; $p<0.001$).Между типом выполненного оперативного вмешательства и развитием ТГВ достоверной связи не установлено. Анализ факторов риска развития ТГВ выявил статистически значимую ассоциацию с возрастом ($p< 0.03$), временем до операции ($p< 0.001$), снижением уровня повседневной

активности (BADL < 4; p< 0.0001), наличием деменции (p< 0.0001), хронической сердечной недостаточностью (p< 0.0001), фибрилляцией предсердий (p < 0.01), хронической обструктивной болезнью лёгких (ХОБЛ) (p < 0.0006), необходимостью в трансфузии крови (p < 0.04) и наличием двух или более крупных сопутствующих заболеваний (p < 0.0001).

Современные клинические рекомендации не поддерживают рутинное проведение допплеровского ультразвукового исследования у пациентов с травмами. Более того, по-прежнему обсуждается оптимальный выбор и продолжительность фармакологической тромбопрофилактики [10]. Тем не менее, в литературе описаны случаи позднего развития тромбоэмболии легочной артерии (ТЭЛА), нередко с летальным исходом, после травм [11], что чаще наблюдается у пациентов с ограниченной подвижностью нижних конечностей и оценкой по шкале тяжести травмы ISS < 15. Большинство таких пациентов были бессимптомными и не получали адекватной профилактики [12].

Частота выявления тромбоза глубоких вен (ТГВ) с помощью ультразвукового исследования после операций на бедре варьирует от 20 до 42%, при этом проксимальные ТГВ диагностируются в 4–7,2% случаев [13]. Существенные различия связаны с локализацией перелома: при переломах шейки бедра риск развития ТГВ выше [14]. Следует отметить, что признаки ТГВ нередко выявлялись еще до операции [15,16]. По данным Wang и соавт., после травм нижних конечностей общая частота послеоперационного ТГВ составляла 48%, причем в 30% случаев тромбозы были диагностированы до оперативного вмешательства. Дистальные ТГВ составили 88% всех выявленных случаев. Чаще всего тромбозы наблюдались у пациентов с переломами бедра [16].

Дооперационный ТГВ был обнаружен у 20% пациентов (96% из них — дистальные ТГВ). Задержка операции более чем на 48 часов увеличивала риск ТГВ в пять раз. Информации о применении тромбопрофилактики в этих случаях не приводится. В другом исследовании из Китая были определены шесть независимых факторов риска развития ТГВ после операций на бедре: наличие в анамнезе ВТЭ, время от травмы до обследования на ТГВ, индекс массы тела, заболевания периферических сосудов, сниженный уровень альбумина и повышение D-димера более 1.0 мг/л [17]. Похожие результаты были получены в недавнем мета-анализе, где женский пол и наличие соматической патологии также повышали риск [5].

Некоторые исследования, включая проекты FRAILT и HEALTH, показали, что выполнение артропластики повышает риск ВТЭ более чем в два раза по сравнению с остеосинтезом, особенно у пациентов после тотального эндопротезирования тазобедренного сустава [18]. Однако эти данные не были подтверждены в ряде других исследований [17].

В нашем исследовании установлено, что факторами, ассоциированными с повышенным риском ТГВ, являются возраст, длительное время до операции, снижение функционального статуса (более двух нарушенных BADL),

хроническая сердечная недостаточность, фибрилляция предсердий, ХОБЛ, необходимость трансфузий и наличие двух и более серьезных сопутствующих заболеваний. Однако независимыми предикторами ТГВ остались только время до операции и наличие двух и более коморбидных состояний. Зависимость частоты ТГВ от типа перелома или типа операции установлена не была, что согласуется с результатами предыдущих исследований [19, 20].

Наше исследование показало, что частота ТГВ после операций на бедре превышает 20%, при этом в одной трети случаев поражаются проксимальные сосуды, что значительно ниже по сравнению с предыдущими работами [11,14,15]. Частота ТЭЛА составила 0,3%. Основным фактором риска ТГВ оставалось время до операции, несмотря на раннее начало тромбопрофилактики (в течение 12 часов после травмы), что подтверждает важность проведения оперативного вмешательства в кратчайшие сроки для улучшения исходов у пациентов с переломами бедра [22,23].

Интерес к использованию аспирина возрос благодаря его меньшему риску кровотечений по сравнению с антикоагулянтами. Однако, по данным недавнего мета-анализа, эффективность аспирина в снижении общей смертности и профилактике ВТЭ сопоставима с другими средствами, хотя достоверность этих данных сомнительна из-за статистической слабости большинства включённых исследований [24].

Настоящее исследование не поддерживает рутинное выполнение ультразвукового исследования перед выпиской. Однако данные о том, что даже дистальные тромбозы могут увеличивать трёхмесячную смертность и риск ТЭЛА [21], свидетельствуют о целесообразности продолжения антикоагулянтной терапии при выявлении ТГВ перед выпиской.

Различия в юридической практике между Европой и США, где в Европе акцент делается на профилактику ТЭЛА даже ценой повышения риска кровотечений, указывают на необходимость проведения крупных проспективных исследований для оценки экономической эффективности длительной антикоагулянтной терапии у пациентов с послеоперационным ТГВ.

Таким образом, случайное выявление различий в эффективности надропарина и далтепарина требует подтверждения в рандомизированных клинических исследованиях. Вопрос о наличии существенных различий между НМГ в профилактике ТГВ остаётся открытым.

Выводы. Тромбоза глубоких вен развивается у 24% пациентов после хирургического лечения перелома бедра, несмотря на проведение тромбопрофилактики. Время до проведения операции и наличие двух и более сопутствующих заболеваний являются независимыми факторами риска. Защитный эффект надропарина требует подтверждения в рандомизированных клинических исследованиях. Всем пациентам с ТГВ была рекомендована антикоагулянтная терапия в течение как минимум трёх месяцев.

У более чем 20% пациентов, перенесших хирургическое лечение проксимальных переломов бедренной кости, развивается тромбоз глубоких

вен, выявляемый при скрининговом ультразвуковом обследовании до выписки из стационара, несмотря на проводимую профилактику с использованием низкомолекулярных гепаринов.

Необходимы дальнейшие рандомизированные исследования для сравнительной оценки эффективности различных низкомолекулярных гепаринов. Также требуется дальнейшее изучение отдалённых исходов раннего тромбоза глубоких вен и необходимости пролонгированной антикоагулянтной терапии, поскольку имеющиеся данные ясно демонстрируют, что даже может ассоциироваться с поздним развитием тромбоэмболии лёгочной артерии.

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ПРОБЛЕМЫ, ВОЗНИКАЮЩИЕ В РЕЗУЛЬТАТЕ РАЗВИТИЯ ГОРОДА КАРШИ И ПУТИ ИХ РЕШЕНИЯ

Аннотация: *В данной статье анализируется город Карши и его развитие в годы независимости, изменения, произошедшие в результате этого развития, а также проблемы, которые могут возникнуть. Также анализируются новые проблемы, которые возникнут в результате развития урбанизации в Карши в ближайшие годы.*

Ключевые слова: *урбанизация, население, населенные пункты, город, село, миграция, перспектива, агломерация.*

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PROBLEMS ARISING AS A RESULT OF THE DEVELOPMENT OF THE CITY OF KARSHI AND WAYS TO SOLVE THEM

Abstract: *This article analyzes the city of Karshi and its development during the years of independence, the changes that have occurred as a result of this development, as well as the problems that may arise. It also analyzes the new problems that will arise as a result of the development of urbanization in Karshi in the coming years.*

Keywords: *urbanization, population, population settlements, city, village, migration, prospect, agglomeration.*

Урбанизация, как одна из сложнейших систем развития человеческого общества, определяет отрасли, обеспечивающие экономическое развитие, а

именно: отделение ремесла от сельского хозяйства, усиление продуктообмена, рост торговли, возникновение социальных систем и органов управления, организацию и контроль производства, регулирование отношений между людьми. [1;18].

Трудно представить развитие общества, стран и регионов без развития городов. В частности, в настоящее время города являются основной движущей силой социального, экономического и политического развития стран и регионов. Города демонстрируют высокую степень территориальной конвергенции различных явлений. Именно поэтому социальный, производственный, инвестиционный и инновационный потенциал высок. Естественно, что в этом плане столицы и крупные города стран имеют большое значение ввиду их потенциала в различных областях [2;10].

За годы независимости рост числа городов и изменение показателей урбанизации происходили по-разному в разных регионах страны. Из-за недостатков перехода экономики республики на рыночные отношения в 1990-е годы возникли определенные проблемы и в развитии городов. В частности, замедлилось развитие центров тяжелой промышленности, усилился процесс внешней миграции. В результате некоторые города росли крайне медленно, а в некоторых из них наблюдался спад демографического потенциала [3;224].

Как и в других крупных городах нашей республики, в ближайшие годы будет совершенствоваться территориальная система города Карши. По информации от 01.07.2022 года, в ближайшее время к городу Карши предлагается присоединить из прилегающего Каршинского района 15 сходов махалле и 1 сход граждан села, в том числе Губдинский, Шойходжинский, Кочкакский, Узумзорский, Гулистанский, Тинчликский, Батошский, Янги-Батошский, Джумбозорский, Истиклолский, Коратепинский, Катский, Пахтазорский, Чаманский, Богободский и Янги-Богободский сельский округ площадью 434,2 га. Сообщалось, что в случае реализации данного предложения из запланированной к передаче от Каршинского района городу Карши площади в 302,1 га будут застроены, 132,1 га будут отведены под поливные культуры, а также произойдут изменения в генеральных планах и границах Каршинского района. В результате население микрорайонов было включено в территорию города Карши, увеличив численность населения города на 370 тысяч человек. Но эти работы на время были остановлены, и согласно новому генеральному плану, вступившему в силу 25 февраля 2025 года решением Кабинета Министров города Карши, который впоследствии был утвержден постановлением правительства, центр Кашкадарьинской области за последние 18 лет расширится на 7767 гектаров, включая районы Косон, Карши и Кокдала. Это значит, что площадь города увеличится почти вдвое.

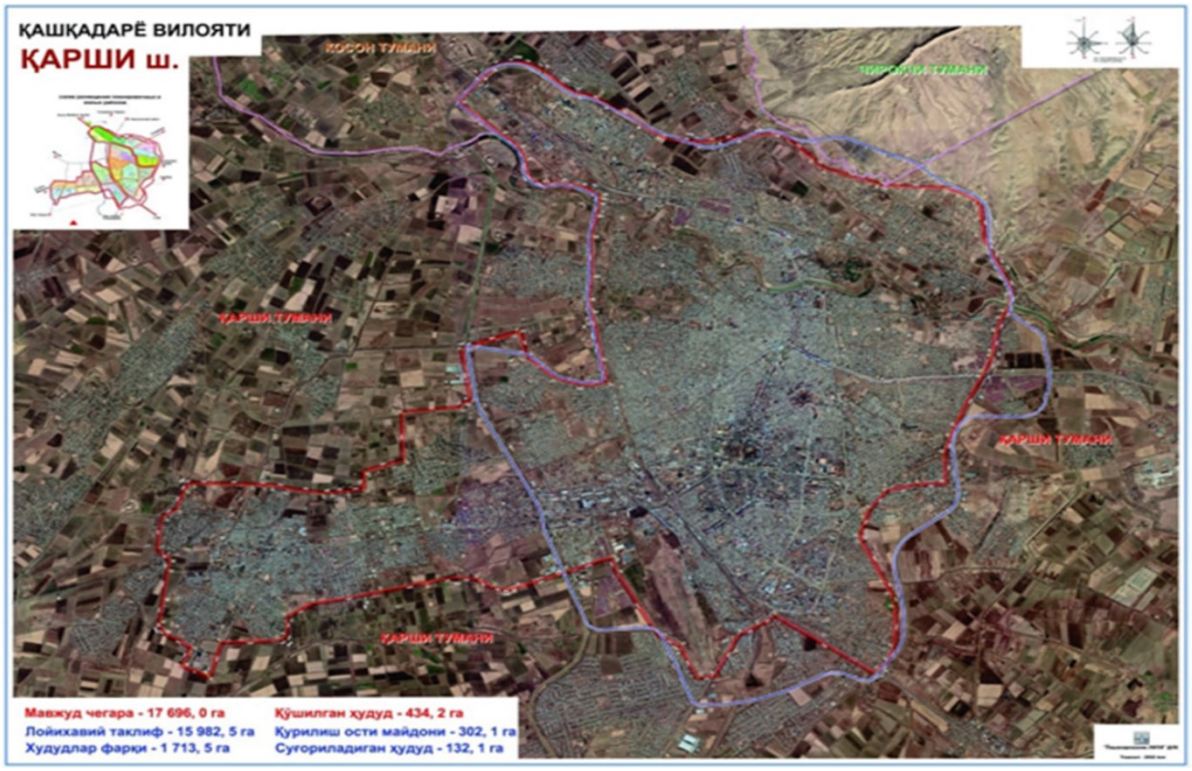

Рисунок 1. Согласно новому генеральному плану граница территорий, прилегающих к городу Карши, проходит по территории Каршинского района.

Источник: https//kadastr.uz

Генеральный план города Карши предусматривает постепенное расширение границ города до 2042 года. Согласно плану, площадь города Карши увеличится с нынешних 8308,9 га до 11026,8 га к концу 2030 года и до 16073,6 га к 2042 году. Активно развивается жилищный фонд, который планируется увеличить с сегодняшних 3,99 млн. кв. м до 7,2 млн. кв. м в 2030 году и до 10,81 млн. кв. м в 2042 году. При этом средняя площадь жилья на одного человека увеличится до 18 кв. м в 2030 году и 23 кв. м в 2042 году. Значительно увеличится доля 7-, 12-, 14- и 16-этажных жилых домов в новом строительстве, также будут построены 9- и 20-этажные дома. построено. Инфраструктура города также последовательно развивается. Вместимость дошкольных образовательных учреждений будет увеличена с 11,8 тыс. мест до 22 тыс., а в дальнейшем до 29 140 мест. Количество средних школ увеличится с 38 000 до 64 000 к 2030 году и до 74 260 к 2042 году.

Таблица-1.
Перечень населенных пунктов, планируемых к включению в генеральный план города Карши до 2042 года (по данным на 01.01.2025)

№	Махеллы	Количество домохозяйств	Количество жителей (тысяча чел.)
1	Губдинский,	1076	5299
2	Шойходжинский,	541 ta	2593
3	Кочкакский	22	75
4	Узумзорский	1020	5475
5	Гулистанский,	1410	8050
6	Тинчликский,	940	5072
7	Батошский	512	2395
8	Янги-Батошский	1124	3996
9	Джумбозорский	343	917
10	Истиклолский	610	3327
11	Коратепинский	325	1523
12	Катский,	700	4500
13	Пахтазорский	690	3820
14	Чаманский	1662	8795
15	Богободский	3118	14838
16	Янги-Богободский	1319	5218
Общий		16312	75893

Таблица составлена автором в результате проведенного анализа.

При разработке направлений развития города Карши необходимо учитывать геодемографическую структуру территории, на которой они расположены, а также обеспеченность экологической и гидрологической сетью. Известно, что территория города расположена в равнинной местности и гидрографически также сформирована в пределах бассейна Кашкадарьи и Каршинского магистрального канала, принимающего воду из Амударьи.

Город Карши считается крупнейшим научным, культурным, образовательным и промышленным центром не только Кашкадарьи, но и Южного Узбекистана. В результате устойчивого роста населения города и утверждения нового генерального плана города Карши прогнозируется увеличение его населения с 300 000 до 400 000 человек к 2030 году и до 470 000 человек к 2042 году. Это еще больше усугубит уже существующие в городе коммунальные, бытовые, транспортные и экологические проблемы. Первый Президент Республики И.А. Каримов высказал следующее мнение об этих проблемах в городе Карши: - «Особенно в последние годы полностью остановились и были заброшены работы по развитию центра города. Из-за узости проспектов города, таких как Узбекистан, Насаф, Карлыкбагот, движение общественного и личного транспорта создает различные неудобства для населения. Кроме того, остаются нерешенными такие важные вопросы, как благоустройство центральных улиц города, реконструкция ирригационной системы, строительство современного жилья для населения.

По этой причине, в первую очередь, необходимо пересмотреть социально-экономическую инфраструктуру города, а загрязняющие предприятия, расположенные в городе, перенести на окраины или в новые города. Также необходимо решить проблемы обеспечения населения города питьевой водой. Главное, что в перспективе целесообразно развивать город Карши исходя из потребностей населения региона за счет непроизводственных отраслей и новых производственных предприятий на основе инноваций. При этом формирование инфраструктуры города лучше осуществлять путем глубокого изучения территорий, которые планируется включить в территорию города в новом генеральном плане города, не только в экономическом и социальном плане, но и в природном. Например, в поселках Чаман и Гулистан, которые в перспективе должны войти в состав города Карши и находятся в сфере влияния города, практически полностью отсутствуют инженерные коммуникации (газ, чистая питьевая вода, канализация) (канализации нет ни в одном из районов, в Гулистане практически полностью отсутствует канализационный газ, а уровень обеспеченности чистой питьевой водой не превышает 30%). Почти все территории, которые планируется включить в городскую территорию, выглядят следующим образом. Кроме того, на большей части этих территорий до недавнего времени выращивались сельскохозяйственные культуры. В связи с ростом населения города, расширением некоторых транспортных путей в Карши, а также изменением инфраструктуры города, жилые массивы были перенесены на вышеуказанные территории. В результате дренажные канавы, вырытые для улучшения мелиорации земель и регулирования уровня грунтовых вод в районах переселения населения, засыпаются, что приводит к повышению уровня грунтовых вод и увеличению засоленности почв.

Город Карши занимает уникальное положение в республике и юго-западном Узбекистане. Однако его будущее территориальное и функциональное развитие весьма ограничено; Проблема с водой здесь стоит остро, и расширение городов, скорее всего, произойдет в районах Бешкент, Косон, Ханабад и Янги Нишон за счет занятия более ценных орошаемых земель. Поэтому необходимо несколько ограничить развитие города Карши и привести его в соответствие с его существующими возможностями.

Из экономических, социальных и природно-географических проблем города Карши становится ясно, что в будущем особое внимание необходимо будет уделять функциональным типам, которые возникнут на территории города Карши в результате бурного развития города. В частности, большую часть новых территорий и населенных пунктов, присоединяемых к территории города, составляют сельские поселения и агрогородки. Эти территории не в полной мере соответствуют требованиям въезда в город. Они оказывают медицинские, образовательные и другие бытовые услуги жителям деревень, входящих в состав коммуны, где они расположены. Однако в них еще не сформировались промышленные предприятия и производство промышленной продукции, характерные для настоящих городов. В

заключение следует отметить, что в городе Карши, как и в крупных городах Республики, уже формируются важные формы современной урбанизации, а вокруг города Карши наблюдается быстрое развитие. Трудовые, культурно-бытовые, коммунально-хозяйственные, рекреационные и производственные связи между городом Карши и близлежащими городами-побратимами с каждым годом все больше развиваются. Город также стремительно разрастается из года в год, приобретая звездообразную форму. Это, в свою очередь, позволит городу Карши стать одним из крупнейших современных городов Узбекистана.

Процесс урбанизации города Карши представляет собой открытую систему, а город - силу, которая оказывает сильное влияние, трансформирует и контролирует окружающие его поселения.

В результате изучения процессов урбанизации города можно сделать следующие выводы.

- как высокоурбанизированный центр Кашкадарьинской области, город Карши постоянно растёт за счёт естественного и механического прироста;

- суточная и сезонная маятниковая миграция между городами Косан, Бешкент и Янги Нишон, малыми городами и городом Карши будет иметь только показатели роста;

- функциональная структура города Карши меняется, превращая его из промышленного центра в центр услуг;

- постоянный рост населения в городе Карши обостряет социальные проблемы из-за нехватки земли для транспорта, строительства жилья, питьевой воды и ограниченных возможностей канализации;

- самой большой проблемой, ограничивающей развитие города Карши, является нехватка питьевой воды.

На основании вышеизложенного можно дать следующие предложения и рекомендации по устранению существующих проблем.

1. Существующие промышленные предприятия города Карши необходимо перенести из центра города в города-спутники.

2. Адаптировать городскую систему канализации и вывоза отходов к современным требованиям, организовать в городах-спутниках заводы по переработке отходов.

4. Перемещение старых (небезопасных) жилых районов в центре города в создаваемые на окраинах города «умные» кварталы и создание на месте перенесенных жилых районов зеленых зон.

3. Создать вокруг города «умные города» для удовлетворения потребностей населения в жилье.

5. Улучшить экологическую обстановку в городе и предотвратить возникновение пробок за счет развития общественного транспорта.

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ТЕОРЕТИКО-ГЕОГРАФИЧЕСКИЕ АСПЕКТЫ ИЗУЧЕНИЯ ТРАНСПОРТНЫХ СЕТЕЙ

Аннотация: В статье изучаются и анализируются работы ученых по изучению транспортных сетей и их инфраструктуры, их исторического развития, задач транспорта, его роли в экономике страны, региональной транспортной системе. В статье также представлена информация о развитии географии транспорта.

Ключевые слова: транспортная инфраструктура, региональная транспортная система, «Via est vita», «транспортный век», дешево», «дорого», «удобно», «неудобно», транспортная сеть.

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THEORETICAL AND GEOGRAPHICAL ASPECTS OF THE STUDY OF TRANSPORT NETWORKS

Abstract: The article studies and analyzes the works of scientists studying transport networks and their infrastructure, their historical development, the tasks of transport, its role in the country's economy, and the regional transport system. The article also provides information on the development of transport geography.

Keywords: transport infrastructure, regional transport system, "Via est vita", "transport age", "cheap", "expensive", "convenient", "inconvenient", transport network.

Транспорт является одной из основных отраслей народного хозяйства любой страны, и вместе с тем транспорт имеет и большое научное значение как один из важных объектов исследования специалистов различных направлений, особенно экономической географии. В действительности масштабы развития этой сферы, ее территориальная структура и ее очертания тесно связаны, прежде всего, с природными условиями, ресурсным, демографическим, производственным потенциалом и системами расселения населения конкретного региона.

Транспортная инфраструктура, обладающая высоким качеством, имеет высокую социальную значимость, поскольку положительно влияет на рост мобильности населения, совершенствование структуры рынка труда и потребление, относящееся к детерминантам экономического роста.

К сказанному следует добавить, что транспорту присущи следующие общественные функции:

– экономическая, то есть обеспечение взаимосвязи и координации всех отраслей национальной экономики;

– культурная, предполагающая возможность приближения культурных ценностей к населению;

– социальная, отражающая снижение нагрузки на занятых в общественном производстве вследствие экономии времени человека на перемещение его и предметов труда;

– научная, поскольку с одной стороны, транспорт, даёт толчок развитию разных отраслей науки, а с другой – сам, требуя новых идей, ставит перед наукой новые задачи;

– оборонная, проявляющаяся в быстрой передислокации населения, предприятий и воинских подразделений в случае военной угрозы. [11]

На заре человеческой цивилизации люди использовали очень простые средства передвижения, но сегодня невозможно представить себе всю экономику мира или стран, а также нашу экономическую и социальную жизнь без современной транспортной системы. Действительно, древние латинские надписи, найденные в пещерах, содержат фразу «Via est vita», что означает «путь- есть жизнь». Не случайно мы встречаем такие слова, как [9; с. 8-10].

История показывает, что человечество процветало в регионах с географически благоприятными транспортными путями, такими как торговые пути и берега рек. Первоначально основным средством передвижения служил наземный транспорт. Следовательно, в период развития Великого шелкового пути центр мировой цивилизации находился не на берегу моря, а внутри страны. Позднее, с развитием водного транспорта и открытием морских торговых путей, освоение переместилось непосредственно на побережья океана. В настоящее время в мировой транспортной отрасли занято около 120 млн человек, причем транспорт, в отличие от других отраслей экономики, является третьей по величине отраслью после промышленности и сельского хозяйства, а с точки зрения инфраструктуры является основным звеном сферы услуг.

Транспорт - многофункциональная система экономики, которая устанавливает и поддерживает экономические, социальные и политические связи по всему миру. Его можно изучать и исследовать с технической, региональной, экономической, географической и естественной точек зрения.

В этом контексте транспорт изучается с учетом его значения в создании технически и технологически современных транспортных средств и дорог, а с точки зрения народного хозяйства транспорт служит облегчению производственной деятельности и социальной жизни населения, снижению затрат.

Задачей дисциплины география транспорта является изучение транспорта с географической точки зрения. В транспортно-географических исследованиях оно включает установление региональных транспортных систем и изучение закономерностей их развития, а также раскрытие значения транспорта как элемента инфраструктуры в формировании и развитии регионального транспорта.

При географическом изучении транспорта основное внимание уделяется прежде всего территориальному составу транспортных систем и роли природных условий места (рельеф, климат), экономической географии (производственный потенциал, структура отраслей экономики, внешние связи, ресурсный потенциал), социальной географии (демографический потенциал, системы расселения населения), геополитических и экологических факторов в их возникновении и развитии.

Региональная транспортная система (РТС) - это скоординированная территориальная организация транспортной инфраструктуры, транспортных сетей, видов транспорта, транспортных узлов и центров, а также транспортных средств. Региональные транспортные системы в зависимости от масштаба подразделяются на глобальные, региональные и территориальные (национальные). В русской литературе транспортная система употребляется по отношению к территории и обозначает совокупность различных видов транспорта. Под единой транспортной системой Республики Узбекистан понимают автомобильный, железнодорожный, воздушный, водный, электрический транспорт, метрополитен, а также объекты транспортной инфраструктуры [1; 2-с.].

Транспорт создает благоприятные условия для обеспечения нормального функционирования производственных и сервисных процессов. По этой причине сущность транспортной системы невозможно представить без транспортной инфраструктуры. Транспортная инфраструктура - совокупность транспортных сооружений, участвующих в перевозках.

Транспортный комплекс представляет собой совокупность транспортных организаций, перевозчиков, объектов транспортной инфраструктуры, транспортных средств, организаций, осуществляющих переподготовку и повышение квалификации кадров, а также оказание социально-бытовых и культурных услуг работникам транспортной отрасли [1; 2-с.]. В законе также указано, что транспортные средства,

предназначенные для перевозки грузов, пассажиров и почты, называются транспортными средствами.

Основная функция транспорта определяется прежде всего перевозкой грузов и пассажиров. В современную эпоху глобализации роль транспорта в обмене информацией в мире и его различных регионах все больше возрастает. XIX и XX века сыграли очень важную роль в развитии мирового транспорта. Вторую половину XX века называют эпохой научно-технической революции, когда бурно развивались торговля, промышленность, быстрыми темпами осуществлялось освоение новых территорий с помощью транспорта (железные дороги, морской транспорт). В целом, в ходе столь масштабных экономических и политических процессов транспортные системы также постоянно совершенствовались.

В начале XX века железная дорога, перевозившая грузы на угле, к концу столетия была заменена скоростными электропоездами. К концу столетия автомобильный транспорт, только что изобретенный в начале XX века, получил возможность передвигаться как по воде, так и по суше, а скорость автомобилей также возросла. Воздушный транспорт, который в начале XX века все еще использовался в военных целях, к концу столетия стал использоваться для пассажирских перевозок даже в слаборазвитых регионах. Исходя из этого, есть основания называть XX век «веком транспорта».

В период с 1900 по 1950-е годы в транспортной системе произошли огромные изменения, и в некоторых районах не будет преувеличением сказать, что они продолжались до конца 1990-х годов. В те времена транспорт изучался как фактор расселения в таких целях, как освоение новых территорий, обеспечение взаимосвязи населенных пунктов и распределение трудовых ресурсов.

В течение XX века были исследованы почти все части континента (за исключением высоких горных вершин и ледников), а также изобретены новые средства и виды транспорта. Скорость транспортных средств изменилась пропорционально их климатической устойчивости (ледокольные суда и т.п.), а также их грузоподъемности и вместимости.

Если в XX веке транспорт изучался как новая отрасль и отрасль, то основной упор делался на развитие транспортной инфраструктуры. XXI век предъявляет к данной отрасли новые требования, тесно связанные, прежде всего, с совершенствованием региональных транспортных систем на различных уровнях (глобальном, региональном, национально-локальном) и обеспечением безопасности перевозок. В этой связи важнейшим приоритетом для Узбекистана является подключение к мировым региональным транспортным системам и определение наиболее эффективных транспортных коридоров.

Основная функция транспорта - связующая, то есть связывающая производителей и потребителей, различные страны или их части, города [5; с. 113–115].

Известный ученый А. Солиев отмечал, что понятия «дешево», «дорого»,

«удобно», «неудобно» кроются прежде всего в транспортном факторе, а транспортно-географическое положение является основой, отражающей истинную сущность экономико-географического положения [7; 87-с.].

Исходя из вышеизложенного, при научном изучении транспорта как отрасли экономики необходимо учитывать следующие его специфические особенности. Транспорт – это, прежде всего, сеть экономики, он играет движущую роль, его основная функция – перевозка грузов, пассажиров и информации, основное содержание транспорта тесно связано с перемещением, территорией, расстоянием, временем и перевозками, он одновременно является элементом производственно-экономической и социальной инфраструктуры, и в то же время отражает состояние транспортной сети и системы, уровень экономического развития и освоения региона. Транспорт также является «кровеносным сосудом» экономики любой страны и фактором ее расположения.

Кроме того, ключевую роль играет фактор транспортировки, исходя из того, является ли она дешевой, дорогой, удобной или неудобной. Благоприятное или неблагоприятное экономико-географическое положение определяется на основе транспортной географии. В то же время транспорт является относительно малоизученной областью экономико-географических исследований.

Стоит отметить, что транспорт, как важная отрасль экономики, можно разделить на следующие виды и отрасли. К ним относятся наземный (железнодорожный, автомобильный, трубопроводный), водный (морской и речной) и воздушный транспорт.

Транспорт характеризуется не только региональными, но и сетевыми характеристиками. В частности, преимуществом автомобильного транспорта перед другими является его большая пропускная способность «от двери до двери» при перевозке грузов и пассажиров. Однако железнодорожный транспорт имеет большой потенциал для перевозки больших объемов грузов на большие расстояния. Воздушный транспорт также используется для перевозки грузов и пассажиров на большие расстояния.

Транспорт также выступает одним из основополагающих факторов формирования и развития территориального разделения труда, являющегося основой экономико-географических процессов, а его продуктом — экономических районов и территориально-производственных комплексов. В современных экономико-географических исследованиях актуальное научное и практическое значение имеет оценка транспортно-экономического потенциала стран и регионов, учет транспортного фактора при определении перспектив их развития

Экономико-географические процессы обязательно осуществляются через транспортную систему. Транспортная инфраструктура также лежит в основе развития многих отраслей промышленности, которые развиваются в последнее время. Транспорт также играет важную роль в географических исследованиях. Следовательно, туристическая индустрия, которая в

настоящее время стремительно развивается во всем мире, оказывает влияние и на развитие транспортной инфраструктуры, формирование региональных транспортных сетей.

Говорят, что в экономической географии транспорт изучается в основном с трех точек зрения. Во-первых, как составная часть региональных производственных комплексов; - во-вторых, как фактор транспортно-экономической инфраструктуры, точнее, исходные условия, создаваемые для размещения и развития производительных сил, - в-третьих, как одна из важнейших отраслей «кровеносного сосуда» народного хозяйства [4; с.153.].

Кроме того, транспортная система является одной из основных сил, влияющих на географическое пространство и изменяющих экономический и социальный ландшафт региона. Поэтому при географическом изучении транспорта необходимо изучать природно-географические условия регионов. В то же время природные условия, в свою очередь, также оказывают существенное влияние на развитие транспортных сетей.

При строительстве дорог учитываются такие факторы, как сложный рельеф местности, геоморфология, геология и др. На строительство и эксплуатацию транспортной инфраструктуры большое влияние оказывают климатические факторы, такие как температура, осадки, ветер и оползни. При эксплуатации воздушного транспорта и размещении объектов инфраструктуры, таких как аэропорты, необходимо также учитывать особенности атмосферного воздуха и климата.

Первые крупные научно-теоретические исследования, связанные с географией транспорта, были выполнены в основном немецкими учеными в прошлом веке. Например, Бернштейн-Коган в своей работе «Очерки географии транспорта» приводил слова известного ученого А. Геттнера о том, что география транспорта издавна является наиболее близкой и даже любимой отраслью географии. Он также изучал географию транспорта и высоко ценил работы Блюма и Куля [4; с.153.].

Геттнер считает, что при изучении транспортной географии необходимо знать не только пути сообщения, но и потоки грузов и пассажиров по ним.

Французский император Н. Бонапарт так оценивал транспорт: «О могуществе страны можно судить по уровню развития ее транспортных коммуникаций». Также Уильям Бунге и Питер Хаггетт среди ученых, изучавших влияние транспортных сетей на национальную экономику, ее значение в региональной специализации и развитии населенных пунктов, больше внимания уделяли вопросам транспортных сетей и плотности [9; с.23.].

Одним из первых исследователей в области транспорта был Б. Коган, который в 1930 году опубликовал книгу по географии транспорта. В ней автор подчеркивает, что природные и экономико-географические факторы играют важную роль в развитии регионального транспорта [2].

В 1900–1960-е годы (в период царской России и Советского Союза) теоретические и методологические основы географии транспорта, общие

понятия, грузо- и пассажиропотоки, а также транспортные центры и транспортные узлы разрабатывались С.В. Бернштейн-Коган (1930), Н.Н. Колосовский (1951,1953) Н.Н. Его изучали Баранский (1956, 1962) и другие исследователи. Однако в дальнейшем, в 1960–1990-е годы, рамки экономико-географических исследований транспорта несколько сузились. Но, несмотря на это, в этот период было проведено много исследований. В частности, М.Д. Шарыгин изучал транспортные факторы в экономической географии Урала и Западной Сибири. Работы И.В. Никольский (1978) пролил свет на теоретические и методологические вопросы географии транспорта.

Тархов С.А. изучал эволюционную морфологию транспортных сетей [14; 46–с.], а известный ученый В.Н. Бугроменко изучает удобство транспорта и подчеркивает необходимость изучения его территориальной формы, отмечая этот вопрос как «важнейшую задачу географии транспорта» [3; с.48.].

Бугроменко В.Н. в своей работе «Региональные транспортные системы» также проанализировал удобство транспортного сообщения в регионе и предложил комплексную методику оценки для определения уровня транспортной обеспеченности региона.

Крылов П.М. в 2007 году разделил российские региональные транспортные системы на 4 типа. По его словам, невозможно определить транспортную стратификацию регионов без изучения региональных транспортных систем. Он также говорит, что изучение региональных транспортных систем помогает оценить транспортную географию места [10; с.24.].

Кроме того, Наретин А.С. провел исследование (2018 г.) транспортного положения и возможностей региона, проанализировав европейскую часть России. КАК. Наретин в своих работах изучал взаимосвязь, подвижность и территориальное размещение транспорта через различные транспортные сети [13; 28- с.].

Интересно, что наставником двух вышеупомянутых исследователей был Тархов С.А., один из ведущих ученых, изучавших географические перевозки между странами СНГ. Занимался теоретическими вопросами географии транспорта, развитием транспортной сети регионов, административно-территориальным делением России.

Кроме того, значение высокоскоростных поездов в мировой и российской транспортной системе изучалось такими учеными, как Грудсин Н.А. (2017), а анализ развития транспорта Восточной Сибири с экономико-географической и картографической точки зрения - Дашпилов С.Б. (2013).

Среди американских и европейских учёных большой вклад в развитие географии транспорта внесли Г. Сендлер, Г. Келлер, К. Клаус (Германия), С. Березовский, И. Залесский (Польша), Р. Клозе, А. Вигаре (Франция), Э. Таафе, Э. Ульман (США), А. О. Делл, К. Сили (Великобритания), Г. Александерсон (Швеция) и другие [15].

В нашей республике исследованиями транспорта занимались в основном экономисты. В частности, Ходжаев С.М. подробно изучал

становление и развитие узбекского транспорта, а Менгельдин Д.И. [12;] занимался вопросами размещения и развития узбекской транспортной сети. Набиев Р.В. и Камолов Т.К., Умаров Ю.К. проводил исследования по развитию транспорта в Республике Каракалпакстан, а Олджабоев К. (1999) проводил исследования по реализации реформ железнодорожного транспорта в Узбекистане. В своей книге «Единая транспортная система» Ходжаев Б.А. освещал состояние транспортной системы Узбекистана в 1980-х годах.

Также в последние годы Усманов З.К. в 2020 году защитил диссертацию на тему «Территориальная организация транспортной системы Узбекистана и ее совершенствование». В ней рассматриваются территориальная организация транспортной системы нашей страны, факторы, влияющие на ее развитие, интегральные категории оценки обеспеченности регионов дорожно-транспортной инфраструктурой. В то же время районирование территории Республики Узбекистан по движению транспортных средств было проведено А.Х.Уроковым (2009-2020 гг.) [16;]. В нашей республике первые транспортно-географические научные исследования (2009-2024 гг.) были проведены Исаев А.А. об Узбекистане и некоторых его регионах (транспорт Ферганской долины).

Однако комплексных географических исследований в региональном масштабе, направленных на повышение геоэкономического потенциала нашей страны, в частности, на дальнейшее развитие ее внешних связей, удобных (максимально близких) выходов на мировые торгово-экономические системы (морские порты), а также на одновременное совершенствование транспортной инфраструктуры как с экономической, так и с инфраструктурной точки зрения, не проводилось.

И.В. Никольский, изучая географию транспорта во взаимосвязи с производительными силами региона, утверждает, что при географическом изучении транспорта необходимо анализировать не только экономико-географические аспекты, но и природные условия региона [6; 12-й с.].

По нашему мнению, наука география транспорта изучает особенности формирования транспортных систем или сетей в различных регионах и основные факторы их развития, а также закономерности формирования и развития региональных транспортных систем (РТС) или узлов. Это позволит выявить особенности транспортно-географического потенциала регионов и их региональные различия, сосредоточиться на рациональном размещении и развитии транспортных сетей с учетом связей между ними, совершенствовании существующей транспортной инфраструктуры. В то же время изучение влияния транспорта на размещение и развитие промышленных предприятий в изучаемом регионе позволяет обнаружить новые закономерности в экономической географии.

Как правило, районы с хорошо развитой транспортной сетью также имеют высокую демографическую емкость, а плотность населения уменьшается по мере удаления от основных транспортных путей. Такие закономерности можно выявить, изучая распределение населения. Следует

отметить, что уровень покрытия регионов транспортной сетью измеряется по отношению к численности населения и площади региона.

Сегодня конкуренция возникла между тремя видами транспорта: наземным (автомобильным, железнодорожным, трубопроводным), морским и воздушным. Транспортная система по своему техническому уровню и масштабу адаптировалась к потребностям населения.

К XXI веку современный транспорт должен был соответствовать определенным требованиям. Например, все большее значение приобретают такие факторы, как надежность, безопасность, точность «сроков доставки» в любой точке транспортной сети, поддержание стандарта поставок.

В то же время нельзя отрицать роль транспортного фактора в «удобном» или «неудобном» географическом положении, в «дешевой» или «дорогой» стоимости товара или услуги [92; стр. 84–88]. Отсюда видно, что транспорт является не только фактором, но и связующим звеном, неотъемлемой частью процесса воспроизводства. Это еще больше увеличивает его социальную значимость.

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ЭКОНОМИЧЕСКОЕ СОДЕРЖАНИЕ ПОНЯТИЯ «ИНВЕСТИЦИОННАЯ ПРИВЛЕКАТЕЛЬНОСТЬ РЕГИОНА» СУЩНОСТЬ И ФАКТОРЫ РАЗВИТИЯ

Аннотация*: В статье анализируются теоретико-методологические основы концепции инвестиционной привлекательности региона. Систематизированы факторы, определяющие инвестиционную привлекательность, проведено сравнение международных и отечественных научных взглядов. В статье обосновывается роль инвестиционных факторов в обеспечении регионального экономического и социального развития и необходимость их оценки. Также подчеркивается необходимость разработки усовершенствованных методических подходов к анализу инвестиционной привлекательности регионов Узбекистана.*

Ключевые слова*: Инвестиционная привлекательность, региональное развитие, социально-экономические факторы, инфраструктура, инвестиционный климат, методология оценки, конкурентоспособность, региональная стратегия.*

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ECONOMIC CONTENT OF THE CONCEPT OF "INVESTMENT ATTRACTIVENESS OF A REGION", ESSENCE AND DEVELOPMENT FACTORS

Abstract: *The article analyzes the theoretical and methodological foundations of the concept of investment attractiveness of a region. The factors determining investment attractiveness are systematized, and international and*

domestic scientific views are compared. The article substantiates the role of investment factors in ensuring regional economic and social development and the need to assess them. It also emphasizes the need to develop improved methodological approaches to analyzing the investment attractiveness of regions of Uzbekistan.

Keywords: *Investment attractiveness, regional development, socio-economic factors, infrastructure, investment climate, assessment methodology, competitiveness, regional strategy.*

Понятие инвестиционной привлекательности регионов - сложная и многогранная категория, сформированная на стыке экономической и социальной географии, региональной экономики и наук стратегического управления. Данная концепция в основном воплощает в себе стимулы, возможности и существующие условия региона для инвестиций с точки зрения иностранных и отечественных инвесторов. В научной литературе данная категория объясняется различными подходами. В частности, М. Портер (1990) считает инвестиционную привлекательность ключевым элементом модели конкурентоспособности. По его мнению, уровень привлекательности любого региона или страны формируется на основе четырех факторов - факторов производства, условий спроса, развития смежных и вспомогательных отраслей, а также стратегии и уровня конкуренции фирм.

Староверова Е.Н. рассматривает инвестиционную привлекательность как «комплексную характеристику предприятия - объекта инвестирования, отражающую конкурентный потенциал, инвестиционную и социальную эффективность, с учетом изменения регионального и странового инвестиционного климата» [11, с.10].

В некоторых определениях больше внимания уделяется предприятию, привлекающему инвестиции, и перспективам его развития. Так, Лаврухина Н.В. высказывает мнение, что «инвестиционная привлекательность предприятия – это, прежде всего, его возможность вызвать коммерческий или иной интерес у реального инвестора, включая способность самого предприятия «принять инвестиции» с целью получения реального экономического эффекта – роста рыночной стоимости предприятия» [9]. По мнению Н.А Зайцевой «инвестиционная привлекательность характеризуется состоянием объекта, его дальнейшего развития, перспектив доходности и роста» [8]. В определении, данном Смирновой Н.В., «инвестиционная привлекательность - это оценка объективных возможностей состояния объекта и направлений инвестирования, формируемая при подготовке принятия решения инвестором». [13, с. 10]. Однако системное взаимодействие предприятия, привлекающего инвестиции, с потенциальными инвесторами в этих определениях не прослеживается.

В докладах **UNCTAD (2023)** и Всемирного банка (2022) инвестиционная привлекательность оценивается с использованием более

прагматичного подхода. При таком подходе главное место занимают уровень экономической свободы, правовая стабильность, квалификация рабочей силы, налоговые и таможенные льготы, развитость инфраструктуры.

Узбекский ученый Х.С. Собиров (2021) анализирует инвестиционную привлекательность с точки зрения обеспеченности региона экономическими ресурсами, производственной и сервисной инфраструктурой, стратегическим расположением, а также механизмами защиты инвестиций. Н. Каримова (2023) обогащает эту концепцию социальными, экологическими и инновационными факторами, которые служат привлечению инвестиций.

Сущность инвестиционной привлекательности:

Объективная составляющая: Инвестиционный потенциал региона определяется наличием и качеством его ресурсов (природных, трудовых, финансовых), уровнем развития инфраструктуры, транспортной сети, качеством социальной сферы. Инвестиционный риск – это вероятность потери инвестиций или недополучения дохода, связанная с различными факторами, как экономическими, так и политическими.

Субъективная составляющая: Инвестиционный климат - это совокупность политических, экономических и социальных условий, которые влияют на принятие решений инвесторами. Он характеризуется стабильностью политической ситуации, прозрачностью законодательства, эффективностью правоохранительных органов, уровнем коррупции, а также наличием мер поддержки инвесторов.

Инвестиционная активность: Это уровень участия инвесторов в экономике региона, включая как национальных, так и иностранных. Он отражает, насколько региона интересен для вложения средств, насколько эффективно он использует инвестиционные возможности

Факторы формирования инвестиционной привлекательности:

•На основе аналитической литературы факторы, формирующие инвестиционную привлекательность, можно разделить на следующие группы:

•Экономические факторы: размер и структура ВВП, темпы экономического роста, уровень инфляции, стабильность валюты, развитие кредитно-финансовой системы.

•Факторы инфраструктуры и логистики: покрытие автомобильными дорогами, железными дорогами, электрическими сетями, интернетом и системами связи.

• Институционально-правовые факторы: гарантии защиты инвестиций, борьба с коррупцией, независимость судебной системы, цифровизация государственных услуг.

•Демографические и социальные факторы: рынок труда, демографический состав, качество образования, социальная стабильность.

•Экологические и инновационные факторы: потенциал зеленой энергии, возможности экологически чистого производства, количество научно-исследовательских институтов.

При определении инвестиционной привлекательности региона эти факторы следует анализировать не по отдельности, а комплексно и системно. Для этого необходимо использование многофакторных статистических моделей, индексов и рейтинговых систем.

Эволюция научных взглядов и концептуальных дебатов: Имеются также концептуальные различия в формировании понятия инвестиционной привлекательности. С одной стороны, эта концепция представляет собой ресурсный подход, то есть она оценивается на основе имеющихся ресурсов и возможностей. Во втором направлении - поведенческий подход, то есть он учитывает психологические и стратегические факторы при принятии решений инвесторами.

В связи с этим в научном сообществе до сих пор не существует единой универсальной модели инвестиционной привлекательности. Такая ситуация, в свою очередь, обусловливает необходимость разработки уникальной комплексной методологии оценки в каждом регионе.

«Инвестиционная привлекательность территории» (ИПТ) - многогранное понятие, отражающее уровень экономической, правовой, институциональной и социальной инвестиционности определенного географического пространства для отечественных и иностранных инвесторов. Это понятие связано не только с наличием ресурсов, но и с условиями их эффективного использования, развитием инфраструктуры, качеством трудовых ресурсов, политической стабильностью, экологической безопасностью и предсказуемостью экономической среды.

Инвестиционная привлекательность включает в себя не только текущие возможности, но и долгосрочную окупаемость инвестиций, уровень риска и потенциальную прибыльность. Поэтому при оценке данной категории наряду с классическими показателями (например, ВВП, уровень инфраструктуры, качество рабочей силы) учитываются и относительно неопределенные факторы (политическая обстановка, инновационный потенциал, состояние окружающей среды).

Повышение инвестиционной привлекательности региона - это не только привлечение новых проектов, но и модернизация существующей инфраструктуры, упрощение нормативно-правовой базы, создание инфраструктурных кластеров и свободных экономических зон, соответствующих международным стандартам.

Развитие происходит по следующим основным направлениям:

• Институциональное развитие: способность местных органов власти работать с инвесторами, устранение коррупционных барьеров.

• Создание инновационной среды: создание технопарков, стартап-инкубаторов и исследовательских центров.

•Развитие транспортно-логистической системы: уровень связанности региона с другими рынками.

• Качество жизни: экологическое равновесие, уровень социальных услуг, безопасность.

Развитие инвестиционной привлекательности региона - не статичный, а динамичный процесс, который улучшается с течением времени на основе экономического, социального, институционального и экологического потенциала региона. Это развитие по сути выражается в двух основных направлениях: количественном росте и качественном улучшении.

Количественный рост определяется такими показателями, как увеличение объема привлеченных в регион инвестиций, количества новых инвестиционных проектов, общей стоимости произведенной продукции. Такие показатели обычно берутся в качестве объекта статистического анализа, а их изменение свидетельствует об этапе экономического развития региона. Например, в Кашкадарьинской области рост иностранных инвестиций в последние годы не только создал новые рабочие места, но и стимулировал диверсификацию отраслей промышленности.

Качественное развитие проявляется в таких факторах, как улучшение инвестиционной среды, эффективное управление, снижение коррупционных барьеров, упрощение процедур для инвесторов, повышение правовой защиты и стабильности. Этот аспект обеспечивает долгосрочную привлекательность района.

Качественное развитие инвестиционной привлекательности региона отражается в следующем:

•Институциональные реформы: повысится качество местного управления в работе с инвесторами;

•Увеличение человеческого капитала: формирование квалифицированной рабочей силы и деловой среды;

• Инновационная среда: будет развиваться деятельность стартапов, технопарков, научных центров;

• Сетевые кластеры: интегрированы отрасли производства, логистики и услуг.

Развитие инвестиционной привлекательности региона включает несколько этапов:

Описание	Этапа
Начальная стадия	Инфраструктура и институциональная среда недостаточны, инвесторы приходят медленно.
Стадия активации	Государство создает стимулы, правила и благоприятную среду.
Устойчивое развитие	Регион зарекомендовал себя, имея постоянный поток инвесторов.
Интеграция инноваций	Высокие технологии, кластеризация и повышение конкурентного потенциала.

Инвестиционная привлекательность региона - это не только экономическая категория, но и комплексный показатель, выражающий уровень устойчивого развития региона, эффективности использования

ресурсов и гибкости в мировых рыночных отношениях. Глубокое изучение теоретических основ данной концепции показывает, что формирование инвестиционной привлекательности тесно связано со многими факторами, среди которых географическое положение, запасы природных ресурсов, производственная инфраструктура, качество трудовых ресурсов, развитость финансовой системы, эффективность институтов управления.

Таким образом, для повышения инвестиционной привлекательности региона недостаточно только развития инфраструктуры, важно комплексно анализировать и внедрять такие факторы, как институциональные реформы, инвестиции в человеческий капитал, создание открытой и конкурентной рыночной среды. Это способствует социально-экономической стабильности регионов и способствует обеспечению территориального равенства в экономике страны.

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ТРАДИЦИОНАЛИЗМ И ГЕНДЕРНАЯ ИДЕНТИЧНОСТЬ В НАЦИОНАЛЬНЫХ ПРОЗАХ: СРАВНИТЕЛЬНЫЙ АНАЛИЗ РУССКОЙ И УЗБЕКСКОЙ ЛИТЕРАТУРНЫХ ТРАДИЦИЙ

Аннотация: *Феномен традиционализма в литературном процессе представляет собой сложную систему, в которой национально-культурные и гендерные факторы оказываются неотъемлемыми элементами художественного моделирования действительности. Русская и узбекская литературные традиции формировались в условиях различной историко-культурной динамики, что обусловило как сходства, так и глубокие различия в репрезентации традиционных ценностей и гендерных идентичностей. В статье предпринята попытка сравнительного анализа этих двух направлений через призму традиционализма, понятийного кода, в котором закреплены устойчивые жанрово-тематические и стилистические элементы. Особое внимание уделяется вопросам взаимодействия фольклорной, религиозной и философской составляющей с механизмами формирования женских и мужских образов. Исследование выявляет, что традиционализм в обеих литературных культурах выступает не как архаичный рудимент, а как активная форма адаптации культурной памяти к условиям глобализированного мира. Гендерные модели в данном контексте приобретают функцию не только отражения, но и конструирования социальных ролей, что позволяет рассматривать литературный текст в качестве инструмента культурной трансляции. В русской литературе, как и в узбекской, традиционализм выполняет роль медиатора между исторической памятью и современным мировоззрением, обеспечивая преемственность духовных смыслов и национальной самобытности. Предложенный сравнительно-сопоставительный анализ демонстрирует, что именно в традиционалистских структурах художественного текста наиболее ярко проявляется напряжение между коллективной культурной идентичностью и индивидуальными проявлениями гендерной субъектности.*

Ключевые слова: *Традиционализм, гендерная идентичность, русская литература, узбекская литература, культурная трансляция, национальные коды, фольклор, философия, женские и мужские образы, сопоставительный анализ.*

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TRADITIONALISM AND GENDER IDENTITY IN NATIONAL PROSE: A COMPARATIVE ANALYSIS OF RUSSIAN AND UZBEK LITERARY TRADITIONS

Abstract: *The phenomenon of traditionalism in the literary process represents a complex system in which national-cultural and gender factors serve as integral components of artistic modeling of reality. Russian and Uzbek literary traditions have developed under differing historical and cultural dynamics, which have resulted in both similarities and profound differences in the representation of traditional values and gender identities. This article attempts a comparative analysis of these two literary directions through the prism of traditionalism as a conceptual code embedding stable genre-thematic and stylistic elements. Particular attention is given to the interaction between folklore, religious, and philosophical aspects and the mechanisms of shaping male and female images. The study reveals that traditionalism in both literary cultures functions not as an archaic remnant, but as an active form of adapting cultural memory to the conditions of a globalized world. In this context, gender models perform the function not only of reflection but also of constructing social roles, allowing literary texts to be viewed as instruments of cultural transmission. In both Russian and Uzbek literature, traditionalism acts as a mediator between historical memory and contemporary worldviews, ensuring the continuity of spiritual meanings and national identity. The proposed comparative analysis demonstrates that it is within the traditionalist structures of artistic texts that the tension between collective cultural identity and individual expressions of gender subjectivity is most vividly manifested.*

Keywords: *traditionalism, gender identity, Russian literature, Uzbek literature, cultural transmission, national codes, folklore, philosophy, male and female imagery, comparative analysis.*

Актуальность: Современное гуманитарное знание все более настойчиво обращается к проблемам идентичности — как национальной, так и гендерной. Литература, являясь пространством культурной памяти и символической репрезентации социальных ролей, оказывается ключевым источником для осмысления процессов, происходящих на пересечении традиции и трансформации. Особенно значимо это для литературных традиций, сформированных в условиях прочной связи с религиозными, философскими и фольклорными основаниями — как это характерно для русской и узбекской прозы. Традиционализм, как устойчивое ядро литературного дискурса, становится своеобразным механизмом хранения культурного архива, где закреплены не только сюжеты и образы прошлого, но и модели поведения,

моральные категории, представления о должном и допустимом. Актуальность темы настоящего исследования определяется необходимостью осмысления того, как в этих традиционалистских структурах формируются, закрепляются и интерпретируются гендерные роли, какие механизмы используются для трансляции нормативных моделей женственности и мужественности, и как эти модели меняются под влиянием исторических, политических и культурных сдвигов.

Для современного этапа особенно важным становится сравнительно-сопоставительный подход, поскольку он позволяет увидеть, каким образом различные национальные литературные системы формируют свои уникальные модели гендерной идентичности, и в то же время какие универсальные механизмы действуют в этих процессах. Изучение традиционализма в контексте русской и узбекской прозы дает возможность не только выявить особенности каждой из литературных культур, но и определить общие закономерности функционирования традиции в условиях глобализации. В ситуации, когда границы культур все более размываются, возвращение к корневым, традиционным моделям приобретает значение не консервативного жеста, а акта культурного сопротивления и самосохранения. Именно в этом контексте исследование традиционализма и гендерной идентичности в литературе становится не только научной задачей, но и культурной миссией.

С позиции междисциплинарности наблюдается возрастающий интерес к пересечению литературоведения и гендерных исследований, в рамках которого художественный текст рассматривается как поле репрезентации и конструирования социальных ролей. Однако в отечественном и зарубежном литературоведении сравнительный анализ традиционалистских структур русской и узбекской прозы в контексте гендерного дискурса до сих пор остается фрагментарным. Отдельные аспекты освещаются в трудах социологов, культурологов, философов, но системного литературоведческого подхода, учитывающего национально-культурную специфику и глубинную поэтику жанровых форм, пока недостаточно. Таким образом, предпринятая попытка комплексного анализа взаимодействия традиционализма и гендерных моделей в двух национальных литературах отвечает актуальным задачам развития гуманитарного знания, ориентированного на глубокое понимание механизмов культурной преемственности и трансформации идентичности в художественном тексте.

Материалы и методы: Исследование базируется на анализе произведений русской и узбекской прозы, в которых наиболее отчетливо проявляются традиционалистские черты и формируется национально-гендерный дискурс. В качестве основного корпуса рассматриваются художественные тексты, отражающие различные этапы развития литературных традиций обеих культур. В русской литературе внимание сосредоточено на произведениях Л.Н. Толстого, Ф.М. Достоевского, А.И. Солженицына, В.Г. Распутина и Е.Г. Водолазкина. Эти авторы различны по

своей художественной манере, однако их объединяет ориентация на духовную проблематику, внимание к исторической памяти и обращение к образу женщины и мужчины как носителей культурных архетипов. В узбекской прозе исследование охватывает творчество Айбека, Гафура Гуляма, Абдуллы Каххара, Эркина Азама и Мамадали Махмудова, где традиционные ценности и гендерные роли формируют устойчивую сюжетную и образную структуру.

Анализ художественного материала осуществлялся с опорой на методы, сочетающие как классические литературоведческие, так и современные гуманитарные подходы. Ключевым является метод сравнительно-сопоставительного анализа, позволяющий выявить как общие принципы функционирования традиционализма, так и уникальные национальные черты. Такой подход необходим в условиях параллельного рассмотрения русской и узбекской прозы, поскольку он обеспечивает корректную интерпретацию культурно обусловленных смыслов и символов. В рамках данного метода исследование фокусируется не на формальном сопоставлении тем и мотивов, а на более глубоком анализе поэтических стратегий, репрезентирующих гендерные роли через призму культурной традиции.

Важную роль играет культурологический подход, который позволяет рассматривать литературные тексты как форму выражения коллективного сознания, отражающего систему ценностей и идеологических установок эпохи. Через этот подход исследование обнаруживает скрытые культурные коды, формирующие национально-гендерные модели. Гендерный анализ применяется как способ выявления стратегий репрезентации женских и мужских образов, включая их поведенческие, психологические и символические характеристики. В таком контексте гендерные модели интерпретируются не как биологически детерминированные роли, а как культурные конструкции, закрепленные в литературной традиции.

Для углубления анализа используется также структурно-семиотический метод, позволяющий расшифровать знаковую систему текста, выявить устойчивые мифологемы, символы и архетипы, отражающие традиционалистскую парадигму. Интертекстуальный подход служит для определения тех культурных и литературных аллюзий, которые создают эффект диалога между различными эпохами и художественными стилями. Таким образом, исследование основывается на комплексной методологии, в которой синтезируются литературоведческие, культурологические и гендерные инструменты анализа, обеспечивая целостное восприятие традиционализма как культурно-литературного феномена в контексте формирования гендерной идентичности.

Результаты исследования: Проведенное исследование позволило выявить, что традиционализм в русской и узбекской прозе выполняет многослойную функцию, связывая художественные формы с исторической памятью, религиозным сознанием и гендерными установками. Одним из ключевых наблюдений стало то, что в обеих литературных традициях

традиционализм не ограничивается сохранением архаичных жанров и форм, но активно участвует в моделировании новых идентичностей, адаптируя национальные культурные коды к социокультурным изменениям. Через анализ произведений классической и современной прозы удалось установить, что устойчивость традиционалистских структур обеспечивается за счет глубокой связи с национально-гендерным дискурсом, в котором закреплены определенные представления о женственности и мужественности.

В русской литературе традиционализм формирует целостную концепцию национального мира, в котором гендерные роли определяются через идеалы духовности, нравственного служения и общественного долга. Женские образы в произведениях Ф.М. Достоевского, Л.Н. Толстого и А.И. Солженицына символизируют не только материнство и жертвенность, но и внутреннюю стойкость, религиозную чистоту, способность к нравственному подвигу. Мужские персонажи в этих текстах выступают носителями экзистенциального поиска, сомнений, философской рефлексии, что придает их образам трагическую сложность. Таким образом, гендерные конструкции в русской традиционалистской прозе неразрывно связаны с национальной духовной миссией, отсылающей к христианской традиции и моральной философии.

Узбекская проза, напротив, строит свою традиционалистскую модель на фундаменте восточной этики, коллективизма и исламских представлений о социальной гармонии. Женские образы здесь воплощают устойчивость семейного уклада, мудрость, скромность и преданность, а мужские персонажи олицетворяют честь, достоинство и общественную ответственность. В произведениях Айбека, Гафура Гуляма и Абдуллы Каххара прослеживается тенденция к сохранению архаичных форм, в которых гендерные роли подчинены патриархальному порядку. Вместе с тем, в современной прозе Эркина Азама и Мамадали Махмудова наблюдается смещение акцентов: образы женщин становятся более самостоятельными, а мужские персонажи теряют свою однозначность, обретая черты внутреннего сомнения и поиска смысла в меняющемся мире. Это свидетельствует о процессе трансформации традиционных моделей под влиянием социальной модернизации и глобального культурного давления.

Особый интерес представляет то, каким образом в обеих литературных традициях осуществляется сопряжение фольклорного наследия с современными формами повествования. В русской прозе традиционализм опирается на сказовые структуры, житийную литературу и символику православия, встраивая их в реалистическое или философское повествование. Это позволяет не только сохранять духовные архетипы, но и придавать им современное звучание. У Е. Водолазкина, например, библейские и хронографические мотивы сочетаются с постмодернистским осмыслением истории и культуры. В узбекской литературе функция фольклора осуществляется через дастаны, легенды, поэтические метафоры и ритмическую структуру речи, которые интегрируются в повествование даже

в урбанистических сюжетах, создавая эффект глубинной культурной преемственности. Через такие элементы традиционализм сохраняет легитимность в литературном процессе и становится неотъемлемой частью художественного мышления.

Результаты анализа также показали, что традиционализм, несмотря на свою устойчивость, является динамической категорией, способной к внутренней рефлексии. В постсоветской русской литературе образы мужчин и женщин все чаще лишаются прежней идеализации. Женщина перестает быть исключительно хранительницей очага, мужчина — непререкаемым носителем истины. Такие трансформации заметны в произведениях Захара Прилепина и Алексея Варламова, где герои оказываются в ситуации нравственного кризиса, утраты ориентиров, но при этом пытаются опереться на традиционные ценности. В современной узбекской прозе аналогичные процессы выражаются в стремлении пересмотреть гендерные роли в контексте городской модернизации, миграции, экономической нестабильности. Это приводит к тому, что традиционализм в узбекской литературе начинает не только защищать прошлое, но и приспосабливаться к новым условиям, открывая пространство для диалога между поколениями и культурами.

Сравнительный анализ выявил также различия в механизмах гендерной репрезентации. В русской традиции преобладает экзистенциально-философская модель, в которой гендерные роли связаны с нравственным выбором и метафизическими поисками. В узбекской — превалирует социально-этическая модель, подчеркивающая согласие личности с коллективными нормами и религиозным порядком. Тем не менее, в обеих культурах наблюдается стремление сохранить идентичность через обращение к традиционным сюжетам, символам и жанровым формам, что придает литературе статус посредника между прошлым и настоящим.

Результаты исследования: Проведенное исследование позволило выявить, что традиционализм в русской и узбекской прозе выполняет многослойную функцию, связывая художественные формы с исторической памятью, религиозным сознанием и гендерными установками. Одним из ключевых наблюдений стало то, что в обеих литературных традициях традиционализм не ограничивается сохранением архаичных жанров и форм, но активно участвует в моделировании новых идентичностей, адаптируя национальные культурные коды к социокультурным изменениям. Через анализ произведений классической и современной прозы удалось установить, что устойчивость традиционалистских структур обеспечивается за счет глубокой связи с национально-гендерным дискурсом, в котором закреплены определенные представления о женственности и мужественности.

В русской литературе традиционализм формирует целостную концепцию национального мира, в котором гендерные роли определяются через идеалы духовности, нравственного служения и общественного долга. Женские образы в произведениях Ф.М. Достоевского, Л.Н. Толстого и А.И.

Солженицына символизируют не только материнство и жертвенность, но и внутреннюю стойкость, религиозную чистоту, способность к нравственному подвигу. Мужские персонажи в этих текстах выступают носителями экзистенциального поиска, сомнений, философской рефлексии, что придает их образам трагическую сложность. Таким образом, гендерные конструкции в русской традиционалистской прозе неразрывно связаны с национальной духовной миссией, отсылающей к христианской традиции и моральной философии.

Узбекская проза, напротив, строит свою традиционалистскую модель на фундаменте восточной этики, коллективизма и исламских представлений о социальной гармонии. Женские образы здесь воплощают устойчивость семейного уклада, мудрость, скромность и преданность, а мужские персонажи олицетворяют честь, достоинство и общественную ответственность. В произведениях Айбека, Гафура Гуляма и Абдуллы Каххара прослеживается тенденция к сохранению архаичных форм, в которых гендерные роли подчинены патриархальному порядку. Вместе с тем, в современной прозе Эркина Азама и Мамадали Махмудова наблюдается смещение акцентов: образы женщин становятся более самостоятельными, а мужские персонажи теряют свою однозначность, обретая черты внутреннего сомнения и поиска смысла в меняющемся мире. Это свидетельствует о процессе трансформации традиционных моделей под влиянием социальной модернизации и глобального культурного давления.

Особый интерес представляет то, каким образом в обеих литературных традициях осуществляется сопряжение фольклорного наследия с современными формами повествования. В русской прозе традиционализм опирается на сказовые структуры, житийную литературу и символику православия, встраивая их в реалистическое или философское повествование. Это позволяет не только сохранять духовные архетипы, но и придавать им современное звучание. У Е. Водолазкина, например, библейские и хронографические мотивы сочетаются с постмодернистским осмыслением истории и культуры. В узбекской литературе функция фольклора осуществляется через дастаны, легенды, поэтические метафоры и ритмическую структуру речи, которые интегрируются в повествование даже в урбанистических сюжетах, создавая эффект глубинной культурной преемственности. Через такие элементы традиционализм сохраняет легитимность в литературном процессе и становится неотъемлемой частью художественного мышления.

Результаты анализа также показали, что традиционализм, несмотря на свою устойчивость, является динамической категорией, способной к внутренней рефлексии. В постсоветской русской литературе образы мужчин и женщин все чаще лишаются прежней идеализации. Женщина перестает быть исключительно хранительницей очага, мужчина — непререкаемым носителем истины. Такие трансформации заметны в произведениях Захара Прилепина и Алексея Варламова, где герои оказываются в ситуации

нравственного кризиса, утраты ориентиров, но при этом пытаются опереться на традиционные ценности. В современной узбекской прозе аналогичные процессы выражаются в стремлении пересмотреть гендерные роли в контексте городской модернизации, миграции, экономической нестабильности. Это приводит к тому, что традиционализм в узбекской литературе начинает не только защищать прошлое, но и приспосабливаться к новым условиям, открывая пространство для диалога между поколениями и культурами.

Сравнительный анализ выявил также различия в механизмах гендерной репрезентации. В русской традиции преобладает экзистенциально-философская модель, в которой гендерные роли связаны с нравственным выбором и метафизическими поисками. В узбекской — превалирует социально-этическая модель, подчеркивающая согласие личности с коллективными нормами и религиозным порядком. Тем не менее, в обеих культурах наблюдается стремление сохранить идентичность через обращение к традиционным сюжетам, символам и жанровым формам, что придает литературе статус посредника между прошлым и настоящим.

Выводы: Проведенное исследование позволило установить, что традиционализм в русской и узбекской литературе функционирует не как архаичная или изолированная система, а как активный механизм, обеспечивающий культурную преемственность и устойчивость национальных идентичностей в условиях глобализации. Он объединяет в себе жанровые и стилистические элементы, коренящиеся в фольклоре, религиозных традициях и философских представлениях, и при этом адаптируется к изменяющимся социальным и культурным реалиям. В контексте литературного процесса традиционализм проявляется как форма исторической и культурной памяти, актуализирующая представления о должном, идеальном и подлинном, в том числе в аспекте гендерной репрезентации.

Гендерные модели, зафиксированные в русской и узбекской традиционалистской прозе, представляют собой устойчивые конструкты, формирующие представления о женственности и мужественности, которые, несмотря на внешнюю стабильность, демонстрируют внутреннюю подвижность. Женские и мужские образы в обоих национальных контекстах не только отражают, но и формируют культурные нормы, влияя на общественное сознание и трансляцию социального опыта. Русская литература акцентирует философско-экзистенциальную глубину гендерных ролей, делая женщину нравственным ориентиром, а мужчину носителем духовного поиска. Узбекская проза, в свою очередь, воплощает традиционные представления о социальной гармонии, придавая гендерным образам функцию стабилизации общественного и семейного порядка.

В процессе сравнительно-сопоставительного анализа выявлено, что в обеих культурах традиционализм формирует особое культурное пространство, в котором художественный текст выполняет не только

эстетическую, но и социокультурную функцию. Он структурирует память народа, вплетая личные истории героев в коллективную судьбу нации, и в то же время формирует новые модели идентичности, отвечающие вызовам современности. Именно эта двойственность — способность сохранять и одновременно переосмысливать — делает традиционализм одним из ключевых компонентов национальной литературы и важнейшим объектом научного анализа.

Традиционализм в русской и узбекской литературе выступает как текстуализированная форма культурного диалога между прошлым и настоящим, в которой гендерные роли становятся не просто отражением социальной структуры, но способом осмысления базовых ценностей. Установленные в ходе исследования закономерности позволяют утверждать, что традиционализм сохраняет актуальность и в современном литературном дискурсе, выступая как универсальный способ выражения национальной специфики через художественные формы. Его изучение способствует углублению понимания культурной самобытности, расширению методологических подходов в литературоведении и открывает новые перспективы для осмысления гендерной проблематики в национальном контексте.

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ЭЛЕКТР ЭНЕРГИЯДА ИСРОФИНИ АНИҚЛАШ УСУЛЛАРДА ЭНЕРГИЯ АУДТ УТКАЗШ

Аннотация:*Электр энергиясини узатиш ва тақсимлашда электр тармоқлари алоҳида ўринни эгаллайди. Ишлаб чиқарилаётган электр энергиясини деярли ҳаммаси электр тармоқлари бўйлаб келади. Электр тармоғини асосий вазифаси истеъмолчиларни электр билан таъминлаш, яъни электр энергияси ишлаб чиқадиган жойдан уни ишлатиладиган жойга узатишдан иборат.[1].*

Калит сўзлар: *электр энергия, токлар, қувват исрофи ошмаслик, бошқариш, кучланиш tushunchalar biriktirilgan.*

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METHODS FOR DETERMINING ELECTRICAL ENERGY WASTE CONDUCTING ENERGY AUDIT

Abstract*::Electric networks occupy a special place in the transmission and distribution of electric energy. Almost all of the generated electricity comes through power grids. The main task of the electric network is to supply consumers with electricity, that is, to transfer it from the place where electricity is generated to the place where it is used [1].*

Key words: electricity, current, power dissipation, control, voltage.

Электр энергия исрофини ҳисоблаш учун 0,4 кВ кучланишгача бўлган тармоқни тасдиқланган принципиал электр схемасидан фойдаланилади [2]. Нормал шу режимдаги ҳар бир таъминлаш маркази кўрсатилган таксимлаш пунктлари, реакторлар тури, марка, кесим юзаси ва узунлик кўрсатилган кабел ва ҳаво линиялари тармоқ ва абонент трансформатор нимстанциялари. Трансформатор нимстанциясида ячейка номери, куч трансформаторларининг маълумотлари коммутатция аппаратларини кўрсатилган бўлиши лозим. Таъминлаш марказида ва тақсимлаш пунктларида секцияни номерини тақсимлаш ва таъминлаш линиясини номини, ушбу секцияларда тарқалувчилари кўрсатилиш керак [3].

10(6) 0,4 кВ кучланишли куч трансформаторлардаги электр энергия исрофларини аниқлаш.

Куч трансформаторларидаги электр энергия исрофларини ҳисоблаш учун бошланғич маълумотлар [4]:

Трансформатор тури, қуввати, номинал ток, салт ишлаш ва қисқа туташув исрофлари (паспорт маълумотлар асосида) ҳисоблаш давридаги трансформаторларни ўчирилиш маълумотномаси;

Назорат ўлчаш давридаги кунлик юклама графигидан олинган трансформаторни ўртача максимал ишчи токи

$$I_{ўр} = \frac{I_a + I_b + I_c}{3}; \text{ А} \quad (1)$$

Куч трансформаторларидаги актив энергия сони $W_{Т8}$ хисоблаш давридаги абонент трансформаторларга келувчи актив энергия сони $W_{Тр}$ (кВт.С)

Куч трансформаторлардаги йиллик электр энергия исрофини аниқланади.

$$W_{mpi} = \Delta P_{c.ui} t + \Delta P_{к.mi} \tau K_3^2; \text{ кВт.с} \quad (2)$$

бу ерда t- ҳисоблаш давридаги трансформатор иш соат сони;

τ - максимал исрофлар вакти [5].

$P_{c.u.i} t, P_{к.т.i}$ – салт ишлаш ва киска туташувни қувват исрофи. кВт

$K_З$–йиллик максимал даврдаги трансформаторни юкланиш коэффициенти.

$$K_э = \frac{I_{ўр.мак}}{I_{ні}} \quad (3)$$

бу ерда I_{ni} i - та трансформаторни номинал ток,

$I_{ўрт.макс}$- назорат ўлчаш давридаги кунлик графикдан олинган ўртача максимал ток

Келтирилган τ қийматини қуйидагилар ёрдамида топамиз.

$$\tau = \left(0{,}124 + \frac{T}{10^4}\right)^2 \cdot 8760, c \quad (4)$$

бу ерда Т- максимал юкланишни фойдаланиш соат сони.

Максимал юкланишдаги фойдаланган соатлар сонини қуйидаги формула ёрдамида топилади.

$$\tau = \frac{W_{тр}}{\sqrt{3} \cdot U_{тр.н.} \sum_{i=1}^{n} I_{ўр.макс}}, \text{ с} \quad (5)$$

бу ерда $U_{тр.н}$ трансформаторни паст томонидаги номинал линия кучланиши. τ ва Т қийматларига асосан $\tau = f(T)$ боғлиқлик графигини қуриш мумкин.

Ҳамма трансформаторлардан йиллик электр энергия исрофини қуйидаги формула ёрдамида топилади [6].

$$\Delta W_{тр} = \sum_{i=1}^{n} \Delta W_{тр.i} \text{ кВт} \quad (6)$$

бу ерда n- электр тармокдаги трансформатор сони

Куч трансформаторларидаги электр энергия исрофини нисбий киймати

$$\Delta W_{тр}\,\% = \frac{\Delta W_{тр} \cdot 100\%}{W_{тр}} \quad (7)$$

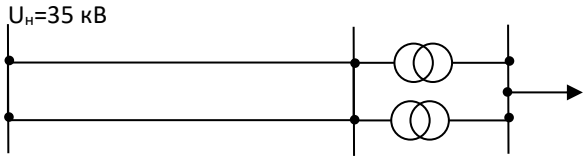
бу ерда $W_{тр}$ – куч трансформаторига келиб тушувчи электр энергия сони

$$W_{тр} = W_{п} - W_{с} - W_{тр.а} \text{ кВт.с}$$

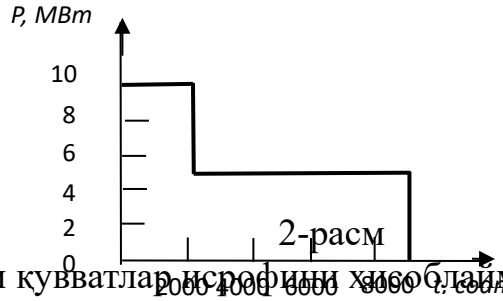
Электр тармоқларида электр энергия исрофларини ҳисоблаш

1-расмда келтирилган *35 кВ* кучланишли электр узатмада йиллик энергия исрофини берилган юклама графиги (4.10-расм) ва максимал исрофлар вақти τ бўйича ҳисоблаш талаб этилади.

Электр узатиш линиясининг узунлиги *15 км,* солиштирма параметрлари r_0*=0,28 Ом/км,* x_0*=0,43 Ом/км.* Ҳар бир трансформаторнинг номинал қуввати *6300 кВ·А (*$\Delta P_с$*=9,2 кВт,* $\Delta P_к$*=46,5 кВт).* $\cos\varphi$*=0,9.*



1-расм



2-расм

Юклама максимал бўлган ҳолатдаги қувватлар исрофини ҳисоблаймиз:

$$\Delta P_{Т} = 0{,}5 \cdot \Delta P_{к} \cdot \left(\frac{P_{макс}}{S_{н}\cos\varphi}\right)^2 + 2 \cdot \Delta P_{с} = 0{,}5 \cdot 46{,}5 \cdot \left(\frac{10}{6{,}3 \cdot 0{,}9}\right)^2 + 2 \cdot 9{,}2 = 72{,}17 + 18{,}4 = 90{,}57\ кВт;$$

$$\Delta P_{Л} = \frac{S^2_{макс}}{U^2_{н}} \cdot r_{Л} = \frac{\left(\frac{10}{0{,}9}\right)^2}{35^2} \cdot \frac{0{,}28 \cdot 15}{2} \cdot 10^3 = 211\ кВт;$$

$$\Delta P_{\Sigma} = \Delta P_{Т} + \Delta P_{Л} = 90{,}57 + 211 = 301{,}57\ кВт;$$

$$\Delta P_{\Sigma}^{*} = \frac{\Delta P_{\Sigma}}{P_{н}} = \frac{301{,}57 \cdot 100}{10000} = 3\%.$$

Бу ерда $\Delta P_{\Sigma}, \Delta P_{\Sigma}^{*}$ - электр тармоқдаги ҳақиқий ва фоиз бирлигидаги умумий актив қувват исрофи.

1) Йиллик энергия исрофини юклама графиги бўйича аниқлаймиз:

*ΔW=(72,17+211)*2000+0,5²(72,17+211)*6760+18,4·8760=*

=1200·10³ кВт·соат.

Йил давомида истеъмолчига узатилувчи энергия:

W=10·2000+5·6760=53,8·10³ МВт·соат.

Йиллик энергия исрофининг узатилувчи энергияга нисбатини аниқлаймиз:

$$\Delta W^{*} = \frac{1200 \cdot 10^3 \cdot 100}{53800 \cdot 10^3} = 2{,}23\%.$$

Шундай қилиб, ушбу ҳолатда энергия исрофи узатилувчи энергияга нисбатан 2,23% ни ташкил этади [7].

2) Йиллик энергия исрофини максимал исрофлар вақти τ бўйича аниқлаймиз. Бунда τ нинг қийматини соддалаштирилган формула бўйича топамиз:

$$T_{макс} = \frac{W}{P_{макс}} = \frac{53{,}8 \cdot 10^3}{10} = 5380 \ соат;$$

$$\tau = \left(0{,}124 + \frac{T_{макс}}{10000}\right)^2 \cdot 8760 = \left(0{,}124 + \frac{5380}{10000}\right)^2 \cdot 8760 = 3840 \, соат;$$

$$\Delta W = (71{,}17 + 211)3840 + 18{,}4 \cdot 8760 = 1248 \cdot 10^3 \ кВт \cdot соат;$$

$$\Delta W_* = \frac{1248 \cdot 10^3 \cdot 100}{53800 \cdot 10^3} = 2{,}32\%.$$

3) τ нинг қийматини типик эгри чизиқлар бўйича ҳам топиш мумкин. Биз кўриб чиқаётган – максимал юкламадан фойдаланиш вақти $T_{макс}=5380$ *соат* ва $\cos\varphi=0{,}9$ бўлган ҳолат учун ушбу эгри чизиқлар бўйича $\tau=3650$ *соат* эканлигини аниқлаймиз (қўлланмадан). У ҳолда йиллик энергия исрофи қуйидаги миқдорни ташкил этади:

$$\Delta W=(72{,}17+211)*3650+18{,}4 \cdot 8760=1195 \cdot 10^3 \ кВт \cdot ч,$$

$$\Delta W_* = \frac{1195 \cdot 10^3 \cdot 100}{53800 \cdot 10^3} = 2{,}22\%.$$

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ЭЛЕКТР ЭНЕРГИЯСИНИНГ КЎРСАТКИЧЛАРИ АСОСИЙ СИФАТИ

Аннотация:*Электр тармоқлари электр энергияни ишлаб чиқарадиган жойдан электр истеъмолчилари жойлашган жойга узатиб ва электр истеъмолчилари ўртасидаги тақсимланишига хизмат қилади.*

Kalit so'zlar: *Бундай ҳолда, електр тармоқларига қуйидаги бешта асосий талаблар қўйилади: ишончлилик, сифат, тежамкорлик (самарадорлик), хавфсизлик ва фойдаланиш қулайлиги ва янада кенгайтириш имконияти.*

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THE MAIN QUALITY OF ELECTRICAL ENERGY INDICATORS

Abstract: *Electric networks serve to transmit electricity from the place of production to the location of electricity consumers and distribute it among electricity consumers.*

Keywords: *In this case, the following five basic requirements are imposed on electrical networks: reliability, quality, economy (efficiency), safety and ease of use, and the possibility of further expansion.*

Енергияни сифати. Ҳар бир истеъмолчи сифатли энергия билан таъминланиши зарур. Бу сифат кучланиш ва частотани қиймати, уч фазали кучланишни симметрияси ва кучланиш шакли эгри чизиғи билан белгиланади. “Електро энергия сифати” термини тагида энерго система асосий параметрларининг электр энергияни ишлаб чиқиш, узатиш ва тақсимлаш ўрнатилган меёрларига мослиги тушунилади [1].

Електро энергия сифатинг миқдорий характеристикалари қуйидагилар билан ифодаланади:

– кучланиш ва частотанинг оғишлари;
– кучланиш ва частота тебранишларининг кенглиги (размах);
– кучланиш шаклининг носинусоидаллик коеффитсиенти;
– асосий частотали кучланишнинг носимметрия коеффитсиенти.

Частотани ўз қийматидан оғиши моторларнинг ва улар боғланган қурилмаларнинг айланиш тезлигини ўзгаришига олиб келади. Бу эса технологик жараёнларни йўлдан чиқишига олиб келиши мумкин, шунинг

учун, ҳозирги вақтда частотани мумкин бўлган оғиш даражаси фақатгина 0,1 Ҳз қилиб қабул қилинади.

Частотанинг ўгишлари – асосий частотанинг номинал қиймати ва ҳақиқий қиймати орасидаги 10 минут ичидаги ўртача фарқи. Нормал режимда частотанинг номинал қийматидан оғиши ± 0,1 Ҳз оралиғида рухсат этилган. Қисқа муддатли оғишлар ± 0,2 Ҳз га етиши мумкин.

Частота тебраниши – частота ўзгариши тезлиги бир секундда 0,2 Ҳз дан кам бўлмаган холда, яъни режим параметрлари етарлича тез ўзгариши жараёнида асосий частотанинг энг катта ва энг кичик қийматлари орасидаги фарқи [2]. Частота тебранишлари рухсат этилган 0,1 Ҳз оғишларидан 0,2 Ҳз га ошиши мумкин эмас:

$$\delta f = f_{\max} - f_{\min}, \qquad \delta f_{\%} = \frac{f_{\max} - f_{\min}}{f_{nom}} \cdot 100\%. \qquad (1.1)$$

Кучланишни керак бўлган қийматдан камайиши ёки ошиши мақсадга мувофиқ эмас. Кучланишни ўзгариши генераторларни электр юритувчи кучи ёки юклама ўзгариши туфайли электр тармоқларидаги кучланиш йўқотилишини ўзгаришига боғлиқ. Чўғланиш лампаларида ва бошқа ёруғлик манбаларида кучланишни камайиши ёруғликни камайишига ва бошқа ноҳуш ҳолатларга олиб келади. Кучланишни ошиши лампани ҳизмат муддатини камайтиради. Шундай қилиб, кучланишни ошиши ҳам, камайиши ҳам иқтисодий чиқимга олиб келади. Энг кам иқтисодий йўқотиш энг мақбул кучланишда бўлади. Ускуналар шундай тузилган бўлиши керакки номинал кучланиш мақбул кучланишга тенг бўлсин. Буни аниҳсрон моторлар мисолида ҳам кўриш мумкин [3].

Кучланиш оғишини камайтириш учун маҳсус усуллар қўлланилади, масалан, юкланган ҳолда ростловчи трансформаторлардан (ЮҲРТ) фойдаланиш, компенсатсия ускуналарини (КУ) ўрнатиш ва ҳоказо...

Кучланиш оғишлари – кучланиш оғишининг тезлиги бир секундда 1% дан кам бўлган ҳолда, яъни ишлаш режими нисбий секин ўзгаришида тармоқ кучланишининг ҳақиқий қиймати ва унинг номинал қийматидаги ҳосил бўладиган фарқи:

$$\Delta U = U - U_{nom}, \qquad \Delta U_{\%} = \frac{U - U_{nom}}{U_{nom}} \cdot 100\%. \qquad (1.2)$$

Нормал иш шароитида қуйидаги чегараларда кучланиш оғишлари рухсат этилади: -5+10% – электр мотор ва аппаратларни қисмаларида , уларни ишга тушириш ва бошқариш учун; -2,5+5% – ишчи ёритиш асбобларининг қисмаларида; ±5% – электр энергия қолган истеъмолчиларнинг қисмаларида. Авариядан кейинги режимларда кучланишнинг қўшимча 5% га пасайиши рухсат этилади.

Кучланиш тебраниши

Кучланиш тебраниши қуйидаги кўрсаткичлар билан баҳоланади:

1. Кучланиш ўзгариши кенглиги δU билан, яъни кучланишларнинг энг катта ва энг кичик таъсир этувчи қийматлари орасидаги фарқи билан (1.6-расм), бунда режим параметрлари етарлича тез ўзгариши жараёнида бўлади, яъни кучланиш ўзгаришининг тезлиги бир секундда 1% дан кам бўлмаган ҳолда:

$$\delta U_{\%} = \frac{U_{\max} - U_{\min}}{U_{nom}} \cdot 100\% \qquad (1.3)$$

(1.6-расмда 12 секунд ичида кучланишнинг 5 та тебраниш силкиниши мажвуд).

2. Кучланишни ўзгариши частотаси билан (1/с, 1/мин, 1/соат)

$$F = m / T \qquad (1.4)$$

Бу ерда m – Т вақт оралиғида бир секундда 1% дан кўп бўлмаган ўзгаришлар тезлигида ўзгарадиган кучланишлар сони [4].

3. Иккита кетма-кет ўзгаришлари орасидаги интервал Δt_{kj} .

Кўпчилик ўзгарувчан ток истеъмолчилари учун кучланиш эгри чизиғи синусоида шаклида бўлиши зарур. Кучланиш шаклини синусоидадан оғиши генераторларни электр юритувчи кучлари синусоидал бўлмагани, системада ночизиқли элементларни мавжудлиги сабабли (масалан, тўйинган пўлат ўзаклари, ярим ўтказгичлик ток ўзгарувчи ускуналар ва ҳ.к.) келиб чиқади.

Моторлар учун кучланишни синусоидадан оғиши қўшимча қувват исрофига ва тебранишга олиб келади, лекин фойдали ишга таъсир кўрсатмайди, чунки моторнинг ўртача айлантириш моментини фақат биринчи (асосий) гармоника ҳосил қилади. Ўзгармас ток истеъмолчилари учун кучланиш шакли тўғри чизиқли ўзгарувчан ташкил этувчиларисиз, бўлиши керак. Ўзгарувчан ташкил этувчилар ток тўғрилагич ускуналарини сифатсизлиги сабабли келиб чиқади ва улар ҳам ўзгармас ток истеъмолчиларига (електролиз, ўзгармас ток моторлари) зарар етказиб, қўшимча энергия исрофига олиб келади.

Тармоқ кучланишининг носинусоидаллиги кучланиш шаклининг носинусоидаллик коеффитсиенти билан характерланади ва қуйидаги формула бўйича аниқланади:

$$K_{\overline{\sin}} = \frac{\sqrt{\sum_{n=2}^{\infty} U_n^2}}{U_1} \cdot 100\% \approx \frac{\sqrt{\sum_{n=2}^{\infty} U_n^2}}{U_{nom}} \cdot 100\%, \qquad (1.5)$$

бу ерда

U_n – кучланиш n -гармоникасининг таъсир этувчи қиймати;

U_1 – кучланиш биринчи ёки асосий гармоникасининг таъсир этувчи қиймати.

Ҳарқандай электр энергия истеъмолчининг қисмаларида кучланишнинг носинусоидаллик коеффитсиенти 5% дан ошмаслиги керак [5].

Уч фазали симметрик системаларда ҳамма кучланишлар ўзининг абсолют қиймати бўйича тенг бўлиб, улар орасидаги бурчак 120° бўлиши керак: шунда улар фақат тўғри кетма-кетликни ташкил қилади. Симметрияни бузилиши бир фазали тенг бўлмаган юкламалар мавжудлиги, фазалардаги параметрларни носимметрик бўлиши сабабли келиб чиқади.

Симметрияни бузилиши тескари ва нолинчи кетма-кетлигини ёки уларнинг иккаласини ҳам бир вақтнинг ўзида пайдо бўлишига олиб келади. Кучланишни тескари кетма-кетлиги токни тескари кетма-кетлигини келтириб чиқаради. Бу эса, ўз навбатида, уч фазали моторлар ҳаракатини тормоз қилади, қувват исрофини кўпайтиради, генератор роторларини ҳосил бўлган тескари магнит майдони кетма-кетлиги орқали қўшимча қиздиради.

Кучланишни нолинчи кетма-кетлиги ҳам қувват исрофини оширади, қўшни алоқа линияларига зарарли таъсир этади. Нолинчи кетма-кетлик токлари эса, ерда оқа туриб ер остидаги иншоатларни коррозияга (чиришга) олиб келади. Бундан ташқари нормал ҳолларда ток ва кучланишларнинг нолинчи кетма-кетликларини бўлиши реле ҳимоясини носимметрик қисқа туташув пайтида танлаб ишлаш ҳусусиятини йўқотиб қўйишига олиб келиши мумкин [6].

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ВЕЩЕСТВА, ИСПОЛЬЗУЕМЫЕ ДЛЯ ХИМИЧЕСКОГО АНАЛИЗА ТРАНСФОРМАТОРНЫХ МАСЕЛ И ПРОЦЕССОВ ИХ ПОДГОТОВКИ

Аннотация: *В данной статье представлена информация о химическом анализе трансформаторного масла, которое служит изоляцией в электрических устройствах на масляной основе, и химических веществах, используемых в процессе анализа. Эти химические вещества играют значительную роль в получении качественных и точных результатов анализа.*
Ключевые слова: *Трансформаторное масло, электрооборудование с маслом, химический анализ, влага, щелочь, кислота, стандарты, кислотность.*

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SUBSTANCES USED FOR THE CHEMICAL ANALYSIS OF TRANSFORMER OILS AND THEIR PREPARATION PROCESSES

Abstract: *This article provides information about the chemical analysis of transformer oil, which serves as insulation in oil-based electrical devices, and the chemicals used in the analysis. These chemicals play a significant role in obtaining high-quality and accurate analytical results.*
Key words: *Transformer oil, electrical equipment with oil, chemical analysis, moisture, alkali, acid, standards, acidity*

Введение. Развитие электроэнергетики и электротехнического машиностроения напрямую связано с использованием широкого ассортимента электроизоляционных материалов. Быстрый прогресс науки и техники требует повышения требований к условиям эксплуатации электротехнической изоляции. Соответственно, возрастает значение испытаний, определяющих соответствие электроизоляционных материалов техническим условиям и стандартам. Для получения достоверных и точных результатов используются специальные приборы и химические вещества.

Трансформаторы в энергетической системе служат для передачи, приёма и распределения электрической энергии. Качество

трансформаторного масла, залитого в оборудование, имеет большое значение для надёжной и продолжительной эксплуатации.

Кратко о трансформаторном масле: это продукт, получаемый при нагреве нефти до 280–420°С, содержащий серосодержащие и парафинистые углеводороды. В производстве используется очищенное масло без серы и парафинов. В энергетике применяются масла следующих марок: ТКп/ТУ-38101890-81, Т-750/ГОСТ 982-80, Т-1500/ГОСТ 982-80, ТАп/ТУ 38.101.281-80, ТСн Уз.ДСт 988-2001, ГОСТ 10121-76, ГК ТУ-38.101.1025-85, АГК ТУ 38.101.1277-89, МВГ ТУ 38.401.927-92.

Наиболее широко используется трансформаторное масло марки ТСн Уз.ДСт 988-2001, которое по состоянию делится на: новое, чистое, сухое, регенерированное, бывшее в эксплуатации и переработанное.

Масло в электрических устройствах выполняет изолирующую функцию и служит основной защитной оболочкой. В зависимости от назначения заливается в силовые трансформаторы, устройства РПН, измерительные трансформаторы и масляные выключатели. Для трансформаторов мощностью до 100 кВА (U<10 кВ) анализ масла не проводится, его состояние оценивается по профилактическим испытаниям. Масло отражает состояние трансформатора. Для надёжной работы масло должно соответствовать стандартным показателям. Поэтому оно регулярно проверяется. Новое масло принимается по паспорту. Его качество определяется наличием примесей. При содержании 0,01–0,02 % влаги пробивное напряжение снижается в 4–5 раз. Причина — полярные капли воды (ε=80) в неполярной среде масла (ε=2,2), которые образуют цепочки и притягиваются между электродами. Для образования цепочки достаточно минимальной влаги, при дальнейшем увеличении влаги пробивное напряжение не снижается. В неравномерном поле крупные капли оседают на дно и не влияют на пробой. Однако влажность имеет важное значение. Поэтому масло сушится: продувкой сухим азотом, углекислым газом или под вакуумом (20–30 кПа) до остаточного давления 2,5–5,5 кПа при температуре 40–50°С.

В условиях мелких ремонтных мастерских масло нагревают до 25–35°С и отстаивают. Это простой, но длительный способ. Нагревание в собственном баке с собственным током — дёшево, но длительное воздействие ухудшает свойства масла. Масло должно быть не только сухим, но и чистым. В процессе эксплуатации оно загрязняется. Для удаления воды и механических примесей применяется центрифугирование при 45–55°С. При низкой температуре примеси отделяются хуже, при высокой — вода растворяется в масле и испаряется, ускоряя старение масла.

Фильтрация проводится через картон, бумагу, ткань, силикагель или другие пористые материалы с мелкими порами. Используется фильтр-пресс. Картон удерживает не только примеси, но и влагу. Применяется мягкий, пористый, гигроскопичный картон. Однако он плохо удерживает шлам и уголь и выделяет волокна. Поэтому используется сочетание мягкого и твёрдого картона. Оптимальная температура фильтрации — 45–50°С. При

повышении температуры гигроскопичность снижается, а растворимость воды возрастает. Картон периодически промывается, сушится и повторно используется. Для очистки 1 тонны масла требуется 1 кг картона.

Масло отражает общее состояние трансформатора. Его качество должно соответствовать стандартам, поэтому требуется постоянный контроль. В процессе эксплуатации масло не только увлажняется и загрязняется, но и окисляется. Это требует проведения химического анализа.

При окислении масла изменяется его химический состав: образуются кислоты и смолы, разрушаются природные антиоксиданты. Это ускоряет разрушение изоляции трансформатора. Сначала разрушаются углеводороды (3–5 % состава), что приводит к старению масла. Масло подлежит регенерации — возвращению к исходным показателям. После этого оно может использоваться ещё 5–7 лет. Однако его стабильность снижается, и необходимы профилактические испытания. Статистика показывает, что 30 % неисправностей трансформаторов связаны с некачественным маслом. Поэтому регулярный химический анализ является важной мерой по продлению срока службы масла и оборудования.

Методы. Перед вводом оборудования в эксплуатацию, в процессе эксплуатации и при выявлении неисправностей отбираются пробы масла для химического и хроматографического анализа. Пробоотбор должен осуществляться квалифицированным специалистом. При плохих погодных условиях пробу не отбирают. Специальная посуда промывается мыльным порошком, несколько раз ополаскивается тёплой водой, затем сушится горячим воздухом или в сушильном шкафу при 100°С в течение 2–3 часов. Объём посуды — 0,8–1 литр.

Показатели сокращённого и физико-химического анализа масла: цвет и внешний вид (визуально), механические примеси, углеродная сажа, влага (визуально), пробивное напряжение, степень окисления, температура вспышки, наличие растворимых кислот и щелочей, тангенс угла диэлектрических потерь при 90°С и содержание влаги.

Электрический анализ включает определение: пробивного напряжения, температуры вспышки и тангенса угла диэлектрических потерь.

Химический анализ включает: степень окисления, наличие растворимых кислот и щелочей, содержание влаги.

Подготовка химических веществ:

1. Подготовка 100 г 85% этилового спирта: 89 см³ спирта + 11 см³ дистиллированной воды. Используется для определения степени окисления масла.

2. Подготовка 0,5% водного раствора нейтрального жёлтого: 0,5 г вещества + 100 см³ дист. воды. Используется для выявления водорастворимых кислот и щелочей.

3. Подготовка 0,05% спиртового раствора КОН: 3 г КОН растворяют в 100 мл этанола, выдерживают в тёмном месте 24 часа в тёмной бутылке с пробкой.

4. Приготовление водного раствора KOH: 56 г KOH на 1 л воды — 0,1 л раствора. 28 г KOH на 0,5 л воды — 0,05% раствор. 14 г KOH на 250 мл воды — 0,025% раствор.

5. Приготовление растворов HCl: 0,1 N HCl: 1/10 г концентрата + 1 л воды. 0,05% HCl: 150 мл 0,1 N HCl + 150 мл воды. 0,025% HCl: 150 мл 0,05% HCl + 150 мл воды.

6. Приготовление цветного силикагеля (500 г): 20 г $CaCl_2$ + 60 мл воды; 15 г $CoCl_2$ + 15 мл воды; добавить в силикагель, высушить при 90–100°C до синего цвета.

7. Определение влагопоглощения силикагеля: Взвешивается бюкс с 1,5–2 г силикагеля, сушится при 150°C 3 часа, затем помещается в эксикатор до стабилизации массы. $Xs = (m_1 – m_2) \times 100 / m$, где: m_1 — масса до сушки, m_2 — после сушки, m — масса силикагеля.

Определение титра:

1. 5 мл 0,05% HCl + 2–3 капли фенолфталеина — цвет не меняется.

2. 5 мл 0,05% KOH добавляется к HCl до розового оттенка, устойчивого 3 секунды. Титр = 5,4 / 5 = 1,08.

Вывод: эксплуатация жидкого диэлектрика — трансформаторного масла — требует контроля его качества и регулярного анализа. Только при соблюдении установленных нормативов можно обеспечить надёжную работу оборудования.

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СТРУКТУРА ПАРАГЕНЕТИЧЕСКИХ ЛАНДШАФТНЫХ КОМПЛЕКСОВ В ДЕЛЬТОВЫХ ГЕОСИСТЕМАХ

Аннотация. *В статье впервые изучены выделенные на современной дельты Амударьи парагенетических ландшафтных комплексов бассейнов коллектора. Морфологические и парагенетические взаимосвязи в бассейнах коллектора основывались по полевым данным. Вместе с тем было показано, что три бассейна коллектора в современной дельте Амударьи отличаются друг от друга по площади элементарных ландшафтных групп. Выявлены закономерности дифференциации элементарных ландшафтных групп идеализированного коллектора.*

Ключевые слова: *дельта, геосистема, ландшафт, ландшафтные комплексы, площадь, коллектор, бассейн.*

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STRUCTURE OF PARAGENETIC LANDSCAPE COMPLEXES IN DELTA GEOSYSTEMS

Abstract. *The article examines the study of paragenetic landscape complexes of collector basins isolated in the modern Amu Darya delta. Reservoir morphological and paragenetic relationships were based on field data. At the same time, it was shown that three collector basins in the modern Amu Darya delta differ from each other in the area of elementary landscape groups. The regularities of stratification of elementary landscape groups of an idealized reservoir are revealed.*

Key words: *delta, geosystem, landscape, landscape complexes, area, collector, basin.*

Введение. В статье раскрываются морфологические и парагенетические связи парагенетических ландшафтных комплексов в коллекторных бассейнах, выделенных на орошаемых территориях современной дельты Амударьи. При этом научно обоснованы различия в площади элементарных ландшафтных группировок в трех коллекторных бассейнах.

Область и методы исследования. Коллекторные бассейны орошаемых территорий современной дельты Амударьи впервые изучались на основе теории парагенетических ландшафтных комплексов. Взаимосвязь

элементарных ландшафтных групп в коллекторных бассейнах рассматривалась на основе концепции геохимического ландшафта.

Результаты и обсуждение. Понятие парагенетических ландшафтных комплексов впервые было использовано в литературе Ф.Н. Мильковым (1966), а понятие парагенетических ландшафтных комплексов коллекторных бассейнов впервые было использовано А.К. Уразбаевым (2002), когда он впервые исследовал коллекторные бассейны как геосистему.

Образовавшиеся в дельте в процессе «лито-морфо-педогенеза» три формы рельефа (прирусловые возвышенности, склоны возвышенностей, межрусловые низменности) были взаимосвязаны, и наблюдалась закономерность в слоистости отложений. В межрусловых низменностях значительна роль прирусловых возвышенностей и склонов в отложении тяжелых песков и болот. В результате в межрусловых низменностях сформировались болотно-луговые и болотные почвы тяжелого механического состава. Формирование гидроморфных ландшафтов тяжелого механического состава является результатом взаимосвязи прирусловых возвышенностей и склонов. Поэтому связь между тремя формами рельефа научно правильно называть морфологической связью.

Три формы рельефа, сформировавшиеся в истории дельты, соответствуют элювиальным, трансэлювиальным и супераквальным элементным ландшафтам в терминах концепции геохимического ландшафта. Динамика и развитие образующихся гидроморфных ландшафтов зависят от взаимосвязи элементарных ландшафтных групп. Геохимические особенности супераквального элементного ландшафта связаны с элювиальными и трансэлювиальными элементными ландшафтами. Миграция химических элементов между этими элементарными ландшафтными группами, в свою очередь, является основой парагенетических связей. Изучение морфологических и парагенетических связей между элементарными ландшафтными группами, в свою очередь, является основой подхода к теории геосистем со стороны концепции геохимического ландшафта.

В коллекторных бассейнах, расположенных на правом берегу современной дельты Амударьи, элементарные ландшафтные группы располагаются последовательно (рис. 1). В верхней части идеализированного коллекторного бассейна на рис. 1 преобладает элювиальный элементарный ландшафт, а в нижней части основную территорию занимает супераквальный элементарный ландшафт. Расположение элементарных ландшафтных групп в таком порядке влияет на мелиоративное состояние почв. Поэтому в нижней части коллекторных бассейнов доминирует сильнозасоленный супераквальный элементарный ландшафт.

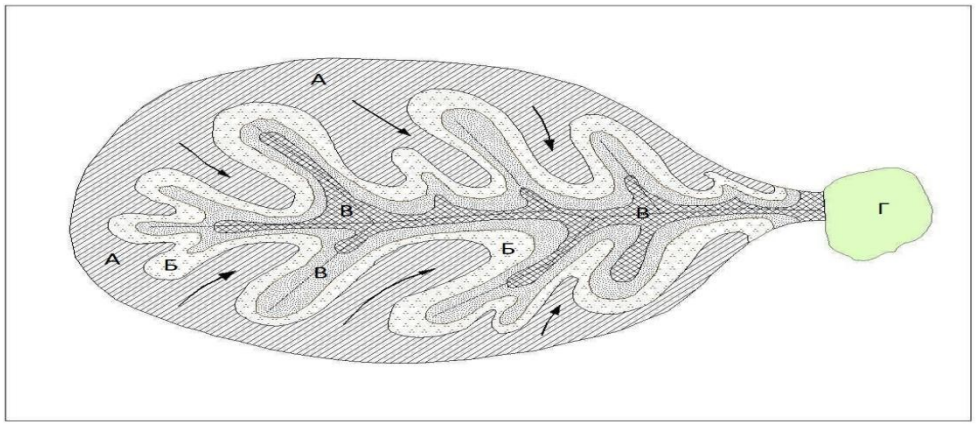

Рисунок 1. Стратификация элементарных ландшафтных групп в идеализированном коллектора сброса.

А- элювиаль; Б- транс-элювиаль; В- суперакваль; Г) - аквал (озера).

В то же время коллекторные бассейны правобережья дельты Амударьи, а именно бассейны КС-1 (КС-1), КС-3 и КС-4, различаются также по площадям элементарных ландшафтных групп (рис. 2 и табл. 1). В верхних частях всех

Таблица 1

	КС-1			КС-3			КС-4		
	Верхний	Середина	Нижняя часть	Верхний	Середина	Нижняя часть	Верхний	Середина	Нижняя часть
Элювиаль ланшафт	55	30	15	45	15	10	25	15	5
Транс элювиаль ланшафт	30	35	40	25	30	25	20	25	25
Супер аквал ланшафт	15	35	45	30	55	65	55	60	70
ВСЕГО	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***

Рисунок 2. Стратификация элементарных ландшафтных групп в бассейнах КС-1, КС-3, КС-4

коллекторных бассейнов в той или иной степени преобладает элювиальный элементарный ландшафт, а в нижних частях, наоборот, основную площадь занимает супераквальный элементарный ландшафт. Большое значение в стратификации парагенетических ландшафтных комплексов коллекторных бассейнов имеет строение рельефа. Таким образом, морфологические и парагенетические связи, складывающиеся в парагенетических ландшафтных комплексах, являются основным фактором, определяющим геохимическую динамику ландшафтов.

Заключение**.** Парагенетические ландшафтные комплексы коллектор сборных бассейнов являются объективным образованием на орошаемых территориях; Междуречные понижения изучались одновременно как часть

парагенетических ландшафтных комплексов, то есть как надводный элементарный ландшафт (морфологическая связь) и как неотъемлемый компонент комплекса (парагенетическая связь); С одной стороны, элементарные ландшафтные группы коллектора сборных бассейнов образуют парагенетические ландшафтные комплексы, а с другой стороны, они образуют единый геохимический ландшафт; Исследования коллектора сборных бассейнов на основе парагенетических ландшафтных комплексов и геохимических ландшафтных теорий могут стать теоретической основой для использования бассейнового метода при рациональном использовании их природных ресурсов в будущем.

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ИССЛЕДОВАНИЕ ВОДОСБЕРЕГАЮШЕГО ВНУТРИПОЧВЕННОГО МЕТОДА ОРОШЕНИЯ ХЛОПЧАТНИКА

Аннотация. *В статье представлены результаты научных исследований по применению водосберегающего внутрипочвенного орошения в условиях лугово-сероземных, среднесуглинистых почв Андижанской области при уровне грунтовых вод 2,0–2,5 метра. Практическая значимость полученных результатов заключается в экономии речной воды за счёт использования усовершенствованной водосберегающей технологии внутрипочвенного орошения на лугово-серых, среднесуглинистых почвах Андижанского региона, снижении негативных последствий дефицита воды, повышении эффективности использования 1 м³ воды, а также увеличении объёма сельскохозяйственной продукции с орошаемых земель.*

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RESEARCH ON WATER-SAVING INTRA-SOIL IRRIGATION METHOD FOR COTTON

Annotation. *The paper presents the results of research work on the use of water-saving intra-soil irrigation in the conditions of meadow-serezomysty, medium-sandy loam soils of the Andijan region, when the ground water levels are 2.0-2.5 meters. The practical significance of the research results is to save river water through the use of improved, water-saving technology of intra-soil irrigation in meadow-gray-sandy, medium-sandy soils of the Andijan region, reduce the negative consequences of water scarcity, increase the efficiency of using 1 m^3 of water, increase the volume of agricultural products from irrigated lands.*

В настоящее время в Республике Узбекистан проводятся масштабные ирригационные и мелиоративные мероприятия, направленные на улучшения мелиоративного состояния оросительных земель, плодородия почв, эффективное использование водных ресурсов в условиях дефицита воды и формирования дополнительных источников водных ресурсов.

Непрерывное улучшение урожайности хлопчатника требует постоянного совершенствования перспективных методов орошения почвы, что позволит сэкономить сельскохозяйственную воду и других ресурсов.

Целью научных исследований является в условиях лугово-серезомыстых, средне-супесчанных почвах Андижанской области, при залегании уровни грунтовых вод 2,0-2,5 метра, определить оптимальные

методы полива хлопчатника сортов Андижан-35 и Андижан-36, изучить технологию внутрипочвенного орошения и разработать научные и практические рекомендации для фермеров и водохозяйственных организаций.

Андижанский филиал Ташкентского государственного аграрного университета провел эксперимент по внутрипочвенному орошению хлопчатника на одном гектаре в учебно-опытном хозяйстве (ГУП) в 2019 году.

Научная значимость исследовательской фауны заключается в уменьшении негативных последствий растушей нехватки воды, нового научного подхода к экономии речных вод и влияния улучшенной технологии внутрипочвенного орошения на режим орошения, рост, развитие и урожайность сортов хлопчатника на лугово-сероземыстых, средне-супесчанных почвах, а также на водно-физические свойства почвы и на уровень залегании грунтовых вод.

Практическая значимость результатов исследования заключается в экономии речной воды за счет использования усовершенствованной, водосберегающей технологии внутрипочвенного орошения в лугово-сероземыстых, средне-супесчанных почвах Андижанской области, снижения негативных последствий дефицита воды, повышения эффективности использования 1 $м^3$ воды, увеличения объема селькохозяйственной продукции с орошаемых земель. Это объясняется удовлетворением спроса населения на продукты питания.

Почва опытного поля лугово-сероземыстая, по механическому составу средне-супесчанная, уровень залегания грунтовых вод составляет 2,0-2,5 метра.

Экспериментальные варианты проведены на одном ярусе в четырех повторности. Общая площадь опытного поля 1 га. Площадь первой части – 240 $м^2$, длина – 100 м, ширина – 2,4 м, площадь второй части 360 $м^2$, длина – 10 м, ширина – 3,6 м.

Каждая часть состоит из восьми рядов, междурядное расстояние в трех вариантах – 60 см, в трех вариантах -90 см, Из них средние 4 ряды расчетные, по два ряда каждом краю являются защитными.

Во время проведения опыта выполнены следующие работы: наблюдение, измерение и анализ полученных данных [1,2,3].

1. Морфологическая структура почвы изучена накануне опыта. Для этого закопаны разрез почвы до глубины уровня грунтовых вод и по генетическим слоям определена морфология почвы.

2. Механический состав почвы на основе взятых проб по генетическим слоям в глубине до 1 м. определен по методу Н.А.Качинского.

3. Количества гумуса, общего азота, фосфора и калия в почве опытного поля определены в начале и конце вегетации в глубинах слоев 0-30 см и 30-50 см. Количество гумуса определено по методу Тюрина, Количества общего азота и фосфора определены по методам Кеълдала и Лоренца, Анализ активного фосфора сделан по методу Б.П.Мачигина, а анализ обмена калия сделан по методу П.В.Протасова.

4. Объемная масса почвы определена весной по диогоналу поля в трех точках, осенью по порядкам полива в каждой 10 см глубины слоя до 100 см по цилиндрическому методу.

5. Удельный вес почвы определен по пикнометрическим способам. По полученным объемной массы и удельного веса рассчитана пористость почвы.

6. Водопроницаемость почвы определена в трех точках по диогоналу общего поля в конце вегетации по методу металлического цилиндра.

7. Предельная полевая влагоемкость (ППВ) определена весной прежде чем размещения вариантов опыта, с помощью заполнения водой участок поля рамочным методам. Для определения влажности почвы опытного поля были взяты по трем пробам в каждой 10 см глубины слоя до 100 см.

8. Перед первым поливом влажность почвы определена по методу термостат-весы, а во время вегетации с помощью рефрактометра на основе концентрации нектар в растении. Почвенные пробы были взяты для каждого варианта и для каждой повторности. В весной и осенью количества резерва влаги в почве определены в глубине до двух метров, а во время вегетации в каждой 10 см глубины слоя до 100 см.

9. Расход оросительной воды определен по показанию расходомерного устройства.

10. Действительная плотность (количества) растений на опытном поле определена в двух сроках: в начале и конце вегетации, в конце вегетации перед сборам урожая, по методу расчета общего количества растений в каждой части поля в каждой повторности.

11. Вес хлопка в одном кураке определен перед каждым сбором хлопка, по навешенным ярликам на растении для каждого варианта и каждой повторности.

НИИССАХ по установленным стандартам.

По результатам исследований сделаны следующие выводи:

1. Срок службы поливных шлангов заложенные в глубине почвы 50 см состаляет 20 лет. По мимо того резкое сокрашение использования сельскохозяйственной техники позволить сэкономить горюче-смазочных материалов и других ресурсов;

2. Достигнуто улучшение воздушно-температурное состония почвы, что позволила предотвращать образования почвенной корки

3. Создание оптимальных условий для корневых систем хлопчатника привело к улучшению обеспеченности растений влагой, питательных веществ и других средств нормального развития

4. Системой внутрипочвенного орошения питательные растворы подаются прямо в корням растений.

5. Нет необходимости проведения таких полевых работ как борьба с вредителями, подготовка земель к посеву, обогашение земель органическим и минеральным удобрениями, работы связанные с борьбой против сорняков и другие механизированные агротехнические мероприятий.

6. Повышается эффективность использования минеральных удобрений. Экономия поливной воды состаляет 40-50 %.

7. Использование внутрипочвенного орошения хлопчатника полностью предотвращает сброс поливной воды на стоки, что приведет к прекрашению водной эррозии почвы.

8. Сэкономленное количество поливной воды составило 2400 $м^3$/га.

Использованные источники:

1. Методика полевого опыта (с основами статистической обработки результатов исследований) : Учебник для студентов высших сельскохозяйственных учебных заведений по агрономическим специальностям / Б.А. Доспехов. - 5-е издание, дополненное и переработанное. - Москва : Агропромиздат, 1985. - 351 с.

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КОРМОРАЗДАТЧИК С РЕГУЛИРУЕМЫМ ЭЛЕКТРОПРИВОДОМ ДЛЯ ПОВЫШЕНИЯ РАВНОМЕРНОСТИ РАЗДАЧИ

Аннотация: *В статье рассматриваются конструктивные и технологические недостатки существующих скребковых кормораздатчиков, применяемых на животноводческих комплексах. Отмечена проблема неравномерности подачи корма, приводящая к отклонению от зоотехнических норм. Приведены результаты экспериментальных исследований, выявивших влияние изменения скорости транспортера на равномерность раздачи. Предложена система программного управления на базе тиристорного регулируемого электропривода, позволяющая реализовать оптимальный закон изменения скорости кормораздатчика. Разработанная система обеспечивает снижение неравномерности кормления до ±7…3 %, что соответствует зоотехническим требованиям.*

Ключевые слова: *кормораздатчик, скребковый транспортер, тиристорный электропривод, равномерность раздачи, автоматизация, управление скоростью, зоотехнические нормы.*

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FEED DISPENSER WITH ADJUSTABLE ELECTRIC DRIVE TO INCREASE UNIFORMITY OF DISTRIBUTION

Abstract: *The article examines the design and technological shortcomings of conventional scraper feed dispensers used in livestock farms. It emphasizes the problem of feed distribution non-uniformity, which leads to deviations from zootechnical standards. The results of experimental studies reveal the effect of conveyor speed variation on feed distribution uniformity. A programmable control system based on a thyristor-regulated electric drive is proposed to implement the optimal speed variation law. The developed system reduces feed distribution irregularity to ±7…3 %, meeting zootechnical requirements.*

Keywords: *feed dispenser, scraper conveyor, thyristor electric drive, distribution uniformity, automation, speed control, zootechnical standards.*

Введения: Как известно, каждому животному необходимо выдавать определенную дозу корма. Увеличение или уменьшение этой дозы приводит к непроизводительному расходу корма или снижению продуктивности скота.

Опыт эксплуатации системы кормораздачи на животноводческих фермах и промкомплексах как у нас так и зарубежом показывает, что скребковый транспортёр-кормораздатчик имеет ряд конструктивных и технологических недостатков.К ним относятся:

-реечное зацепление и направляющие механизмы управления вариатором который предназначен для регулирования скорости кормороздатчика забываются пылевидным комбикормом, в результате чего резко возрастаеть сопротивление вращению маховика.Оператор вынужден пользоваться дополнительным рычагом для поворота маховика и прилагать к этому рычагу значительное усилие;

-фрикционная пара вариатора при перегрузке пробуксовывает вплоть до остановки транспортера, что приводит к оброзованию завалов;

-зубчатая пара конечной передачи систематически забивается кормом.В результате увеличения распирающих сил в зацеплении бронзовая втулка зубчатого колеса и приводной звездочки быстро выходит из строя.Регулярная очистка впадин между зубьями и шестерни от скорма является трудоемкой и малоэффективной операцией;

-наблюдаються частые случаи заедания шарниров цепи, вследствие коррозии опорных поверхностей шарниров и загрязнения их комбикормом многие звенья цепи после схода со звездочки не выправляются, скрепки идут с перекосом;

-в результате заведания скребков за неровности в местах стыка бетонных элементов кормушки они гнутся и ломаются, рвутся цепи;

-винт и гайка натяжной станиции не защищены от попадания пыли и грязи, в результате чего существенно возрастает потребное усилие рабочего органа для вращения винта в процессе изменения нятяжения цепы;

-неравномерность скармливания животных не соответствует зоотехническим нормам.

К недостаткам кормоприготовительной линии относятся:

-неравномерность подачи корма. В результате этого периодически возникают завалы или перерывы в подаче его.При перерывах в поступлении корма оператор остонавливает кормораздатчик, а при завалах увеличивает скорость его, применяя ручной труд при расталкивании завала;

-контроль равномерности загрузки транспортера осуществляется ориентировочно.

Материалы и выводы: Испытания линии приготовления и раздачи кормов проведенные нами позволили выявить одну из причин неравномерной раздачи корма. Она заключается в том, что животные, стоящие в начале кормушки, съедают часть корма непосредственно с транспортера во время его движения. В результате этого на их долю приходится корма больше, чем

установлено зоотехническими требованиями, а на долю животных, находящихся в конце кормушки, - меньше.

Чтобы снизить неравномерность раздачи корма, оператор сначала устанавливает нужную скорость транспортера, а в процессе раздачи изменяет её. Однако регулирование скорости при раздаче требует постоянного напряжения оператора и оказалось малоэффективным. Поэтому нами проводились экспериментальные исследования работы транспортера кормораздатчика с целью установить закон и способ изменения его скорости, обеспечивающие выполнение зоотехнических требований по неравномерности раздачи корма животным.

Отклонение действительной дозы от заданной

$$\delta = \frac{g_д - g_н}{g_н} 100$$

где $g_д$ – действительное количество корма, полученного животным, кг/м; $g_н$ – заданная доза корма, кг/м.

Результаты исследований: Анализ опытных данных (см. таблицу) показал, что действительное количество корма, полученное животным с одного метра кормушки, отличается от заданной нормы: у первых животных оно на 12,9 ….20,1% больше, а у последних на 13,6 ….21,1% меньше. При этом со снижением скорости кормораздатчика наблюдается повышение неравномерности раздачи. Следовательно, скорость транспортера необходимо регулировать по определённой программе.

Цикл раздачи, мин	Скорость транспортера, м/с	Доза выдачи корма, кг		Действительное количество корма, полученного животными с 1 м кормушки, кг		Отклонение от нормы на 1 м, %	
		на одно животное	на 1 м кормушки	первого	последнего	на первом	на последнем
8	0,16	6,0	14,0	15,8	12,1	+12,9	−13,6
9	0,14	7,0	16,5	19,0	13,6	+15,1	−17,6
10	0,13	7,6	17,8	20,6	14,3	+16,9	−18,4
11	0,12	8,3	19,0	22,6	15,3	+19,0	−19,5
12	0,11	9,0	20,3	24,4	16,0	+20,1	−21,2

Обсуждения: Расчеты показали, что в зависимости от продолжительности цикла к раздачи начальные скорости должны составлять 0,09…0,14 м/с, а конченные – о,136…0,183 м/с. На основания этих данных нами разработана система программного управления скоростью транспортера кормораздатчика с тиристорным регулируемым электроприводом, в которой использовано программное реле времени ВС-10-64 (рис 1.)

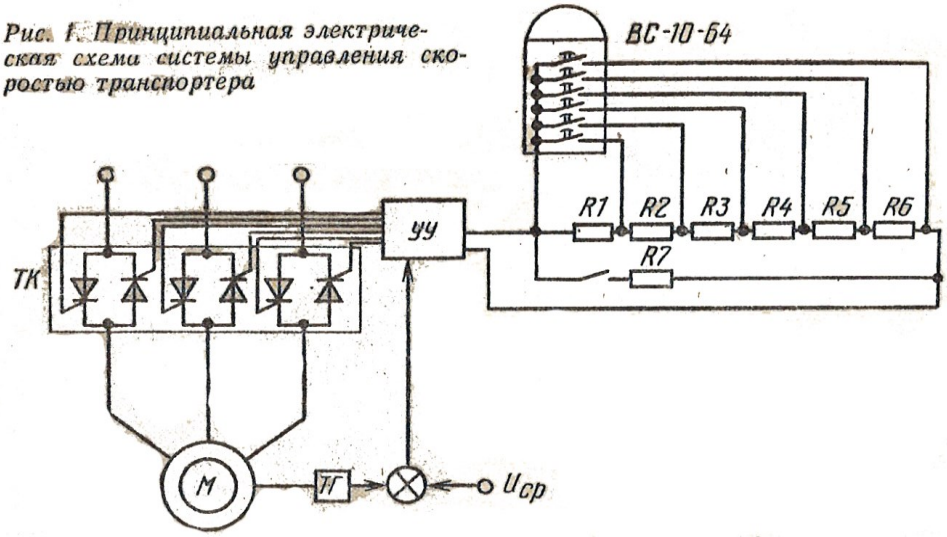

Рис. 1. Принципиальная электрическая схема системы управления скоростью транспортёра

Тиристорный электропривод состоит из тиристорного коммутатора (ТК) и устройства управления (УУ). В коммутатор входит три пары тиристоров с защитными RC цепочками, включённых встречно-параллельно. Устройство управления работает по схеме фазового управления. Устойчивая работа привода обеспечивается обратной связью по скорости. ИП скорости служит тахогенератор (ТГ), с которого снимается напряжение обратной связи $U_{o\,c}$. Сигнал управления U_y=$U_{c\,p}$ - $U_{o\,c}$ поступает с УУ ($U_{\text{ср}}$ – напряжение сравнения). Частота вращения двигателя, а соответственно и скорость транспортера регулируются изменением сопротивления, которое находится в УУ. Когда реле времени по заданной программе замыкает свои контакты, изменяется задающее сопротивление, и двигатель автоматически переходит на другую ступень частоты вращения. При этом R1=R2=R3=R4=R5=R6=R7=100 Ом, резистор R7 установлен для шунтирование регулируемых сопротивлений. Такой регулируемых сопротивлений. Такой регулируемый электропривод прошёл испытания в комплексе «ВОРОНОВО», Отметим, что его можно применить и для регулирования скорости транспортера в зависимости от возраста откармливаемых животных.

На рис. 2 представлен график дискретного изменения скорости транспортера во время раздачи. Графики распределения и получения корма животным с 1 м (рис 3) показывают, что при программном управлении неравномерность дозы составляет +7 … - 3%, что соответствует зоотехническим требованиям.

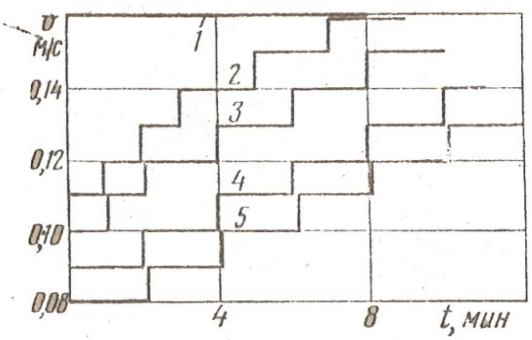

Рис. 2. Зависимость скорости v транспортера от времени раздачи корма при длительности $t_ц$ цикла раздачи, равной 8 мин (1), 9 (2), 10 (3), 11 (4) и 12 мин (5)

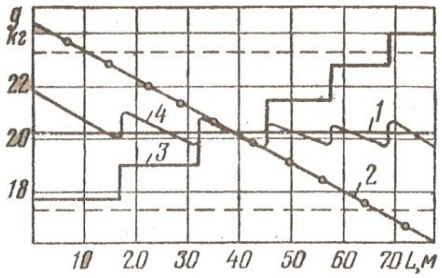

Рис. 3. График распределения (1, 3) и получения корма животными (2, 4) без регулирования скорости транспортера (1, 2) и при регулировании (3, 4) по длине L линии кормления ($t_ц = 12$ мин, штриховые линии соответствуют допустимому отклонению дозы корма от заданной)

Выводы:

1.Скребковые транспортёры- кормораздатчики получили широкое распростронение на животноводческих фермах и комплексах как за рубежом так и у нас.

2.Разработана система программного управления скоростью скребкового кормораздатчика с тиристорным регулируемым электроприводом обеспечивающая зоотехнической требования на раздачи корма животным

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ЗАМОНАВИЙ ТЕХНОЛОГИЯЛАРНИ ҚЎЛЛАШ АСОСИДА ЛАНДШАФТ КАРТАЛАРНИ ЯРАТИШ УСУЛЛАРИ

Аннотация: *Мақолада, ижтимоий-иқтисодий соҳаларда мавжуд бўлган бир қатор асосий топографик ва мавзули карталар бир неча ўн йил олдин чоп этилган бўлиб, улардаги маълумотлар эскириб кетган ва ўз маъносини йўқотган. Янги замон талабларига мос кадастр карталарини яратишда биз дистанцион зондлаш маълумотлари асосида шакллантирилган маълумотлардан фойдаланишимиз зарур.*

Калит сўзлар: *Фотограмметрия, дистанцион зондлаш, рақамли карталар, ландшафт карталар.*

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METHODS OF CREATING LANDSCAPE MAPS USING MODERN TECHNOLOGIES

Abstract: *The article argues that a number of basic topographic and thematic maps in socio-economic areas were published several decades ago, and the information in them is outdated and has lost its meaning. When creating cadastral maps that meet the requirements of the new era, we need to use data generated on the basis of remote sensing data.*

Key words: *Photogrammetry, remote sensing, digital maps, landscape maps.*

Бугунги кундаги мавжуд қишлоқ хўжалиги ерлари электрон ахборот тизими орқали маълумотлар олиш талабга жавоб бермайди. Замонавий ва тезкор ер ҳисобини юритиш усули бу ГАТ дастурлари ёрдамида жойларнинг тахлилини олиб бориш ҳисобланади. Ўзбекистон Республикасида мавжуд бўлган бир қатор асосий топографик ва мавзули карталар бир неча ўн йил олдин чоп этилган булиб, улардаги маълумотлар эскириб кетган ва ўз маъносини йўқотган. Янги замон талабларига мос кадастр карталарини яратишда биз дистансион зондлаш маълумотлари асосида шакллантирилган маълумотлардан фойдаландик. Янги тузилган электрон ва рақамли карталарнинг афзалликлари шундаки, картани тузиш жараёнида қўйилган айрим хатоликларни тузатиш хеч қандай муаммони келтирмайди ва кўп вақт талаб этмайди.

Ландшафт карталарнинг миқдорий моделларини яратишда тузилмаларни мураккаб тизимлар сифатида, улар асосида сунъий йўлдош

тасвирларидан фойдаланган ҳолда ландшафт ҳудудларини геоахборот хариталаш усулларини ишлаб чиқиш ва ландшафт ГИС доирасида амалий масалаларни ечиш учун ландшафт харитасини қўллаш.

Ушбу мақсадга эришиш учун қуйидаги вазифалар ҳал этилади:

1) ландшафт карталарнинг структуравий ва миқдорий моделларини шакллантириш комплекслар мураккаб тизимлар сифатида;

2) чегараларни ажратиб кўрсатиш ва турли даражадаги турли иерархик даражадаги ландшафт комплексларининг типологик боғлиқлигини аниқлаш учун сунъий йўлдош тасвирларини миқдорий таҳлил қилиш усулларини ишлаб чиқиш ва амалга ошириш тасвирлар ва ҳудудлар;

3) топологик даражадаги ландшафт комплексларининг моделларини қуриш ва улар асосида асосий ҳудуднинг ландшафт-типологик харитасини тузиш;

4) ландшафт ГИС дан восита сифатида фойдаланиш усулларини ишлаб чиқиш ердан фойдаланишни баҳолаш ва режалаштириш.

Харитани яратишда ГИС технологиялари оптимал ташкил этиш имконини беради дала тадқиқотлари, ўз ичига олган фазовий маълумотлар базасини яратиш ҳудуднинг ландшафт комплексларини тавсифловчи ҳудуд маълумотлари ва унинг асосида ландшафт комплексларининг чегараларини автоматлаштирилган аниқлаш ва уларни типлаштириш алгоритмларини шакллантириш ва улардан фойдаланиш мумкин.

Ландшафт карталарни янгилаш жараёни асосан масофадан зондлаш материаллари негизида бажарилади. Масофадан олинган маълумотларни қайта ишлаб ГАТ дастурларига юкланади ҳамда мавжуд карта билан устма уст туширилиши натижасида содир бўлган ўзгаришлар ёққол кўзга ташланади. Агарда картада мавжуд объектлар суратда йўқ бўлса ёки уни акси бўлса, масофадан зандлаш материалларига мосланади. Шу тариқа ўзгаришлар даражасига қараб карталар янгиланиб борилади.

Юқоридаги усуллардан фойдаланиб электрон рақамли хариталар яратиш ишлари олиб борилмоқда. Карта ёки атласнинг программаси (дастури) лойихалашнинг негизидир. Бу жараён қуйидагиларни ўз ичига олади: карта тузиладиган худуднинг номи, кимлар учун мўлжалланганлиги, картографик тури, типи, карта ва атласларнинг мавзулари, математик асоси, карталар мазмуни, генерализация принциплари, тасвирлаш усуллари ва шакллари, статистик ва картографик манбалар, улардан фойдаланиш тартиби хамда карта ёки атласни тайёрлаш технологияси.

Топографик карталар яратишда шартли белгиларни танлаш ва жойида ишлата билиш керак. Шартли белгилар оддий шаклда, мазмунга лойиқ танланиши зарур, шу билан бирга хозирги замон технологиясига мос бўлиши керак. Топографик карта тузишда легенданинг ахамияти каттадир, шунинг учун хам легенда картанинг калити деб хам юритилади. Чунки, у карта мазмунини очиб беради. Картани ўқишдан илгари унинг легендаси билан танишилади. Легенда ишлаб чиқишда шартли белгилар карта мазмунига мос бўлибгина колмасдан, мантик жихатдан хам тўлиқ, содда, ўкилиши осон ва

қисқа бўлиши зарур.

Картографияда ArcGIS дастурида сўнги йилларда бир-бири билан чамбарчас боғланиб бораётган билимлар сохаларидир. Бугунги кунда картографлар ArcGIS дастурида картографик моделлар яратмокдалар. ArcGIS дастурида бажарадиган омиллар хар бир худуд учун алохида ахамиятга эга бўлган ягона жараённи амалга оширади. У маълум бир лойиха учун воқеа ва ходисанинг талабларга мувофик равишда хосил қилинган фазовий моделидир.

Бунинг учун ArcGISнинг бирламчи манбаи хисобланган фазовий маълумотларни тахлил қилиш, уларга тааллуқли бўлган атрибутларни (ўзига хос белги, хусусият) тўплаш ва ArcGIS маълумотлар базаси қатламларини яратиш кўп вақт ва мехнат талаб қилади. Фазовий маълумотларни тасвирлаш ва тахлил қилиш ArcGIS маълумотларни базаси қатламларининг ўлчашларини ва маълумотлари сўровини ўз ичига олади.

География ахборот тизимлари кўплаб тармоқларни худудий ташкил этиш режаларини ишлаб чиқишда ўз самарасини кўрсатмокда ва бу, ўз навбатида, хариталар яратишда мухим бўлган муаммолар ечимини ўз вақтида аниқлаш хамда картографияни ривожланишига катта ёрдам беради.

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ВОПРОСЫ РАЗВИТИЯ ТЕХНОЛОГИЧЕСКИХ КОМПЕТЕНЦИЙ У БУДУЩИХ УЧИТЕЛЕЙ ТЕХНОЛОГИИ В СИСТЕМЕ ВЫСШЕГО ОБРАЗОВАНИЯ

Аннотация: *В статье рассматриваются ключевые аспекты развития технологических компетенций у будущих учителей технологии в системе высшего образования. Обоснована необходимость обновления содержания педагогической подготовки, внедрения цифровых образовательных ресурсов, развития проектной деятельности и взаимодействия с индустриальными партнерами. Акцент сделан на практикоориентированный подход и цифровизацию образовательного процесса. Также обсуждаются методы диагностики уровня сформированности компетенций. Сделан вывод о необходимости комплексной модернизации образовательной системы для подготовки конкурентоспособных педагогов, способных эффективно использовать современные технологии в обучении.*

Ключевые слова: *технологические компетенции, учитель технологии, цифровизация, высшее образование, педагогическая подготовка, ИКТ, проектное обучение.*

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ISSUES OF DEVELOPING TECHNOLOGICAL COMPETENCES IN FUTURE TECHNOLOGY TEACHERS IN THE HIGHER EDUCATION SYSTEM

Abstract: *The article discusses the key aspects of developing technological competencies in future technology teachers in the higher education system. The need to update the content of pedagogical training, introduce digital educational resources, develop project activities and interact with industrial partners is substantiated. The emphasis is on a practice-oriented approach and digitalization of the educational process. Methods for diagnosing the level of competence development are also discussed. A conclusion is made about the need for a*

comprehensive modernization of the educational system to prepare competitive teachers who are able to effectively use modern technologies in teaching.

Keywords: *technological competencies, technology teacher, digitalization, higher education, pedagogical training, ICT, project-based learning.*

Современная система высшего педагогического образования сталкивается с необходимостью пересмотра приоритетов в подготовке будущих специалистов. Особенно это касается учителей технологии, которые в условиях стремительного научно-технического прогресса обязаны не просто обладать базовыми профессиональными знаниями, но и быть технологически грамотными, способными использовать современные инструменты, цифровые ресурсы и педагогические инновации в образовательном процессе. Развитие технологических компетенций у будущих учителей технологии становится неотъемлемым условием их успешной профессиональной деятельности, что делает данную проблему одной из актуальнейших в педагогической теории и практике.

Технологические компетенции представляют собой совокупность знаний, умений, навыков и личностных качеств, позволяющих эффективно использовать информационно-коммуникационные технологии, цифровые образовательные ресурсы, технические средства обучения, а также адаптироваться к быстро меняющейся технологической среде. Формирование таких компетенций у будущих учителей технологии требует системного подхода, охватывающего все аспекты образовательной подготовки – теоретическую, практическую и методическую составляющие.

Один из ключевых факторов, определяющих успешность развития технологических компетенций, — это модернизация содержания учебных дисциплин. Учебные планы подготовки учителей технологии должны включать актуальные темы, связанные с цифровыми технологиями, инновационным оборудованием, автоматизацией производственных процессов, основами робототехники, 3D-моделированием, проектной деятельностью, программированием и основами инженерного мышления. Однако на практике часто наблюдается несоответствие между содержанием подготовки и требованиями времени: изучаются устаревшие технологии, не учитываются современные тенденции в образовании, отсутствует возможность работы с актуальным техническим оборудованием.

Еще одним важным направлением в развитии технологических компетенций выступает практикаориентированное обучение. Теоретические знания без возможности применения на практике утрачивают свою ценность. Следовательно, необходимо обеспечить будущее поколение учителей возможностью проходить стажировки и практики в образовательных учреждениях, оснащённых современными техническими средствами, участвовать в научно-исследовательской и проектной деятельности, работать в междисциплинарных командах над реальными инженерными задачами. Кроме того, преподавание профильных дисциплин должно сопровождаться

активным использованием лабораторий, мастерских, учебных комплексов, виртуальных симуляторов и обучающих платформ.

Важную роль в формировании технологических компетенций играет уровень цифровой грамотности самих преподавателей вузов. Образовательный процесс должен строиться на принципах цифровизации, однако, если преподаватель не владеет современными средствами ИКТ, не использует образовательные платформы, не практикует элементы смешанного или дистанционного обучения, то он не в состоянии стать примером и наставником в области технологий для своих студентов. Поэтому в системе повышения квалификации вузовских преподавателей необходим акцент на развитие цифровых и методических компетенций, позволяющих эффективно преподавать современные технологические дисциплины.

Развитие технологических компетенций также тесно связано с формированием у студентов мотивации к саморазвитию, исследовательской деятельности и критическому мышлению. Образовательная среда должна быть стимулирующей, побуждающей к самостоятельному поиску информации, проектированию и разработке технических решений, участию в конкурсах, хакатонах, олимпиадах, связанных с инженерным и техническим творчеством. Такой подход способствует не только овладению технологиями, но и воспитанию профессиональной ответственности, инициативности, креативности, что особенно важно для будущих педагогов.

Важным аспектом становится и использование цифровых образовательных ресурсов (ЦОР) и онлайн-платформ. Такие ресурсы как Moodle, Google Classroom, Khan Academy, Arduino Education, Tinkercad и другие могут использоваться как для самостоятельного освоения технологических навыков, так и в рамках учебного процесса. Например, курсы по основам программирования, основам работы с микроконтроллерами, 3D-моделированию или использованию лазерного оборудования могут быть включены в образовательную программу. Более того, необходимо учить студентов самостоятельно создавать ЦОР, что не только развивает их технические умения, но и способствует формированию методических компетенций.

Нельзя игнорировать и роль проектной деятельности в формировании технологических компетенций. Проекты в области создания обучающих устройств, умных решений для школы, внедрения STEAM-методик в образование позволяют будущим учителям технологии осваивать весь цикл проектирования – от идеи до реализации и презентации. Это особенно актуально в контексте современных педагогических трендов, направленных на формирование метапредметных умений и навыков у школьников.

Формирование технологических компетенций должно рассматриваться и в контексте устойчивого развития. В условиях экологического кризиса будущие учителя технологии должны уметь формировать у школьников представление о бережном отношении к природе, рациональном использовании ресурсов, утилизации отходов, альтернативной энергетике и

экологически чистых технологиях. Следовательно, и в их подготовке необходимо учитывать экологический компонент, знакомить с технологиями устойчивого производства, развивать экологическое сознание.

Еще один ключевой момент — взаимодействие с работодателями и представителями индустрии. Будущие учителя технологии должны быть в курсе потребностей современной школы, требований работодателей и тенденций рынка труда. Для этого необходимо развитие сетевого взаимодействия вузов с учреждениями общего и профессионального образования, промышленными предприятиями, инновационными центрами, что позволит создавать эффективную модель подготовки, ориентированную на реальные профессиональные задачи.

Следует также отметить значимость внедрения системы оценки и диагностики уровня технологических компетенций. В процессе подготовки будущих учителей технологии важно не только формировать знания и навыки, но и регулярно проверять их освоение, фиксировать динамику роста, выявлять пробелы. Для этого могут использоваться как традиционные методы контроля, так и цифровые средства диагностики – онлайн-тесты, практические задания с элементами самопроверки, портфолио проектов, рефлексивные эссе.

Таким образом, развитие технологических компетенций у будущих учителей технологии — это сложный и многоаспектный процесс, требующий согласованных усилий со стороны государственных структур, вузов, преподавателей и самих студентов. В условиях цифровой трансформации образования именно технологически подготовленный учитель способен стать проводником новых знаний, вдохновителем учеников и носителем инновационного педагогического опыта. Он должен не только уметь работать с современными технологиями, но и понимать их педагогический потенциал, уметь интегрировать в учебный процесс с учетом возрастных, психолого-педагогических особенностей школьников, а также особенностей конкретной образовательной среды.

Именно поэтому реформирование содержания педагогического образования, усиление практической подготовки, цифровизация учебного процесса, повышение квалификации преподавателей, развитие исследовательской и проектной деятельности, а также внедрение новых подходов к оценке компетенций должны стать приоритетами в модернизации высшего образования. Только в этом случае можно обеспечить высококачественную подготовку учителей технологии, способных эффективно работать в условиях цифрового общества и формировать у школьников навыки, необходимые для жизни и деятельности в XXI веке.

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ЭКОНОМЕТРИЧЕСКИЙ АНАЛИЗ И ПРОГНОЗИРОВАНИЕ ЭКОНОМИЧЕСКИХ ПОКАЗАТЕЛЕЙ РЕСПУБЛИКИ УЗБЕКИСТАН

Аннотация: *В данной статье проведен комплексный эконометрический анализ основных макроэкономических показателей экономики Республики Узбекистан за период 2010–2024 годов, включая валовой внутренний продукт (ВВП), объем инвестиций и численность занятого населения. Также в исследовании с использованием модели множественной линейной регрессии определены факторы, влияющие на экономический рост, и оценена степень их воздействия на ВВП на основе статистических критериев. На основе полученной модели разработаны прогнозы на 2025–2027 годы.*

Ключевые слова: *валовой внутренний продукт, инвестиции, занятость, эконометрический анализ, регрессионная модель, экономическое прогнозирование, экономика Узбекистана, макроэкономические показатели, статистика.*

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ECONOMETRIC ANALYSIS AND FORECASTING OF ECONOMIC INDICATORS OF THE REPUBLIC OF UZBEKISTAN

Abstract: *This article conducts a comprehensive econometric analysis of the main macroeconomic indicators of the Republic of Uzbekistan's economy for the period 2010–2024, including gross domestic product (GDP), investment volume, and the size of the employed population. The study also uses a multiple linear regression model to identify factors influencing economic growth and assesses their impact on GDP based on statistical criteria. Based on the developed model, forecasts for 2025–2027 have been formulated.*

Keywords: *gross domestic product, investments, employment, econometric analysis, regression model, economic forecasting, Uzbekistan's economy, macroeconomic indicators, statistics.*

Экономическая деятельность является чрезвычайно сложным процессом, на каждом этапе которого возникают различные специфические проблемы. Решение этих проблем требует проведения специализированных

экономических исследований. При этом каждый экономический объект или процесс должен рассматриваться как сложная система. Для определения будущих перспектив такой системы недостаточно использовать простые методы. В качестве таких методов важное значение имеют эконометрические модели, то есть математические и статистические методы для анализа и прогнозирования экономических процессов.

На сегодняшний день эффективное проведение экономической политики в нашей стране и изучение уровня макроэкономических показателей во многом зависят от прогнозирования с использованием эконометрических методов.

Эффективность управления экономическими процессами опирается на экономический анализ, точность данных и надежность экономического прогнозирования. С этой точки зрения экономическое прогнозирование позволяет планировать национальную экономику, определять направления развития, оценивать потенциальные экономические риски, эффективно распределять ресурсы и целенаправленно формировать экономическую политику государства.

Учитывая сложную структуру экономических процессов, их моделирование и прогнозирование их будущего состояния являются актуальными задачами.

Методология

В исследовании проведен эконометрический анализ на основе основных макроэкономических показателей экономики Республики Узбекистан за 2010–2024 годы. В данном разделе описаны научные основы исследования, примененные методы и параметры модели.

Обсуждение и результаты

В условиях современного развития анализ динамики макроэкономических показателей и прогнозирование их будущего состояния являются важными для принятия эффективных управленческих решений. Сложность и многофакторность экономических процессов требуют глубокого анализа с использованием современных эконометрических моделей. В частности, с помощью эконометрического моделирования изучаются изменения ВВП, объема экспорта, численности занятых в экономике и объема инвестиций, а также их взаимосвязь.

В результате социально-экономических реформ в Республике Узбекистан за 2010–2024 годы макроэкономические показатели значительно изменились. Поэтому проведение комплексного эконометрического анализа на основе статистических данных за этот период, определение степени влияния факторов экономического роста и формирование научных выводов для долгосрочного стратегического планирования имеют важное научно-практическое значение.

В данной статье изучены взаимосвязи между основными экономическими показателями Узбекистана за 2010–2024 годы — ВВП (Y), объемом инвестиций (X_1), численностью занятых в экономике (X_2) и объемом

инвестиций (X_3) — с использованием эконометрического моделирования. Построены линейные множественные регрессионные модели, определены основные факторы, влияющие на экономический рост, что позволяет принимать научно обоснованные решения в экономической политике.

Таблица 1.

Динамика экономических показателей Узбекистана за 2010–2024 годы

Годы	ВВП, млрд сум	Объем инвестиций, млрд сум, X_1	Занятые в экономике, тыс. чел., X_2
2010	78936,6	16463,7	11628,4
2011	103232,6	19500	11919,1
2012	127590,2	24455,3	12223,8
2013	153311,3	30490,1	12523,3
2014	186829,5	37646,2	12818,4
2015	221350,9	44810,4	13058,3
2016	255421,9	51232	13298,4
2017	356453,8	72155,2	13520,3
2018	473652,8	124231,3	13273,1
2019	594659,6	195927,3	13541,1
2020	668038	210195,1	13236,4
2021	820536,6	239552,6	13538,9
2022	995573,1	266240	13706,2
2023	1204485	356071,4	14014,2
2024	1454574	493700	14260

Если рассмотреть сущность эндогенной переменной и экзогенных факторов, влияющих на нее, то в качестве факторов воздействия были выбраны показатели, отражающие объем инвестиций в экономику страны и численность занятых в экономике.

Степень парной корреляционной зависимости между ВВП и влияющими на него факторами была изучена на основе корреляционного анализа. Результаты показали, что плотность связи между эндогенной переменной и факторами воздействия удовлетворяет необходимому условию: $r_{yx1} = 0{,}9914$, $r_{yx2} = 0{,}8422$. Высокие значения коэффициентов корреляции свидетельствуют о сильной связи и правильности выбора факторов воздействия.

Таблица 2.
Корреляционная связь между ВВП и влияющими факторами в Республике Узбекистан

Показатели	ВВП, млрд сум	Объем инвестиций, млрд сум	Численность занятых, тыс. чел.
ВВП, млрд сум	1		
Объем инвестиций, млрд сум	0,991471	1	
Численность занятых, тыс. чел.	0,842219	0,809709	1
Объем инвестиций, млрд сум	0,668965	0,695748	0,636703

С использованием программного пакета EViews10 проведен регрессионный анализ, в ходе которого определены параметры модели, а ее значимость оценена на основе основных критериев, рассчитанных программой. Коэффициенты регрессионной модели для рассматриваемого случая были выделены следующим образом:

$$\boldsymbol{Y = 2,7x_1 + 66,003x_2 - 744823}$$

Интерпретация регрессионного уравнения показывает, что при неизменных прочих факторах увеличение объема инвестиций на 1 млрд сум приводит к росту ВВП на 2,7 млрд сум, а увеличение численности занятых на 1000 человек — к росту ВВП на 66,003 млрд сум.

Надежность и адекватность построенной модели и ее параметров проверены на основе нескольких критериев, что подтвердило ее соответствие требованиям и достоверность результатов.

С использованием множественной эконометрической модели разработаны краткосрочные прогнозы ВВП и влияющих на него факторов на 2025–2027 годы.

Таблица 3.

Прогноз экономических показателей Узбекистана на 2025–2027 годы

Показатели	Модель	2025	2026	2027
ВВП, млрд сум, Y	$Y = 2{,}7x_1 + 66{,}003x_2 - 744823$	1237323	1327869	1418414
Объем инвестиций, млрд сум, X_1	$X_1 = 91578{,}22 + 29636{,}2 * t$	382601	412237,2	441873,4
Численность занятых, тыс. чел., X_2	$X_2 = 11827{,}98 + 159{,}5018 * t$	14380,01	14539,51	14699,01

На основе эконометрического анализа макроэкономических показателей за 2010–2024 годы можно сделать вывод, что основными факторами, наиболее сильно влияющими на объем ВВП, являются объем инвестиций в основной капитал и численность занятых в экономике.

Рисунок 1. Прогноз ВВП Республики Узбекистан на 2025–2027 годы

Результаты прогноза на 2025–2027 годы подтверждают устойчивость экономического роста, что свидетельствует о результативности проводимых в стране структурных реформ и их влиянии на экономический рост.

Выводы и предложения

Многие современные научные исследования подчеркивают, что экономическое прогнозирование рассматривается как инструмент обеспечения благосостояния населения и социальной стабильности в стране, а его использование в формировании экономической политики государства является важным.

Для реализации экономического прогнозирования необходимо анализировать взаимосвязи между переменными с использованием научно обоснованных моделей и прогнозировать будущее на их основе.

Экономическое прогнозирование должно учитывать не только статистические методы, но и социально-экономическую среду страны. Этот подход имеет важное значение для разработки экономических прогнозов в формировании экономической политики Узбекистана, а интеграция структурных реформ в прогнозные модели целесообразна.

Для дальнейшего устойчивого экономического развития страны предлагаются следующие меры:

- активизация инвестиций в экономику и улучшение их качественного состава (направление инвестиций на производство продукции с высокой добавленной стоимостью);

- повышение качества рабочей силы и уровня занятости (развитие профессионального образования, повышение квалификации рабочей силы, создание новых рабочих мест);
- улучшение инвестиционной среды;
- усиление научных подходов в экономической политике государства (эффективное использование эконометрических методов в планировании и принятии решений, определение макроэкономических показателей на основе прогнозов);
- усиление регионального экономического анализа и прогнозирования (разработка сценариев развития для каждого региона с использованием регрессионных моделей);
- укрепление сотрудничества с научными центрами и высшими учебными заведениями (реализация совместных проектов и принятие управленческих решений на основе эконометрического анализа).

Экономические прогнозы имеют важное практическое значение для планирования экономической политики Узбекистана, формирования инвестиционных стратегий и решения проблем занятости, обеспечивая научно обоснованное принятие решений.

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ОТДАЛЕННЫЕ РЕЗУЛЬТАТЫ ОПЕРАТИВНОГО ЛЕЧЕНИЯ ВРОЖДЕННОГО ВЫВИХА БЕДРА

Резюме. *Актуальность. В настоящее время, несмотря на значительный прогресс, достигнутый в области раннего выявления и консервативного лечения врожденных вывихов бедра, большое количество пациентов с этой патологией остаются без своевременного лечения. При врожденном вывихе бедра, 10-15% пациентов, леченных консервативным методом, требуют оперативного лечения.*

Исследование. Заключается в изучении причин осложнений, наблюдаемых при длительном курсе лечения пациентов, получавших лечение методом хирургического вмешательства на врожденный вывиха бедра, и поиске мер их профилактики.В таких случаях, в зависимости от возраста пациентов и степени тяжести врожденного вывиха бедра, хирургические операции проводятся до восстановления и вправления проксимальной части бедренной кости и вертлужной впадины.В статье приведены результаты более чем 30-летнего лечения врожденных пороков развития у 111 детей хирургическим методом.Хорошие результаты наблюдались у 22 (28,9%) пациентов, удовлетворительные - у 31 (40,8%), плохие - у 23 (30,3%) пациентов. Были изучены причины осложнений после лечения и меры по их предотвращения у пациентов с результатами, которые были признаны плохими.

Ключевые слова: *Врожденный вывих, восстановление, коксартроз, ограничение движений, анкилоз.*

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REMOTE RESULTS OF SURGICAL TREATMENT OF CONGENITAL HIP DISLOCATION

Abstract. *Relevance. At present, although significant progress has been made in the field of early detection of congenital malformations and conservative treatment, a large number of patients with this pathology remain untreated in a timely manner. In 10-15% of patients treated conservatively with congenital malformations of the thighs, the need for surgical treatment arises.*

Purpose of the study. It consists of studying the causes of complications observed during long periods of treatment of patients treated surgically on congenital malformations of the thighs and looking for measures to prevent them. In such cases, depending on the age of the patients and the severity of the discharge, surgical procedures are performed, ranging from simple open placement to repair and opening of the proximal part of the femur and the roof of the joint.This article presents the results of surgical treatment performed for 111 children with congenital hip dislocation. After 30 years, the long term results of the intervention were studied in 76 (68.5%) patients. According to observation, 22(28.9%) patients and 31(40.8%) patients demonstrated good and satisfactory long term results respectively. While results of surgical treatment for 23(30.3%) patients estimated as unsatisfactory. Identified the causes of unsatisfactory results and preventive measures were recommended.

Keywords: *congenital hip dislocation, reconstruction, contracture, coxarthrosis, ankylosis.*

Актуальность. Врожденный вывих бедра является одной из актуальных проблем детской ортопедии, занимающей первое место среди ортопедических заболеваний и по количеству опубликованных научных работ [1,3,7]

В настоящее время, несмотря на значительный прогресс, достигнутый в области раннего выявления и консервативного лечения врожденных вывихов бедра, большое количество пациентов с этой патологией остаются без своевременного лечения. При врожденном вывихе бедра, 10-15% пациентов, леченных консервативным методом, требуют оперативного лечения. [2].

В новейшей литературе отмечается наличие группы врожденных вывихов бедра, которые не поддаются консервативному лечению, такие обзоры показали, что в разной литературе таковых от 1-5% до 10-20% [6].

В таких случаях, в зависимости от возраста пациентов и тяжести заболевания, выполняются хирургические процедуры, начиная от простого открытого вправления и заканчивая восстановлением и размещением проксимальной части бедренной кости в вертлужной впадине.

Изучение результатов такого лечения в ближайшей перспективе освещалось во многих литературных источниках, но результаты, наблюдаемые в долгосрочной перспективе, не были должным образом показаны.

Цель работы.Она заключается в изучении причин осложнений, наблюдавшихся в течение длительного (30 лет) периода лечения пациентов, лечившихся методом хирургического вмешательства бедер, и в поиске мер их профилактики.

Материалы и методы исследования. В отделении детской ортопедии областной больницы ортопедии и травматологии наблюдалось 310 (47,8%) пациентов, лечившихся в 1988 году с врожденным вывихом бедра. Из них 111 (17,1%) были пролечены методом хирургического вмешательства.

Ретроспективное исследование пациентов, пролеченных хирургическим методом. 10 (9%) пациентов были мальчиками, 101 (91%) - девочками. В соответствии с их возрастом число лиц в возрасте от 2 до 5 лет составило 27 (24,3%), лиц в возрасте от 5 до 8 лет - 73 (65,7%), а лиц старше 8 лет - 11 (9.9%). У 39 (35,2%) пациентов был правосторонний вывих, у 55 (49,5%) - левосторонний и у 17 (15,3%) был двухсторонний врожденный вывих бедра.

Пациенты, до операции и после операции, были осмотрены педиатором, также до операции были сделаны клизмы.

После специальной подготовки пациентов, под интубационной анестезией, согласно инструкции, были выполнены следующие операции: открытое вправление головки бедра у 5 (4,5%) пациентов, реконструкция и вправление проксимальной части бедренной кости у 58 (52,2%) пациентов, реконструкция верхнего края вертлужной впадины с образованием навеса у 6 (5,4%) пациентов, реконструкция и вправление проксимальной части бедренной кости и реконструкция верхнего края вертлужной впадины с образованием навеса 34 (30,6%) у пациентов, реконструктивные операции без вскрытия сустава 8 (7,2%) у пациентов.

После операции, в зависимости от сложности проведенной операции, накладывались гипсовые повязки от 4 недель до 6-7 недель. У пациентов осложнения, связанные с хирургическим вмешательством, на ранних стадиях (шок, вторичное кровотечение, пневмония, повторный вывих, нагноение гематомы), не наблюдались. Операционные раны закрывались первичным натяжением. После снятия гипсовых повязок были проведены физиотерапевтические процедуры, лечебная гимнастика, массажные процедуры с целью восстановления умеренной подвижности в тазобедренном

суставе. Через 2,5-3 месяца начинали учить ходить с помощью костылей, опираясь на здоровую ногу. Через год разрешали опираться на прооперированную ногу.

Результаты лечения в ближайшей перспективе оцениваются как хорошие. После завершения процесса лечения в больнице родителям пациентов было рекомендовано: обследоваться у ортопеда 2 раза в год до окончания процесса роста ребенка, быть освобожденными от занятий физкультуры в школе, ограничить работу, выполняемую стоя на ногах, выбрать профессию, которая не требует этого.

Еще в 1961 году Scaglietti O., Calandriello B. предупреждали и написали следующее: "Ошибочно смотреть на ближайшие результаты, как на гарантию хорошего отдаленного результата, при успешном открытии и вправлении врожденного вывиха бедра. Также в ходе операции один за другим исправляется только полость сустава с головкой бедра. Необходимо создать условия для правильного развития головки и суставной полости бедра при патологических изменениях."

Результаты лечения: были изучены результаты операций, проведенных у 76 (68,5%) пациентов через 30 лет после завершения лечения, в 2018 году. На момент обследования пациентам было 35-42 года. 68 (89,5%) из них составляли женщины, 8 (10,5%) - мужчины. Методы компьютерной томографии использовались для пациентов в зависимости от клинических, рентгенологических и показаний.

Результаты лечения были оценены как хорошие, удовлетворительные и неудовлетворительные.

Результат как хороший, оценивался тем, что у 22 (28,9%) пациентов не было жалоб, ходили самостоятельно и правильно, движения в тазобедренном суставе выполняли свободно и полностью во всех направлениях, длина ног одинакова. Развитие мышц бедер происходит одинаково. Рентгеновские индикаторы: головки имеют сферическую форму, головка центрирована в полости сустава, угол раскрытия шейки составлял 120-125°. Линия Шентона не нарушена, угол Виберга составлял около 20-25°, в начале бедра и на вертлужной впадине обнаружен небольшой субхондральный склероз.

Эти пациенты поступили на лечение в возрасте 3-5 лет, была проведена хирургическая операция по восстановлению и размещению проксимальной части бедренной кости и проксимальной части бедра, они своевременно пришли на профилактический осмотр, регулярно проводили ортопедические консультации.

Приведем пример. Пациент Б., 35 лет, врожденный вывих правого бедра в возрасте 3 лет 6 месяцев, мальчик в 1988 году лечился хирургическим путем. В период после операции пациента регулярно привозили вовремя родителями. Пациент регулярно получал физиофункциональное лечение в течение 6 месяцев после операции.

31 (40,8%) пациент, результаты которых были признаны не удовлетворительными, жаловались на усталость и появление легкой боли в

тазобедренном суставе в конце дня. Оперированная сторона и мышцы бедер с этой стороны слегка атрофированы (примерно 1-1,5 см). Ноги слегка ротированы внутрь, отведение ограничено примерно на 15-20°. Пациенты работают по своей профессии. Рентгенологические показатели: головки бедер сферической формы, расположены в суставной полости, линия Шентона разорвана, на рентгенограмме пациентов определяется I степень коксартроза. Угол Виберга составляет около 18-20°. Эти пациенты получали лечение в возрасте 5-8 лет. Простое открытое вправление бедра в 5 случаях, в 18 случаев реконструктивная операция проксимального отдела бедра с открытым вправлением. Эти пациенты регулярно не появлялись на ортопедическом обследовании и не получали профилактического лечения.

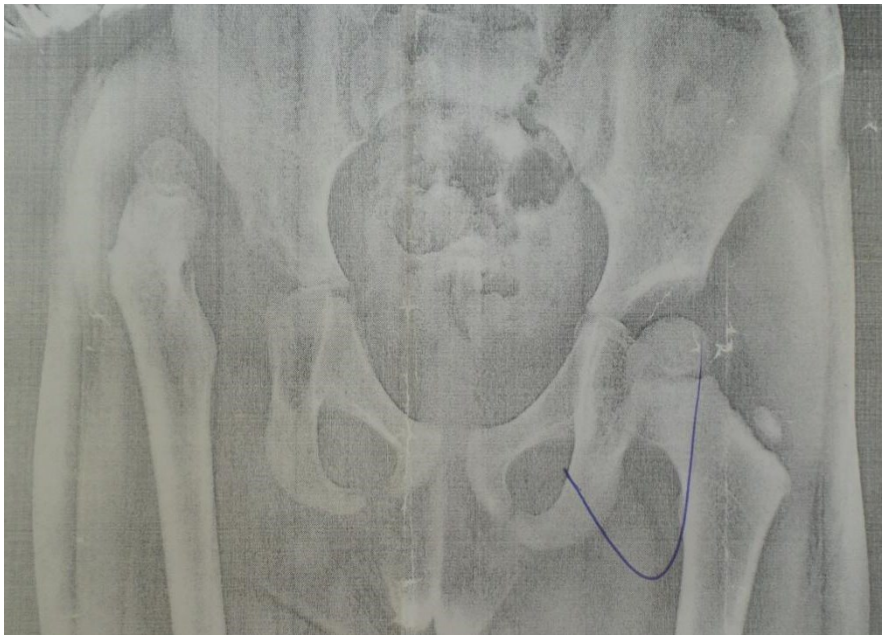

Рисунок №1. Пациент Б., 3 года 6 месяцев. Рентгенография в прямой проекции. Диагностическая рентгенография.

Операция "Подвертельная остеотомия правого бедра.Остеотомия подвздошной кости по Солтеру". После 6 ти месяцев были удалены металлические фиксаторы.

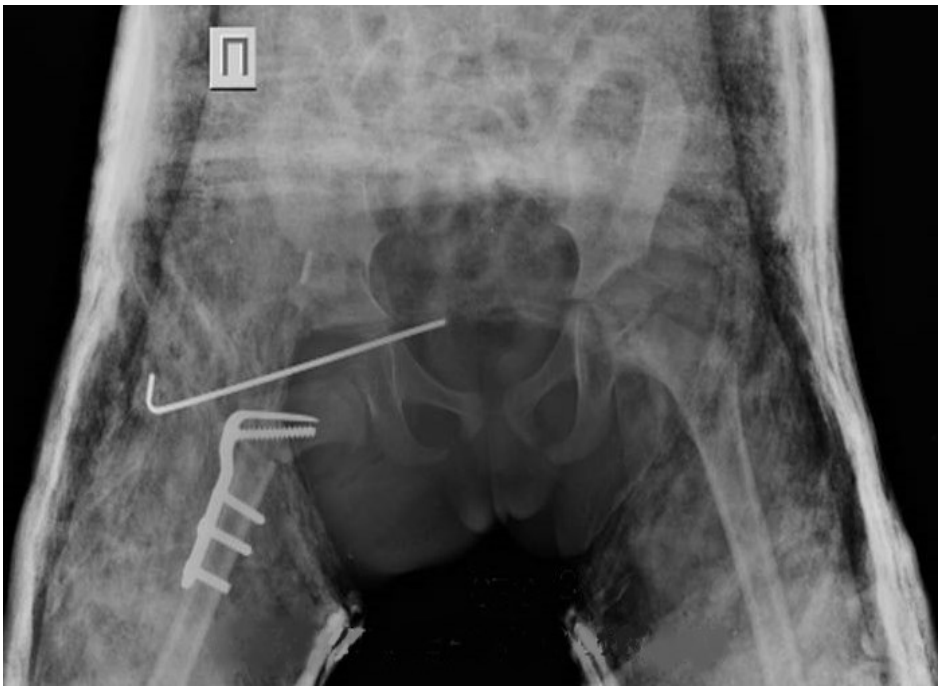

Рисунок №2. Пациент Б., 3 года 6 месяцев. Рентгеновский снимок в прямой проекции. Результат через 1 месяц после операции (пациент находится в гипсе).

Рисунок №3. Пациент Б., 4 года. Рентгеновский снимок в прямой проекции. Результат через 6 месяцев после операции (до снятия металлических фиксаторов).

Рисунок №4. Пациент Б., 5 лет 4 месяца. Рентгеновский снимок. Прямая проекция. Результат через 1 год 8 месяцев после операции.

Продолжительность лечения составляла один год 8 месяцев. Ближайший результат лечения в был признан хорошим.

Рисунок №5. Пациент Б., 35 лет. Рентгеновский снимок в прямой проекции. Результат через 30 лет после операции.

Результаты, которые были признаны неудовлетворительными, были зафиксированы в 23 (30,3%) случаях. Эти пациенты постоянно чувствуют боль в прооперированном суставе, пациенты ограничены в объеме движений в прооперированном суставе. У 4 пациентов определяется отсутствие движений в суставах (анкилоз). У 8 пациентов наблюдались симптомы коксартроза II-III степени. 7 пациентов с инвалидностью II группы, 4 пациентам была проведена операция по эндопротезированию и 6 пациентам была предложена операция по эндопротезированию.

Эти пациенты были направлены на лечение хирургическим методом в возрасте 8 лет и старше, у 12 из них на тот момент, уже были симптомы коксартроза. После оперативного вмешательства не соблюдали ортопедический режим, позже, много работали: на стройке, в хлопководстве, за границей. Ни разу не получали профилактического лечения. В 6 случаях женщины рожали 3-5 детей.

Приведем пример.

Пациенту А.Л., 39 лет, в возрасте 8 лет, с врожденным вывихом правого бедра и подвывихом левого бедра, проведено оперативное вмешательство.

Рисунок №6. Пациент А.Л., 8 лет. Рентгеновский снимок в прямой проекции. Диагностическая рентгенография.

Была проведена операция "реконструкция крыши вертлужной впадины по Пембертону, с открытым простым вправлением правого тазо-бедренного сустава". По истечению шести месяцев после первой операции была проведена операция "корегирующая остеотомия левого бедра, с реконструкцией крыши крыши вертлужной впадины по Пембертону". Еще через шесть месяцев были удалены металлические фиксаторы.

Рисунок №7. Пациент А.Л., 8 лет 6 месяцев.

Рентгеновский снимок прямая проекция. Результат через 6 месяцев после операции.

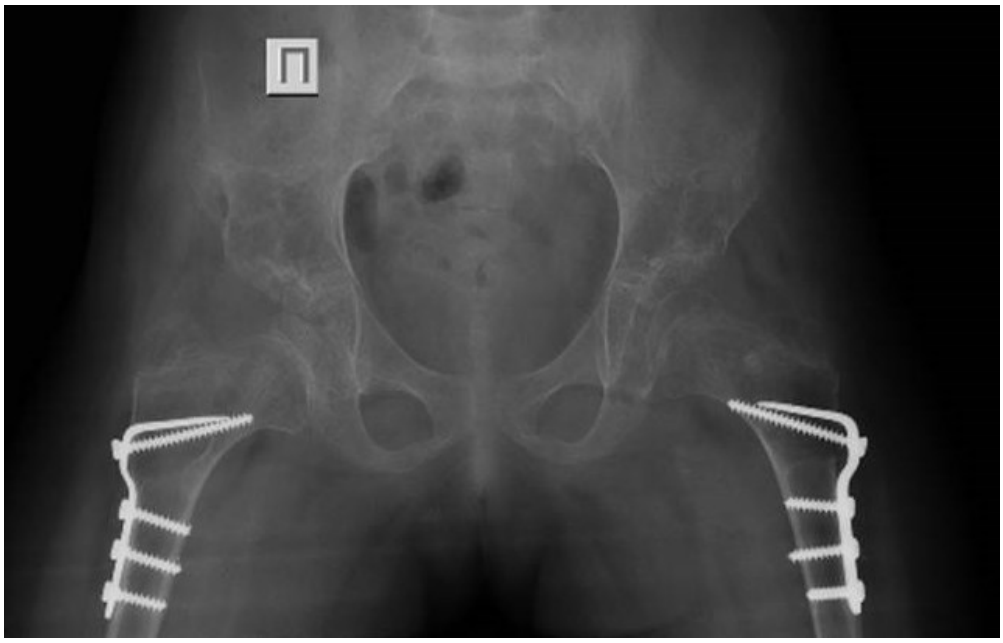

Рисунок №8. Пациент А.Л., 9 лет. Рентгеновский снимок прямая проекция. Результат через 1 год после операции.

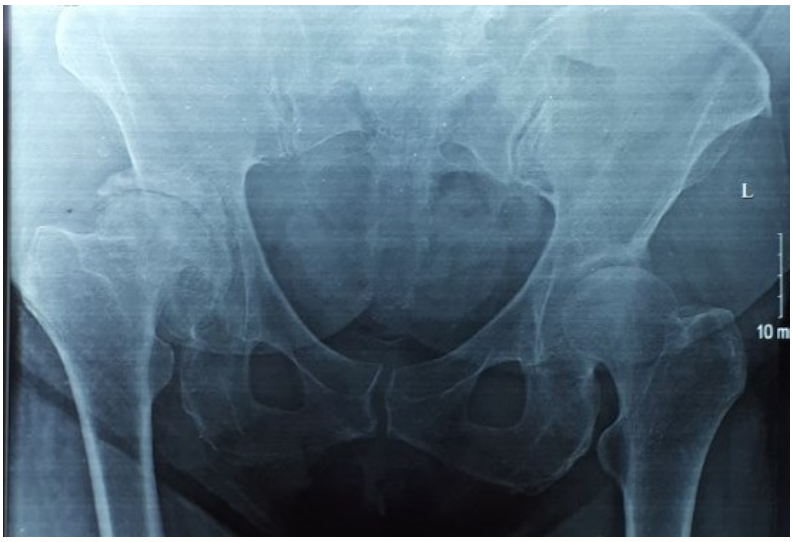

Рисунок №9. Пациент А.Л., 39 лет. Рентгеновский снимок в прямой проекции. Результат через 30 лет после операции. У больного двусторонний диспластический коксартроз. Справа III степени, слева II степени". Пациенту была рекомендована операция эндопротезирование.

Вывод:Врожденный вывих бедра является распространенным ортопедическим заболеванием органов опорно-двигательного аппарата. По нашим наблюдениям, эта патология составляет 47,8% больных детей, проходящих лечение в стационарных условиях. Из проведенного исследования было установлено, что наблюдение только хороших результатов клинических испытаний у 22 (28,9%) пациентов, пролеченных хирургическим методом, еще раз показывает, что это заболевание стоит лечить с момента родов.

Можно добиться ожидаемо хороших результатов, если пациенты, проходящие лечение с этой патологией, будут наблюдаться и периодически лежать в диспансере до тех пор, пока не прекратится их рост.

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ДИФФЕРЕНЦИАЛЬНОЕ ИСЧИСЛЕНИЕ И ЕГО ПРИМЕНЕНИЕ В ЗАДАЧАХ ЭКОНОМИЧЕСКОЙ ОПТИМИЗАЦИИ

Аннотация: *При изучении разных материальных процессов, например, движения, хода химических реакций, расширения тел и других, а также экономических процессов, например спроса, издержек, национального дохода, мы встречаемся с задачей определения скорости изменений соответствующих величин. В большинстве случаев такие задачи не могут быть решены с помощью элементарной математики. Чтобы легче решать их, необходимо воспользоваться дифференциальным исчислением.*

Ключевые слова: *производная, сложная функция, дифференцирование, экономические задачи и решения с помощью производных и её применение в реальной жизни.*

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THE APPLICATION OF DERIVATIVES IN SOLVING ECONOMIC OPTIMIZATION PROBLEMS

Abstract*: This article explores the concept and computational techniques of derivatives, emphasizing their essential role in analyzing both physical and economic processes. The derivative is introduced through its fundamental definition and illustrated with examples ranging from constant and linear functions to polynomial and composite functions. Special attention is given to differentiation*

rules, including the product and quotient rules, as well as the chain rule for composite functions. The practical application of derivatives is demonstrated through economic models that focus on maximizing profit, optimizing taxation, and determining production efficiency. These real-world examples highlight how differential calculus is crucial for decision-making in economics and business. The paper aims to enhance the reader's understanding of how mathematical tools can be used effectively in analyzing and solving optimization problems in applied contexts.

***Keywords**: derivative, composite function, differentiation, economic optimization, real-life application, profit maximization, tax modeling, calculus in economics*

Понятие производной. Допустим, что определена функция y = f(x). Возьмем определенное значение независимой переменной xo и значение xo +▲x (▲x называется приращением независимой переменной; оно может быть положительным или отрицательным). Значение функции в точке xo составляет Xo, а значение функции в точке Xo + ▲x составляет (Xo + ▲x). Приращению независимой переменной ▲x соответствует, таким образом, приращение зависимой переменной:

▲y=f(Xo+▲x)-f(Xo)

Частное

$$\frac{\blacktriangle y}{\blacktriangle x} = \frac{f(Xo + \blacktriangle x) - f(Xo)}{\blacktriangle x}$$

т. е. результат деления приращения зависимой переменной на приращение независимой переменной, называется *дифференциальным отношением.*

Если при ▲x→0 существует предел дифференциального отношения, то этот предел называется производной функции y = f(x) в точке Xo

Производная функция y= f(x) обозначается символом

y', f' (x), $\frac{dy}{dx}$ или $\frac{df(x)}{dx}$

Следовательно,

$$y'=f'(x) = \frac{dy}{dx} = \lim_{\blacktriangle x \to 0} \frac{\blacktriangle y}{\blacktriangle x} = \lim_{\blacktriangle x \to 0} \frac{f(Xo+\blacktriangle x)-f(Xo)}{\blacktriangle x}$$

Теперь посмотрим примеры, как вычисляется производная.

Пример 1. Вычислить производную функции

y=c, где c – постоянная.

Допустим , что приращение независимой переменной есть ▲x. Соответствующее приращение зависимой переменной составляет :

▲y=f(x+▲x)-f(x)=c-c=0 ,

Следовательно , дифференциальное отношение равно:

$\frac{\blacktriangle y}{\blacktriangle x}=\frac{0}{\blacktriangle x}=0$,

Отсюда

$\lim_{\blacktriangle x\to 0} \frac{\blacktriangle y}{\blacktriangle x}$ =0 , или же

если y=c, то y' = 0

Пример 1. Вычислить производную функции

y=x

Допустим , что приращение независимой переменной есть ▲x. Соответствующее приращение зависимой переменной составляет :

▲y= f(x+▲x)-f(x)=x+▲x-x=▲x

Следовательно , дифференциальное отношение равно:

$\frac{\blacktriangle y}{\blacktriangle x}=\frac{\blacktriangle x}{\blacktriangle x}=1$

Это значит что $\lim_{\blacktriangle x\to 0} \frac{\blacktriangle y}{\blacktriangle x} = \lim_{\blacktriangle x\to 0} 1 = 1$

То есть y' = 1

Теперь посмотрим на более сложный пример , где нужно вычислить производную функции:

$y=x^3$

Точно также найдём ▲y и дифференциальное отношение:

▲y= f(x+▲x)-f(x)= $(x+\blacktriangle x)^3 - x^3 = 3x^2 \blacktriangle x + 3x(\blacktriangle x)^2 + (\blacktriangle x)^3$

$\frac{\blacktriangle y}{\blacktriangle x}=\frac{3x^2\blacktriangle x+3x(\blacktriangle x)^2+(\blacktriangle x)^3}{\blacktriangle x}=3x^2 + 3x\blacktriangle x + (\blacktriangle x)^2$

Отсюда $\lim_{\blacktriangle x\to 0} \frac{\blacktriangle y}{\blacktriangle x}$

$= \lim_{\blacktriangle x\to 0} (3x^2 + 3x\blacktriangle x + (\blacktriangle x)^2) = 3x^2$

или же $y'=3x^2$.

ТЕОРЕМА. Если f(x) и g(x) — две функции, имеющие в точке x производные f'(x) и g'(x) соответственно, то производная суммы и разности этих функций равна суммы и разности их производных, т. е, если

F(x)=f(x)+g(x) , то F'(x)= f'(x)+g'(x)

F(x)=f(x)-g(x) , то F'(x)= f'(x)-g'(x)

Например: Если дана функция

f(x)= $3x^2 - 2x^3$+x-1 ,

то f'(x)=6x-$6x^2 + 1$

На основании определения производной и правил дифференцирования можно составить таблицу производных основных элементарных функций:

1. $c' = 0,\ c = \text{const}$
2. $\left(x^n\right)' = nx^{n-1}$
3. $\left(a^x\right)' = a^x \cdot \ln a$
4. $\left(e^x\right)' = e^x$
5. $\left(\log_a x\right)' = \dfrac{1}{x \ln a}$
6. $\left(\ln x\right)' = \dfrac{1}{x}$
7. $\left(\sin x\right)' = \cos x$
8. $\left(\cos x\right)' = -\sin x$
9. $\left(\sqrt{x}\right)' = \dfrac{1}{2\sqrt{x}}$
10. $\left(\text{tg}x\right)' = \dfrac{1}{\cos^2 x}$
11. $\left(\text{ctg}x\right)' = -\dfrac{1}{\sin^2 x}$
12. $\left(\arcsin x\right)' = \dfrac{1}{\sqrt{1-x^2}}$
13. $\left(\arccos x\right)' = -\dfrac{1}{\sqrt{1-x^2}}$
14. $\left(\text{arctg}x\right)' = \dfrac{1}{1+x^2}$
15. $\left(\text{arcctg}x\right)' = -\dfrac{1}{1+x^2}$
16. $\left(\text{sh}\, x\right)' = \text{ch}\, x$
17. $\left(\text{ch}\, x\right)' = \text{sh}\, x$
18. $\left(\text{th}\, x\right)' = \dfrac{1}{\text{ch}^2 x}$
19. $\left(\text{th}\, x\right)' = -\dfrac{1}{\text{sh}^2 x}$

Производная сложной функции

Сложная функция – это функция, полученная путём вложения одной функции в другую. Формально, если есть две функции:

*$f(x)$ – внешняя функция,

*$g(x)$ – внутренняя функция,

то их композиция записывается как:

h(x)=f(g(x)) и называется сложной функцией.

Для того чтобы вычислить производную сложной функции y=f(g(x)), нужно умножить производную внутренней функции на производную внешней функции=≫

h'(x)=(f(g(x))'=f'(g(x))· g'(x)

Например:

Пусть

·f(y)=y^2

·g(x)=2x+3, то h(x)=$(2x+3)^2$, а её производная вычисляется по формуле :

h'(x)=f'(g(x))· $g'(x)$

1.g(x)=2x+3 , тогда $g'(y)=2$

2. f(y)= y^2 , тогда $f'(y)=2y$, а значит f'(g(x))=2(2x+3)

3. Итоговая производная:

h'(x)= 2(2x+3) ·2=8x+12

Производная произведения и частного

*Пусть даны 2 сложные функции **U=f(x) и V=g(x)**. Для нахождения производной произведения этих функций используется формула:

(U· V)'=U'·V+U·V'

Пример: нужно найти производную функции y=x^2 · sinx.

Если u=x^2 , то u'= 2x

Аналогично v=sinx, то v'=cosx

из формулы произведения сверху следует что →

y'=(x^2 · sinx) '=2x·sinx+x^2 · cosx.

*Пусть даны 2 сложные функции **U=f(x) и V=g(x)**. Для нахождения производной частного этих функций используется формула:

$(\frac{U}{V})' = \frac{U' \cdot V - U \cdot V'}{V^2}$

Пример: нужно найти производную функции y=$\frac{x^3}{x^2+1}$.

Если u=x^3 , то u'= $3x^2$

Аналогично v=$x^2 + 1$, то v'=2x

из формулы частного показанного сверху следует что →

y'=$(\frac{x^3}{x^2+1})' = \frac{3x^2(x^2+1) - x^3 \cdot 2x}{(x^2+1)^2} = \frac{x^4+3x^2}{(x^2+1)^2}$

Экономическая задача

Задача №1. Максимизация прибыли. Пусть функция дохода от количества реализованного товара x выражается формулой R(x)=$\frac{x^3}{3} + 2000000x$, а функция затрат на производство товара - формулой C(x)=$1500x^2$. Определить оптимальный уровень производства и прибыль, которая при этом достигается.

Решение

Прибыль определяется формулой

П(x)= $\frac{x^3}{3} - 1500x^2 + 2000000x$.

Приравнивая производную прибыли

П'(x)= x^2-3000x+2000000

нулью, получаем уравнение

x^2-3000x+2000000=0

Корни этого уравнения $x_1 = 1000, x_2 = 2000$. Проверка показывает, что максимальная прибыль достигается при x = 1000 :

$П_{max} = П(1000) \approx 833333333 ден.ед.$

Оптимизация прибыли. Пусть функция дохода от количества реализованного товара x выражается формулой R(x)=16x, а функция затрат на производство товара – формулой C(x)= $2x^2$+1. Определить оптимальный уровень производства и прибыль, которая при этом достигается.

Решение

Прибыль определяется формулой

П(x)=R(x)-C(x)

Откуда П(x)=16x-$2x^2$-1.

Приравнивая производную прибыли П'(x)=16-4x нулью, получаем x=4. Проверка показывает, что эта точка является точкой максимума. Таким образом, оптимальный уровень производства x = 4. При этом значении максимальная прибыль составит

$П_{max} = 31$.

Оптимизация налогообложения предприятий. Пусть, как и в предыдущем примере, функция дохода от количества реализованного товара x выражается формулой R(x)=16x-x^2, а функция затрат на производство товара – формулой C(x)= x^2+1. Определить оптимальный уровень налога с единицы реализованного товара и прибыль предприятия, которая при этом достигается.

Решение

Пусть t (tax) налог с единицы выпускаемой продукции. Тогда общий налог с x единиц продукции составит T=tx. В этом случае функция прибыли будет иметь вид

П(x)=R(x)-C(x)-tx.

Требуется определить: каким должен быть налог t , чтобы величина суммарного налога T со всей продукции была наибольшей?

Поскольку R(x)=16x-x^2, а C(x)= x^2+1, то прибыли имеет вид

П(x)=16x-2x^2-tx-1.

Как и в предыдущем примере, условие максимума прибыли П'(x)=0; отсюда получаем значение x , максимизирующего прибыль с учетом пока неизвестного налога t :

16-4x-t=0, x=4-$\frac{t}{4}$.

Подставим полученное значение объема продукции в величину суммарного налога T = tx. Получим

T = t(4-$\frac{t}{4}$).

Найдем теперь условия, при которых величина T будет максимальной:

T=t(4-$\frac{t}{4}$), T'(t)=0, $\Rightarrow$ t=8.

Далее, при t=8 имеем x=4- $\frac{t}{4}$= 4- $\frac{8}{4}$ = 2. Отсюда следует, что при налоге t = 8 максимальная величина прибыли достигается при x = 2:

$П_{max}$ =П(2)=16×2-2× 2^2-8× 2-1=7,

а оптимальный (с точки зрения налоговой службы) сбор налога

T = t(4- $\frac{t}{4}$) = 8(4- $\frac{8}{4}$) = 16.

Интересно сопоставить эти цифры (x=2 , $П_{max} = 7$) с цифрами при отсутствии налогообложения. При t = 0 решение задачи на максимизацию прибыли дало следующие результат (см.предыдущий пример): x = 4, $П_{max} =$ 31.

Вывод: уменьшение налогообложения стимулирует рост выпуска продукции и приводит при этом к увеличению прибыли от ее реализации.

Понятно, почему производители прикладывают столько усилий, чтобы снизить ставку налога.

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ВЛИЯНИЕ ПЕРЕРЕЗКИ ДИАФРАГМАЛЬНЫХ НЕРВОВ НА СОСТОЯНИЕ ВНУТРИОРГАННОЙ ЛИМФАТИЧЕСКОЙ СИСТЕМЫ ТОЛСТОЙ КИШКИ БЕЛОЙ КРЫСЫ

Резюме: *В статье изучены влияние перерезки диафрагмальных нервов на состояние внутриорганной лимфатической системы толстой кишки белой крысы. Выявленные нами закономерности полиморфной картины внутриорганной лимфатической системы ободочной и прямой кишки белой крысы после выключения движений диафрагмы могут явиться обоснованием ее структурных приспособлений к различным степеням лимфостаза.*

Ключевые слова: *белой крысы, лимфатические сосуды, движений диафрагмы, толстой кишки, крупные лакуны.*

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INFLUENCE OF CUTTING THE DIAPHRAGM NERVES ON THE STATE OF THE INTRAORGAN LYMPHATIC SYSTEM OF THE COLON OF A WHITE RAT

Abstract: *The article studies the effect of cutting the phrenic nerves on the state of the intraorgan lymphatic system of the colon of a white rat. The patterns of the polymorphic picture of the intraorgan lymphatic system of the colon and rectum of a white rat that we identified after turning off the diaphragm movements can serve as a basis for its structural adaptations to various degrees of lymphostasis.*

Keywords: *white rats, lymphatic vessels, diaphragm movements, colon, large lacunae.*

Ввдение. В морфологии успешно развивается эволюционное направление. С его позиции нам представляется актуальным рассмотрение аспектов лимфообращения, установление компонентов его регуляции периферической нервной системой опосредованно - через соматическую мускулатуру [1,4]. К настоящему времени известно несколько механизмов влияния дыхательных движений диафрагмы на поддержание лимфотока. Динамическое наблюдение за развитием моторно-эвакуаторной дисфункции

кишечника во взаимосвязи с лимфоидной и лимфатической системами требует новых подходов к реабилитации подобных состояний [2,3]. Несмотря на столь широкое распространение и многочисленные исследования, остаются во многом не изученными особенности морфологических проявлений нарушения моторно-эвакуаторной функции толстой кишки, лежащие в основе клинической картины различных вариантов заболевания [5,8]. Лимфатическая система участвует в поддержании постоянства внутренней среды организма, той микросреды, которая окружает клетку и обеспечивает пластические, энергетические и выделительные возможности последней. При этом роль лимфатической системы может быть сформулирована как дренажно-детоксикационная [6,7]. Анализ доступной нам литературы свидетельствует о недостаточной изученности анатомо-гистологического строения толстой кишки и его связи с регионарными лимфатическими узлами с учетом изменения перистальтики и выявления коррелятивных связей между органо- и гистометрическими показателями.

Цель исследования. Нами были изучено влияние перерезки диафрагмальных нервов на состояние внутриорганной лимфатической системы толстой кишки белой крысы.

Материалы и методы исследования. Для исследования состояния внутриорганной лимфатической системы органов брюшной полости и таза вследствие-прекращения ритмических экскурсии диафрагмы, мы производили двухстороннее иссечение участков (1,5-2,0 мл) диафрагмальных нервов на шее у 20 белых крыс. Последние забивались через 5-20 суток после операции. Инъецировалась лимфатическая система ободочной и прямой кишки экспериментальных и контрольных животных; приготовлялись, просветленные макромикроскопические препараты.

Результаты исследования. Анализируя полученные результаты, мы установили, что в норме (контрольная группа) в лимфатической системе начального и конечного отделов толстой кишки белой крысы отмечается корреляционная зависимость ее морфологических данных с особенностями строения стенок этого органа. Так, в восходящей ободочной кишке по ходу ее пальмовидных складок располагаются трехмерные сети лимфатических капилляров (диаметр - 0,03-0,045 мм) слизисто - подслизистой оболочки. Двухмерные сети лимфатических капилляров этого же слоя в нисходящей ободочной и прямой кишке определенной ориентации не имеют. Отводящие лимфатические сосуды переходного типа, образующие на всем протяжении сплетения, формируют собирательные лимфатические сосуды, оттекающие от подсерозного слоя у брыжеечного края кишки. В ранние сроки после операции (5-7) дней) в ободочной и прямой кишке белой крысы- во всех слоях ее стенки наблюдаются деструктивные изменения, характеризующиеся появлением массовых перетяжек (диаметр лимфатических капилляров в местах расширений равен 0,08 - 0,1 мм, в участках сужений - 0,012 - 0,015 мм). В начальном отделе толстой кишки встречаются крупные лакуны, сконцентрированные при впадении лимфатических капилляров в

лимфатические сосуды подслизистого слоя. Лимфатическое русло конечного отдела толстой кишки характеризуется появлением новых элементов на стенках лимфатических капилляров в виде слепых выростов булавовидной и конусовидной формы (диаметр - 0,03 - 0,045 мм). В более поздние сроки после операции (10-20 дней) наростают склеротические изменения лимфатических капилляров и сосудов толстой кишки, наиболее рельефно выраженные в подслизистом слое ее конечного отдела.

Вывод. Выявленные нами закономерности полиморфной картины внутриорганной лимфатической системы ободочной и прямой кишки белой крысы после выключения движений диафрагмы могут явиться обоснованием ее структурных приспособлений к различным степеням лимфостаза.

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ПУТИ ПОВЫШЕНИЯ ЭФФЕКТИВНОСТИ БАРАБАННЫХ ХЛОПКООЧИСТИТЕЛЬНЫХ МАШИН ПРИ ПЕРВИЧНОЙ ОБРАБОТКЕ ХЛОПКА

Аннотация: *В статье анализируются технологические и конструктивные подходы, направленные на повышение эффективности работы барабанных джинов, используемых при первичной переработке хлопка. Приведены практические расчеты и результаты экспериментов по энергозатратам, силам трения, уровню качества волокнистой продукции и объему образующихся отходов в процессе очистки хлопка. По результатам исследования установлено, что выбор оптимального диапазона скоростей вращения барабана, согласование зазора между зубчатым барабаном и сепараторами, а также использование рабочих поверхностей с тефлоновым покрытием позволяют повысить производительность машины на 12–15%. Также отмечено, что внедрение автоматизированных систем управления обеспечивает стабильность производства при сохранении качества хлопкового волокна.*

Ключевые слова: *Хлопковая промышленность, джин, барабанный джин, эффективность, переработка хлопка, энергосбережение, волокнистый продукт, технологический подход, автоматизация, инновационный дизайн.*

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WAYS TO INCREASE THE EFFICIENCY OF DRUM COTTON CLEANING MACHINES IN PRIMARY PROCESSING OF COTTON

Abstract: *The article analyzes technological and design approaches aimed at increasing the efficiency of drum jeans, the consequences of primary processing. When conducting practical calculations and experimental results on energy consumption, friction force, quality of fibrous products and the volume of waste generated during the cleaning process are completed. According to the results of the study, it was found that the choice of the microphone speed synchronization mode, the coordination of the gap between the toothed drum and separators, as well as the use of working surfaces with a Teflon coating can increase the machine's productivity by 12-15%. It is also noted that the introduction of automated control systems ensures the stability of production while maintaining the quality of cotton fiber.*

Keywords: *Cotton industry, gin, drum gin, efficiency, processing results, energy saving, fibrous product, technological approach, automation, innovative design.*

Введение

Хлопковая промышленность является одной из ведущих отраслей экономики Узбекистана, а цепочка выращивания хлопка, его первичной обработки и превращения в готовый продукт состоит из взаимосвязанных технологических стадий. В этой цепочке первичная обработка хлопка, в частности, джинирование, служит основным технологическим звеном. С помощью джинов из хлопка-сырца извлекается волокно, имеющее большое значение как готовое сырье для текстильной промышленности. Именно на этом этапе определяется себестоимость урожая, качество волокнистого продукта и эффективность производства.

Согласно экспериментам, при переработке действующих джинов в среднем повреждается 15–18% волокон, что отрицательно сказывается на разрывности, длине и эластичности хлопковых волокон. В результате высокого трения на рабочих поверхностях машины (особенно поверхностях барабана и сепаратора) наблюдается перегрев материала, разрыв волокон и пылеобразование. Это не только снижает качество продукта, но и сокращает срок службы машины. Причинами этого можно назвать наличие металлических поверхностей основных подвижных частей, чрезмерную скорость вращения барабана, недостаточную работу систем охлаждения. С целью повышения эффективности на практике были проверены несколько конструктивных и технологических предложений. В первую очередь, было определено оптимальное расстояние между барабаном и сепаратором в 1,2–1,4 мм, что позволило снизить силу трения при разделении волокон и избежать повреждения волокон. Также эффективность очистки хлопка от хлопка показала самые высокие результаты при поддержании скорости вращения барабана в диапазоне 700–900 об/мин. Напротив, при работе на скоростях выше 1000 об/мин резко возрастал уровень обрыва волокон и пылеобразования.

Другим важным инновационным подходом является внедрение тефлонового покрытия на барабан и рабочие поверхности. Это покрытие позволило снизить трение до 28%, предотвратив прилипание волокна к рабочим поверхностям. Благодаря гладкости тефлонового покрытия количество выделяемого в машине тепла снизилось в среднем на 5–7 °C, что способствовало снижению тепловой нагрузки машины. В ходе 20-часового эксперимента показатель повреждения волокна на джинах с тефлоновым покрытием барабанов снизился до 11,2%, тогда как на машинах с обычными металлическими поверхностями этот показатель составил 16,7%. Эта разница особенно важна при производстве высококачественного волокна.

Кроме того, внедрение автоматизированных систем управления на барабанных джинах также положительно влияет на эффективность. С

помощью датчиков и микроконтроллеров вращение барабана, температура поверхности, уровень вибрации и поток хлопка отслеживаются в режиме реального времени и автоматически регулируются. Эта система позволяет предотвращать сбои в работе машины, оптимизировать потребление энергии и сокращать отходы. В барабанном джине с такой системой потребление энергии снизилось с 9,4 кВт до 7,8 кВт в час, а количество вырабатываемого волокна увеличилось в среднем на 12%.

Экологические подходы также важны из-за избыточного пылеобразования при работе машин, загрязняющего производственную среду. Для этого в барабанные джины были интегрированы пылеулавливающие фильтровальные установки. Эксперименты показали, что в машинах с фильтровальной системой выбросы пыли во внешнюю среду сократились на 60%, что не только улучшает условия труда, но и обеспечивает соблюдение санитарно-гигиенических норм.

Все вышеперечисленные предложения и практические исследования показывают, что для повышения эффективности работы барабанных джинов необходим комплексный подход. Только при комплексном выполнении конструктивных изменений, подбора материалов, автоматизации и охраны окружающей среды сокращаются технические потери при первичной обработке хлопка, снижается энергозатратность и повышается качество продукции.

Заключение

Проведенный анализ и эксперименты показывают, что для повышения эффективности работы барабанных джинов важен комплексный подход. Поддержание скорости вращения барабана в оптимальном диапазоне (700–900 об/мин), согласование расстояния между барабаном и сепаратором, а также введение тефлоновых или других гладких покрытий на рабочие поверхности значительно снижает процент повреждения хлопкового волокна, уменьшает объем отходов, улучшает качество волокна, снижает энергозатраты.

Также, интегрируя автоматизированные системы управления в джины, можно контролировать параметры работы машин в режиме реального времени, предотвращать аварии и обеспечивать стабильность производства. Экспериментальные результаты показывают, что такие меры позволяют повысить производительность машин в среднем на 12–15% и снизить потребление энергии на 15–20%. В заключение следует отметить, что процесс первичной переработки хлопка можно сделать более технически и экономически эффективным за счет модернизации барабанных джинов, оптимизации технологических параметров, обеспечения экологической безопасности и внедрения автоматизации.

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ОПТИМАЛЬНЫЙ ВЫБОР ПОСТАВЩИКОВ МАТЕРИПЛЬНЫХ РЕСУРСОВ НА ОСНОВЕ МЕТОДА АВС-АНАЛИЗА

Аннотация: *В статье рассмотрена методика АВС-анализа как основного инструмента эффективного управления материальными ресурсами. Проанализированы подходы к классификации материальных ресурсов организации. Обосновано* применение метода построения кумулятивной кривой на базе *АВС-классификации. Определена оптимальная группа поставщиков материальных ресурсов для конкретной организации.*

Ключевые слова: *материальные ресурсы, оптимизация, запасы, эффективность, классификация, АВС-анализ, поставщики.*

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OPTIMAL SELECTION OF MATERIAL RESOURCE SUPPLIERS BASED ON THE ABC ANALYSIS METHOD

Abstract: *The article considers the ABC analysis methodology as the main tool for effective management of material resources. Approaches to classifying the organization's material resources are analyzed. The application of the method for constructing a cumulative curve based on the ABC classification is substantiated. The optimal group of material resource suppliers for a specific organization is determined.*

Keywords: *material resources, optimization, stocks, efficiency, classification, ABC analysis, suppliers.*

Оптимизировать уровень запасов в ОАО «Милкавита» возможно при создании системы четкого отбора и обоснованной классификации ресурсов на основе АВС-метода.

АВС-метод является основным инструментом эффективного управления материальными ресурсами, который может применяться практически в любых областях деятельности. [1].

АВС-анализ позволяет классифицировать ресурсы организации по степени их важности. Проведение АВС-классификации включает 3 этапа.

1 этап – выбор критерия классификации – единственный неформализованный шаг. Выбор критерия зависит, прежде всего, от стратегии организации на данном этапе развития. В качестве критериев могут выступать цена закупки, прибыль от продаж, рентабельность продаж, средний уровень запаса различных единицах, доля в созданных запасах, период оборота запаса и т.п.

2 этап включает проведение расчета нарастающего итога значения критерия классификации по номенклатурным позициям.

3 этап – выделение классификационных групп– в классическом АВС-методе проводится на основе закона Парето, утверждающего, что 80% значений качественного критерия определяется 20% количества выбранной совокупности объектов.

Рассмотрим классический порядок проведения АВС-классификации, который представлен в таблице 1 для номенклатуры закупаемых материальных ресурсов ОАО «Милкавита».

Таблица 1 – АВС-классификация закупаемых материальных ресурсов ОАО «Милкавита»

Наименование	Цена, тыс. руб.	Уд. вес, %	Уд. вес нарастающим итогом, %	Группа
1	2	3	4	5
1 Наполнитель фруктовый «Манго - маракуйя»	10190	8,13	8,13	А
2 Наполнитель фруктовый «Клубника»	10185	8,13	16,26	А
3 Наполнитель фруктовый «Груша – мёд – злаки»	10173	8,13	24,39	А
4 Наполнитель фруктовый «Вишня»	10161	8,13	32,52	А
5 Наполнитель фруктовый «Черника»	10138	8,13	40,65	А
6 Закваска	10003	7,75	48,4	А
7 Сыворотка	9876	7,14	55,54	А
8 Фольга упаковочная	8961	7,11	62,65	В
9 Пленка упаковочная	8736	6,6	69,25	В
10 Пластиковый стакан с IML-этикеткой	7654	6,03	75,28	С
11 Пластиковый стакан	6427	6,01	81,29	С
12 Коробка картонная	5321	5,96	87,25	С
13 Пленка БОПП	4325	5,73	92,98	С
14 Полиэтиленовая туба	3258	3,08	96,06	С
15 Пластиковая коробочка	1198	2,03	98,09	С
16 Flow-pack	1058	1,91	100	С
Итого	117664	100,00	-	-

В рассматриваемом случае позиции, имеющие до 80% нарастающего итога критерия классификации отнесены к группе А. В группу В включены позиции, имеющие от 80% до 90% нарастающего итога. Оставшиеся номенклатурные позиции включены в группу С.

Для разделения ресурсов на группы можно применять метод построения кумулятивной кривой (рисунок1).

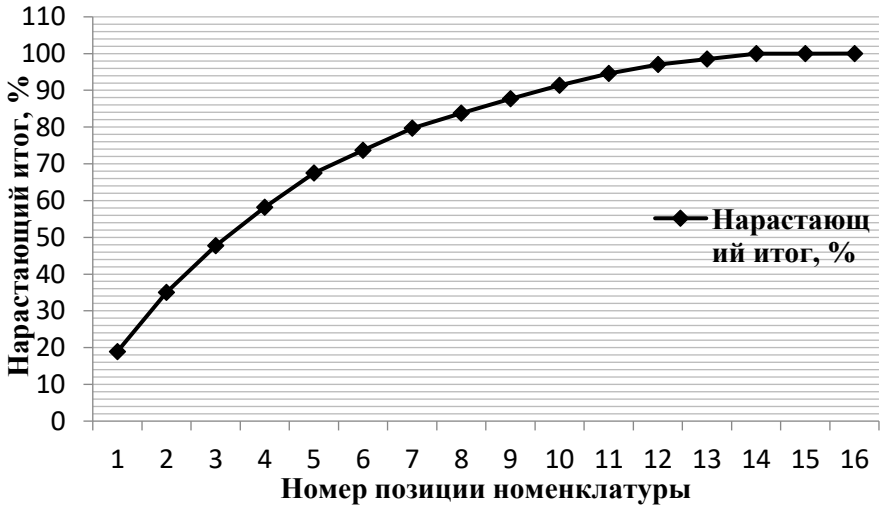

Рисунок 1 – Построение кумулятивной кривой на базе таблицы АВС-классификации

Далее необходимо соединить прямой крайние точки кривой и найти точку касания параллельной полученной прямой линии. Эта точка определит границы группы А (рисунок 2).

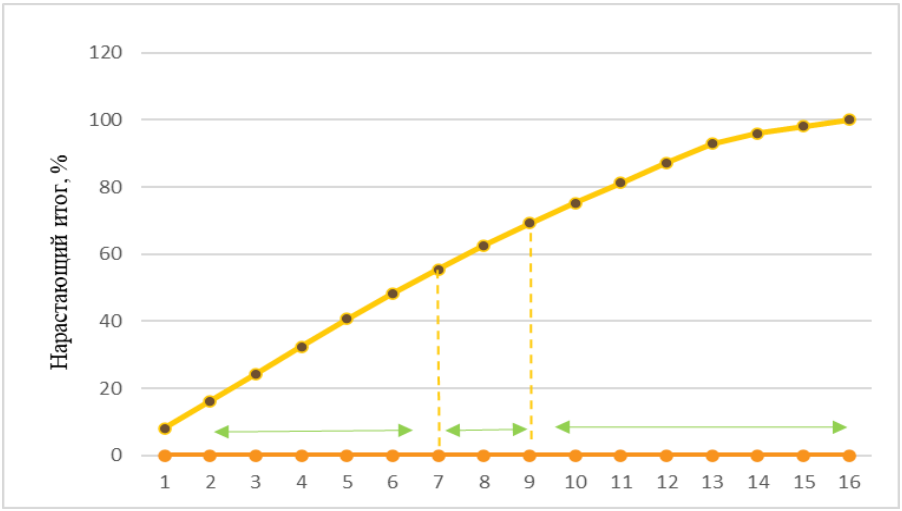

Рисунок 2 – Определение количества и границ групп АВС-классификации

Затем требуется повторить процедуру, соединив прямой начальную и конечную точки оставшейся части кривой, и зафиксировав границы следующей группы. Предлагаемый алгоритм позволяет автоматически

определить границы и количество групп, но не исключает анализа получившейся классификации руководителем или специалистом в целях внесения необходимых корректив.

Применив метод построения кумулятивной кривой для примера 1, видим, что в данном случае, все элементы, попавшие в группу А, В и С - совпадают с предыдущим результатом.

В зависимости от того, к какой группе будет отнесен тот или иной вид материала, рекомендации будут иметь различный характер.

В дальнейшем при помощи использования систем управление запасами ОАО «Милкавита» будет грамотно осуществлять контроль за уровнем материальных ресурсов, оперативно оформлять заказы на их восполнение.

Использованные источники:

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КЫРГЫЗ АКЫНДАРЫНЫН ЧЫГАРМАЛАРЫНДАГЫ МИФОЛОГИЯЛЫК ОБРАЗДАРДЫН ПОЭТИКАЛЫК ЧЕЧМЕЛӨӨСҮ

Анотация: *Бул илимий макалада кыргыз акындарынын поэзиясындагы мифологиялык образдардын поэтикалык чечмелөнүшү терең талдоого алынат. Изилдөөдө Токтогул Сатылганов, Барпы Алыкулов, Эшманбет жана Эсенаман сыяктуу акындардын чыгармаларындагы мифологиялык жана фольклордук элементтердин көркөм чагылдырылышы мисалдар менен көрсөтүлөт. Мифологиялык образдардын акындык ой жүгүртүүгө, эстетикалык мазмунга жана руханий дүйнө таанууга тийгизген таасири чечмеленет. Метафора, салыштыруулар жана элдик образдар аркылуу түзүлгөн көркөм системанын поэтикалык маңызы белгиленип, кыргыз поэзиясындагы архаикалык түшүнүктөрдүн заманбап поэтикалык формалары изилденет. Макала адабият таануу, фольклор жана поэтикалык изилдөөлөр жаатындагы окурмандар үчүн пайдалуу материал болуп саналат.*

Кулуч сөздөр: *кыргыз акындары, мифология, поэзия, фольклор, мифтик образдар, элдик ишенимдер, Токтогул, Барпы, поэтикалык чечмелөө, адабият таануу*

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THE POETIC INTERPRETATION OF MYTHOLOGICAL IMAGES IN THE WORKS OF KYRGYZ POETS

Annotation: *This scientific article explores the poetic interpretation of mythological images in the works of Kyrgyz poets. The study analyzes how mythological and folkloric elements are reflected in the poetry of prominent figures such as Toktogul Satylganov, Barpy Alykulov, Eshmanbet, and Esenaman. It examines the influence of mythical motifs on poetic thinking, aesthetic expression, and spiritual perception. Through examples of metaphors, comparisons, and traditional symbols, the article reveals the poetic system shaped by folklore. The*

research also highlights the artistic and didactic significance of mythological imagery in Kyrgyz literature. This work will be of particular interest to scholars of literary studies, folklore, and poetic discourse analysis.

Keywords: *Kyrgyz poets, Mythology poetic, interpretation, folklore, mythological imagery, traditional beliefs, Toktogul, Barpy, literary analysis, poetic symbolism.*

Кыргыз элинин оозеки чыгармалары — бул улуттук маданияттын, руханий дүйнөнүн жана дүйнө таануунун көчмөн элге таандык формаларынын терең булагы болуп эсептелет. Ар кыл замандарда жаралган уламыштар, жомоктор, элдик ырлар, эпостор жана айтыш өнөрү аркылуу кыргыз эли табиятка, коомго, аалам түзүлүшүнө болгон мамилесин, ишенимин жана турмуштук түшүнүктөрүн чагылдырган. Дал ушундай фольклордук мурастан келип чыккан мифологиялык образдар кыргыз поэзиясында да кеңири орун алган.

Мифология — бул бир элдин руханий баалуулуктарынын, дүйнө таанымдык түшүнүктөрүнүн системасы. Анын поэзиядагы көркөм чагылуусу аркылуу акындар терең философиялык жана эстетикалык ойлорду берет. Кыргыз акындарынын чыгармаларында мифологиялык жана фольклордук элементтер элдин архаикалык түшүнүктөрүн сактоо менен гана чектелбестен, учурдагы маселелерди да камтыйт, символикалык маанини жаратат.

Токтогул Сатылганов, Барпы Алыкулов, Эшманбет, Эсенаман сыяктуу акындардын поэтикалык мурастарында жаратылыш кубулуштары, аруахтар, рухтар, касиеттүү жандыктар жана элдик каармандар аркылуу поэтикалык элестер түзүлүп, бул образдар элдин аң-сезиминдеги терең ишенимдер менен байланышта ачылат.

Бул макаланын максаты — кыргыз акындарынын чыгармаларында колдонулган мифологиялык образдардын мазмундук жана көркөм-функционалдык өзгөчөлүктөрүн изилдөө жана аларды поэтикалык чечмелөө аркылуу коомдук-социалдык жана руханий маанисин ачып берүү. Ошондой эле акындардын фольклордук булактарга болгон кайрылуусунун себептерин жана ал образдардын поэзиядагы эстетикалык жүгүн талдоо максат кылынат.

Кыргыз акындарынын чыгармаларында мифологиялык образдардын поэтикалык чечмелөөсү — бул улуттук дүйнө таанымдын көркөм чагылуусу болуп саналат. Ар кыл доорлордо жаратылган мифтер, уламыштар жана жомоктор элдин руханий аң-сезимин, жашоо образы менен болгон байланыштарын даңазалап келген. Поэзия бул бай мурасты өзүнө сиңирип, акындардын образдар аркылуу берүүчү терең философиялык, социалдык жана эстетикалык маанилеринин негизине айланган.

Кыргыз акындарынын чыгармачылыгында мифологиялык образдар элдин ишеним тутумунун чагылуусу катары кызмат кылат. Бул образдар аркылуу акындар ар кандай идеяларды, турмуштук көйгөйлөрдү, жаратылыш менен болгон байланыштарды символдор аркылуу жеткиришет. Айрыкча, рух, аруах, жин, касиеттүү жан-жаныбарлар, арбактар, табият кубулуштары,

ай жана күн, асман жана жер сыяктуу концепциялар акындык поэзиянын түз өзөгүнө айланган.

Токтогул Сатылгановдун поэзиясында элдик дүйнө тааным жана мифологиялык түшүнүктөр терең чагылдырылган. Анын ырларында табият кубулуштары менен адам турмушунун байланышы мифологиялык символдор аркылуу берилет. Мисалы, "Ай туугандан жарык болот, эл башчысынан - тартип болот" деген саптарда айдын чыгышы табигый процесс катары эмес, руханий символ катары колдонулат. Бул — элдик аң-сезимде ааламдын гармониясы рухий жана коомдук тартип менен бирдикте караларын далилдейт[142].

Барпы Алыкуловдун чыгармачылыгы мифологиялык образдардын молдугу жана алардын поэтикалык чечмелөөсү менен өзгөчөлөнөт. Ал табият менен адамдын өз ара байланышын, рухтар дүйнөсүнүн таасирин, жана эл ишенимдерин ырларында таамай пайдаланат. Мисалы, анын кээ бир ырларында "касиреттүү түн", "кубулган шамал", "асмандан түшкөн үн" сыяктуу элестер арбын кездешет. Бул поэтикалык элементтер мифологиялык дүйнө таанымдын негизинде жаралып, символизм менен байытылат.

Эшманбет жана Эсенаман сыяктуу акындардын чыгармаларында аруахтар жана касиеттүү жаратылыш кубулуштары обон, кайгы, күү менен коштолуп берилет. Алар табияттагы ар бир кубулушту — шамал, суу, ай, чагылган — өзүнчө поэтикалык бирдик катары карап, алардын артында ыйыктык бар экенин көрсөтүшөт. Бул көрүнүш мифологиядагы табият менен рух дүйнөсүнүн ажырагыс байланышынан келип чыгат.

Кыргыз поэзиясындагы мифологиялык образдар адатта салыштыруулар, метафоралар жана элдик формулалар аркылуу ачылат. Мисалы, акындар “караңгы түн” дегенди жамандык же коркунуч менен байланыштырса, “жарык таң” — үмүт, жаңылануу деген түшүнүктү берет. Бул образдар мифологиялык ишенимдер менен тыгыз байланышта турат, себеби байыркы элдер түн — жиндердин, жаман рухтардын учуру, ал эми таң — периштелердин, жакшылык башталган маал деп эсептеген.

Поэзияда мифологиялык образдарды чечмелөө — бул жөн гана сүрөттөө эмес, акындын дүйнө таанымын жана көркөм позициясын билдирген форма. Миф — бул форма эмес, мазмун, идея жана символ. Акын ошол символдор аркылуу элдин менталитетине таандык болгон тарыхый эстеликтерди, салттуу түшүнүктөрдү жана философиялык ойлорду жеткирет[143]. Натыйжада, поэзия — элдин руханий кодун сактап турган тирүү формага айланат.

Мифологиялык образдардын чечмелениши аркылуу акындар мезгилдик, турмуштук жана адеп-ахлактык көйгөйлөрдү көтөрүшөт. Алар мифтик формаларды азыркы замандын көйгөйлөрү менен айкалыштырып, поэзияны жаңылоо максатында колдонушат. Мисалы, айрым ырларда табият

[142] Каратаев, А. (1991). *Кыргыз поэзиясынын тарыхы.* Бишкек: Кыргызстан.
[143] Осмонов, Э. (2002). *Миф жана акындык аң-сезим.* Бишкек: Илим.

кубулуштары социалдык теңсиздик, элдин азап-тозогу менен салыштырылат. Бул — көркөм протесттин, идеялык сындаманын формасы.

Кыргыз акындары фольклорго кайрылуу менен өз поэзиясын улуттук өзгөчөлүктөргө сугарып, эл менен болгон байланыштарын чыңдашат. Бул өз ара байланыш поэзияны элдик таасирден алыс кылбайт, тескерисинче, аны турмуш менен бекем байланыштырат. Демек, мифологиялык образдар — бул поэзиядагы көркөм куралдар гана эмес, элдик аң-сезимдин эстетикалык чагылышы.

Мындан тышкары, айтыш өнөрүндө да мифтик түшүнүктөр орун алган. Акындар кээде айтышта өзүн касиеттүү аруахтардын урпагы катары сүрөттөшөт же болбосо каршылашын жиндер дүйнөсүнө салыштырып, анын терс жактарын сындайт. Бул — элдик поэтикалык логиканын жана символикалык ой жүгүртүүнүн жандуу мисалы.

Ошентип, кыргыз акындарынын чыгармаларында мифологиялык образдар поэтикалык чечмелөөнүн натыйжасында гана эмес, алардын дүйнө таанымындагы терең руханий багыт аркылуу ачылат. Бул образдар элдин ишенимдерин, эстетикалык табитин жана тарыхый эс тутумун камтып турат. Поэзияда алар — форма эмес, мазмун, идея эмес, мурас. Кыргыз акындары ошол мурастын тирүү мураскорлору катары поэтикалык изги миссияны аткарып келишет.

Кыргыз акындарынын чыгармачылыгында мифологиялык образдардын поэтикалык чечмелөөсү — бул улуттук дүйнө тааным менен көркөм ой жүгүртүүнүн жуурулушкан формасы. Бул образдар аркылуу акындар элдин архаикалык түшүнүктөрүн, руханий баалуулуктарын жана жаратылыш менен болгон байланышын терең чагылдырууга жетишишет. Поэзияда колдонулган мифтик элементтер символдор, метафоралар жана салыштыруулар аркылуу элдин руханий турмушунун эстетикалык коду катары ачылып берилет.

Токтогул, Барпы, Эшманбет, Эсенаман сыяктуу акындардын поэтикалык мурастарында мифология тарыхый эс тутумду сактоо гана эмес, азыркы коомдук-руханий реалдуулукту да чагылдыруу каражаты катары кызмат кылат. Алардын поэзиясы аркылуу кыргыз элинин дүйнө таанымы, табиятка болгон ыйык мамилеси жана рух дүйнөсүнө болгон ишеними көркөм жана терең маани менен ачылат.

Мифологиялык образдардын поэтикалык чечмелөөсү адабият таануу, фольклористика жана маданий мурастарды изилдөө багытындагы маанилүү тема катары өз актуалдуулугун сактап келет. Кыргыз поэзиясындагы бул көрүнүш — элдик мурастын жандуу уландысы, акындар аркылуу муундан муунга өткөн руханий дөөлөт. Ушундан улам, миф — бул жөн гана уламыш эмес, ал — поэзиянын жүрөгү, элдин аң-сезиминдеги символикалык акыйкат.

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ЭПОС ЖАНА АЙТЫШ ӨНӨРҮНДӨ БАЙЫРКЫ МИФТЕРДИН САКТАЛЫШЫ

Анотация: *Бул макалада кыргыз элинин эпосунда жана айтыш өнөрүндө байыркы мифологиялык түшүнүктөрдүн, образдардын жана дүйнө таанымдардын кандайча сакталып, чыгармачылыкта кайрадан иштелип, улуттук аң-сезимдин бөлүгү катары жашап келатканы иликтенет. Айрыкча "Манас" эпосундагы мифологиялык катмарлар, табигый кубулуштарга байланыштуу ишенимдер, ааламдын үч катмардуу түзүлүшү, каармандардын мифтик функциялары (баба рух, духтар, жети атанын колдоосу ж.б.) мисалында чечмеленет. Айтыш өнөрүндө болсо, акындар аркылуу оозеки мурастын улануусу, байыркы мифтерге кайрылуу, табият менен адамдын байланышына басым жасалган. Макалада мифтердин элдик чыгармачылыктагы жандуу формасы, дидактикалык жана тарбиялык функциялары баса белгиленип, заманбап фольклористикалык методдор аркылуу талдоо жүргүзүлгөн.*

Күлүч сөздөр: *эпос, айтыш, мифология, фольклор, Манас, мифтик образдар, улуттук аң-сезим.*

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THE PRESERVATION OF ANCIENT MYTHS IN EPIC AND AYTYSH TRADITIONS

Annotation: *This article explores how ancient mythological concepts and images are preserved in the Kyrgyz epic tradition and improvised oral poetry (aytysh). It examines the layers of mythology within the "Manas" epic, including beliefs related to natural phenomena, the three-layered structure of the universe,*

and the mythological roles of characters (e.g., ancestral spirits, protective entities, the power of lineage). In the art of aytysh, the transmission of oral heritage, references to ancient myths, and the deep connection between nature and human beings are emphasized. The article highlights the educational and moral functions of these myths and analyzes them through modern folkloristic approaches.

Keywords: *epic, aytysh, mythology, folklore, Manas, mythological images, national consciousness.*

Кыргыз элинин байыркы руханий маданияты – бул кылымдарды карыткан элдик акылмандыктын, дүйнө таанымдын жана эстетикалык идеалдардын жыйындысы. Бул мурастын эң терең жана түпкү катмарларын мифология түзөт. Миф – бул элдин табигый жана социалдык дүйнө жөнүндөгү элестетүүсүнүн алгачкы, символдор аркылуу берилген формасы катары каралат. Ал адамдардын жашоосу, дүйнөнүн түзүлүшү, жаратылыш кубулуштары жана рухий дүйнө жөнүндөгү архаикалык түшүнүктөрдү камтыйт.

Кыргыз элдик чыгармачылыгында, айрыкча эпостордо жана айтыш өнөрүндө мифологиялык сюжеттер, образдар жана символдор кеңири кездешет. Бул көрүнүш кыргыз элинин байыркы космологиялык караштарын, рухтар дүйнөсүнө болгон ишенимин жана адам менен табияттын байланышын ачып берет. Эпос — бул элдин тарыхы, дүйнө таанымы жана рухий нарк-насилин чагылдырган улуу мурас болсо, айтыш — ошол эле мурастын жандуу, динамикалык формасы болуп эсептелет.

Айрыкча “Манас” эпосунда мифтик элементтер өзгөчө орунду ээлейт. Эпостогу үч катмардуу аалам – асман, жер, жана жер асты дүйнөсү – байыркы түрктөрдүн жана кыргыздардын космологиясын чагылдырат. Каармандардын жаратылыш күчтөрү менен болгон байланышы, рухтардын колдоосу жана тагдырдын мифтик чечмелөөсү бул эпосту жонокой тарыхый баяндан жогору көтөрүп, аны мифологиялык-философиялык деңгээлге жеткирет.

Айтыш өнөрүндө болсо, мифология поэтикалык жана стилистикалык каражат катары колдонулат. Айтышта акындар элдин тарыхый эс тутумуна, ата-бабалардын каада-салттарына кайрылып, жаратылыш кубулуштарын, жаныбарлар дүйнөсүн жана рухий күчтөрдү символикалык мааниде чагылдырышат. Бул аркылуу алар өз заманынын көйгөйлөрүнө, элдик турмуштун ар кыл аспектилерине карата терең философиялык көз караштарын билдиришет.

Аталган макалада эпос жана айтыш өнөрүндө сакталган мифологиялык катмарлар талданып, алардын элдик аң-сезимди калыптандыруудагы орду

иликтенет. Ошондой эле мифтердин чыгармалардагы формалдуу эмес, поэтикалык-мазмундук сакталышы жана алардын тарбиялык-философиялык маанисиче чечмеленет.

Изилдөөнүн актуалдуулугу — бүгүнкү күндө элдик оозеки мурастын сакталышы жана алардын тарбиялык потенциалын кайрадан карап чыгуу зарылчылыгында. Себеби мифтерди эпос менен айтыш аркылуу изилдөө кыргыз элинин байыркы дүйнө таанымын түшүнүүгө жана улуттук аң-сезимди бекемдөөгө өбөлгө түзөт.

Кыргыз элинин рухий дөөлөтүнүн түпкү өзөгү мифология аркылуу берилген. Мифтер байыркы адамдардын дүйнө таанымынын жана жашоосунун күзгүсү болуп, алар жаратылыш кубулуштарын, рухтар дүйнөсүн, кудайлар менен адамдын байланышын түшүндүрүүнүн эң алгачкы формалары катары кызмат кылган. Бул мифологиялык дүйнө кыргыз элинин фольклорунда, айрыкча эпос жана айтыш өнөрүндө өзүнчө формада сакталып калган.

Эпикалык чыгармалар кыргыз элинин мифтик аң-сезиминин көркөм чагылуусу болуп саналат. Айрыкча "Манас" эпосунда жаратылыш менен адамдын жуурулушу, арбактарга ишенүү, үч катмардуу аалам түшүнүгү (асман – жер – жер астындагы дүйнө) кеңири сүрөттөлөт. Бул түшүнүк түрк элдеринин байыркы тенгричилиги менен тыгыз байланышта. Манастын төрөлүшү, балалыгы, арбактардын колдоосу жана анын тагдырындагы мистикалык элементтер – булардын баары мифологиялык катмар катары чечмеленет.[144]

Мисалы, Манас дүйнөгө келгенде жаратылышта өзгөрүү болот: тоо жаңырып, асман жарык тартып, кудуреттүү белги берилет. Бул көрүнүш мифологиядагы "бош ааламга кудайлык нурдун келиши" темасына үндөш. Мындан тышкары, Манастын арбактар менен байланышта болушу жана ата-бабалардын руху аркылуу колдоого ээ болушу да байыркы тотемдик ишенимдерге дал келет.

Каармандардын көпчүлүгүнүн образдарында мифологиянын изи байкалат. Маселен, Буура-Кербеш – бул ат эмес, эпикалык тотем. Буура (текечер) байыркы түрк элдеринде кут, ыйык рух менен байланышкан жаныбарлардын бири болгон. Анын кудурети жана акылдуулугу Манастын күчүн эки эселеп тургандай сүрөттөлөт.

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[144] Токтогулов, А. (2011). *Кыргыз элинин фольклору*. Бишкек: «Кыргызстан» басмасы.

Ошондой эле эпостогу ар кандай жоо душмандардын, ажыдаар, жин, шайтандын элестери – мифологиялык жамандыктын күчтөрүн чагылдыруучу образдар. Алар менен күрөшүү – бул жарык менен караңгылыктын күрөшү, жамандык менен жакшылыктын символикалык салгылашы.

Айтыш – элдик оозеки поэзиянын эң жандуу формасы. Айтышта акындар элдин руханий дүйнөсүн, тарыхын жана философиялык көз карашын камтыган поэтикалык туундуларды жаратышат. Бул өнөрдө мифология көбүнчө символикалык каражат катары колдонулат. Акындар табиятты адам менен жуурулушкандай сүрөттөшөт: шамал – жин, күн – нур, түн – караңгы күч, деп берилет.[145]

Айтышта байыркы эпостордогу каармандардын образдары да кездешет. Айрым учурда Теңирге кайрылуу, ата-бабанын арбагын чакыруу, түбү терең элеске – бул дүйнө менен тиги дүйнөнүн ортосундагы байланыш тууралуу ыр саптары айтылат. Бул болсо оозеки мурастын байыркы мифтерди жашатып жатканын далилдейт.

Кыргыз мифтеринин негизги функцияларынын бири – тарбиялык жана дидактикалык мазмунунда. Байыркы мифтер адамды жамандыктан сак болууга, жаратылышты ыйык деп билүүгө, ата-бабанын осуятын угууга үндөйт. Эпостордо, айтыштарда бул мазмун ырдык формалар аркылуу элге жеткирилет.

Заманбап изилдөөлөр мифологиялык мотивдердин дагы эле кыргыз поэзиясында жана фольклорунда активдүү колдонуларын көрсөтүп келет. Бул – элдин рухий дүйнөсүндө мифология дагы эле жашап, жаңы муундар үчүн тарбия жана улуттук өзүнчө таануу булагы экенин көрсөтөт.

Фольклор – бул мурас гана эмес, жандуу процесс. Эпикалык мифология бүгүнкү күндө театралдаштырылган манас айтууда, айтыш сынактарында, жогорку окуу жайлардын окуу программаларында сакталууда. Бул баалуулуктарды илимий-методикалык негизде изилдөө – элдик дөөлөттөрдү сактап калуунун маанилүү жолу.

Ошондой эле айтыш өнөрүнүн ЮНЕСКО тарабынан адамзаттын мурасы катары таанылышы – бул мифология менен фольклордун глобалдык мааниге ээ экенин көрсөтөт. Бул өнөрдү изилдөө жана сактоо аркылуу биз өз тарыхыбызды гана эмес, дүйнөлүк маданияттын бир бөлүгүн да коргойбуз.

Кыргыз элинин эпикалык чыгармалары менен айтыш өнөрү – бул жөн гана поэтикалык же фольклордук көрүнүш эмес, булар байыркы элдин дүйнө таанымын, жашоо философиясын жана рухий маданиятын сакталып калган эң терең формадагы мурастар. Бул мурастарда мифология өзүнүн ар түрдүү

[145] Осмонов, Т. (2018). *Айтыш – эл рухунун оозеки тили*. Бишкек: «Турар» басмасы.

формаларында – образдар, сюжеттер, ишенимдер, символдор аркылуу бүгүнкү күнгө чейин жашап келет.

Айрыкча “Манас” эпосундагы каармандардын арбактар менен байланышы, рухтар дүйнөсүнө болгон ишеним, жаратылыш күчтөрүнүн персоналдаштырылышы – мунун бардыгы байыркы мифтердин көркөм формада сакталышынын далили. Ошондой эле айтыш өнөрүндө акындардын символикага кайрылуусу, элдин тарыхый эс тутумуна таянуусу жана табият менен руханий дүйнөнүн байланышын ыр аркылуу берүүсү – бул өнөрдүн да мифология менен тыгыз байланышта экенин көрсөтөт.

Бүгүнкү күнү эпос жана айтыш аркылуу мифтерди изилдөө, алардагы тарбиялык, философиялык жана дидактикалык катмарларды ачып берүү – улуттук аң-сезимди бекемдөөгө, элдин тарыхын жана маданиятын жаңыча деңгээлде түшүнүүгө өбөлгө түзөт. Элдик мурастарды заманбап билим берүү процессине интеграциялоо аркылуу биз жаңы муунду өз тамыры менен тааныштырган болобуз.

Жыйынтыктап айтканда, эпос жана айтыш өнөрү кыргыз элинин мифологиялык эстутумун, акыл-эсин жана нарк-насилин кийинки муундарга өткөрүп берүүчү көпүрө катары маанилүү. Бул мурастарды изилдөө жана сактоо — улуттук өзүнчө таанууну сактап калуунун жана дүйнөлүк маданиятта татыктуу орун ээлөөнүн негизги шарттарынын бири болуп саналат[146].

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УН ШУДРИНГ КАСАЛЛИКЛАРГА ҚАРШИ КУРАШ САМАРАДОРЛИГИ

Аннотоция. *Ушбу маколада уншудринг касаллиги ва унга карши кураш батафсил ёритилган. Ун шудринг касаллиги замбуругли касаллик бўлиб ёш новдаларнинг учини ва баргини зарарлайди. Бунда новданинг уч томони, барги оқ унсимон ғубор билан қопланиб қолади. Натижада новдалар ўсишдан орқада қолади ёки бутунлай ўсмайди. Касалликка қарши курашда куртаклар ёзилгунга қадар дарахтлар сувда намланувчи олтингугурт (100 литр сувга 0,8-1 кг ҳисобидан) ишланади.*

Калит сўзлар: *мева дарахтлари, мармелад, мураббо, шакар, органик кислоталар, Симиренко , ун шудринг, замбуруғ, касаллик, олтингугурт, Топсин-700.*

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EFFICIENCY OF COMBATING UN ROSE DISEASES

Abstract: *This article details powdery mildew and the fight against it. Powdery mildew is a fungal disease that affects the tips and leaves of young shoots. In this case, the three sides of the shoot and the leaf are covered with a white powdery mildew. As a result, the shoots lag behind or do not grow at all. To combat the disease, trees are treated with water-soaked sulfur (0.8-1 kg per 100 liters of water) before bud break.*

Keywords: *fruit trees, marmalade, jam, sugar, organic acids, simirenco, powdery mildew, fungus, disease, sulfur, topsin-700.*

Кириш.Ўзбекистоннинг табиий шароити мева дарахтлари ва ток ўстириш учун энг қулай ҳисобланади. Ўзбекистонда кўплаб мевали дарахтлар: олма, нок, бехи, олча, гилос, шафтоли экилади. Бироқ, боғ ва токзорларда уларнинг ҳосилини зараркунанда ва касалликлардан ҳимоя қилмай туриб, юқори сифатли ҳосил олиб бўлмайди. Ўзбекистоннинг мева боғларида 260 дан зиёд зараркунанда ва 50 дан зиёд касалликлар учраши қайд қилинган. Фақат олма қуртининг ўзигагина қарши кураш олиб борилмаса, ҳосилнинг 50 ва ҳатто 70% ини йўқотиш мумкин.

Зараркунанда ва касалликларга қарши кураш самарадорлигини ошириш учун аввало боғларнинг парваришига алоҳида эътибор бериш керак. Боғ ва токзорларни барпо этишда уларнинг атрофига ихота дарахтларидан (жийда, тол, терак ва бошқалар) экиш лозим. Улар изғирин ва совуқ шамоллардан ҳимоя қилади. Ер ости суви яқин жойлашган тупроқларда боғ ва токзорлар барпо этишдан олдин коллектор-зовурлар қазиб, зах сувлар сатхи пасайтирилиши зарур.

Мавсум давомида парваришлаш тадбирларига дарахтларни вақтида суғориш, озуқа бериш, сифатли шакл бериш ва буташ, токларни хомток қилиш, мевали дарахтлар, айниқса, данаклиларнинг танасини оқлаш киради.

Ўзбекистонда етиштириладиган олмалар таркибида ўрта хисобда 80,5-86,5% сув ; 9,6-14,8 % шакар; 0,31-0,91 % органик кислоталар; 0,27-0,48 % эрувчан пектин; 0,025-0,060 % га яқин ошловчи моддалар; 0,10-0,45 % минерал тузлар ва бир қанча витаминлар бор. Олманинг қишки навлари қимматлидир.

Олма катта дарахт бўлиб, бақувват танасининг баландлиги 12-20 м га етади. Унинг шох-шаббаси ҳам кенг ёйилиб ўсади. Ҳосилга турли, вақтда киради. Пишиш вақтига қараб ёзги, кузги ва қишки навларга бўлинади. Мевасининг шакли, йирик майдалиги, ранги ва хушбўйлигига қараб ҳам бир-биридан фарқ қилади. Олма дарахтларининг яшаш даври уларнинг навига, пайвандтагка ҳамда қўлланиладиган агротехника усулларига боғлиқ. Кучли пайвандтагларга уланган олма дарахтлари ўрта ҳисобда 45-50 йил, айрим туплари эса 100 йил ва хатто ундан ҳам узоқ яшайди.

Ўзбекистонда асосан европадан келтирилган олмани навлари: Ренет Симиренко, Оқ Розмарин, қишки сариқ Пармен ва шимолий-америка навларидан: сариқ бельфлер, Вайнсеп, Джанатан, Джоноред, Годен Делишес, Кинг Девид; маҳаллий навлардан: Первенец Самарканда, Тошкент Боровинкаси ва Нафис навлари етиштирилади.

Тадқиқот услубияти. Ун шудринг касаллиги замбуруғли касаллик бўлиб ёш новдаларнинг учини ва баргини зарарлайди. Бунда новданинг уч томони, барги оқ унсимон ғубор билан қопланиб қолади. Натижада новдалар ўсишдан орқада қолади ёки бутунлай ўсмайди. Ун шудринг касаллиги ёш олма дарахтларига катта зарар келтиради. Касаллик юқумли бўлиб, кўпинча куртакда қишлайди. Баҳор серёғин келган йиллари ун шудринг айниқса авж олади.

Ёш олма дарахтларидаги, касалланган новдалар кўкламда кесиб олиб ташланади. Куртаклар ёзилгунга қадар дарахтлар 3 йилда 1 маротаба нитрофен (100 литр сувга 2 кг ҳисобидан) билан, мавсум давомида эса сувда намланувчи олтингугурт (100 литр сувга 0,8-1 кг ҳисобидан) ишланади.

Биринчи пуркаш касалликнинг дастлабки белгилари аниқланиши биланоқ ўтказилади. Кейинчалик эса яна 1-2 маротаба 10-12 кун оралатиб сепилади. Агар пуркаш муддатлари зараркунандаларга қарши кураш муддати билан тўғри келиб қолса, унда икки тадбир омухта қилиб, бир йўла ўтказилади. Туйилган олтингугуртни чанглатса ҳам бўлади.

Тақиқот натижалари ва уларнинг тахлили. Тажриба Андижон вилояти, Пахтаобод тумани, “Халилилло” фермер хўжалиги шароитида олиб борилди, 4 қайтариқ 4 вариантдан иборат бўлиб, 1ярусда жойлаштирилди. Кўчатлар 4х5-1 схемасида экилган. Асосий нав қилиб “Семеренка” нав олинди. Тажриба қўйилгунга қадар ушбу нав 20.5 фоиз ун шудринг касаллиги билан касалланган.

Тажриба “Шредер” номидаги боғдорчилик ва узумчилик илмий тадқиқот институтти томомнидан чоп эилган услубият асосида олиб борилди.

Кузатувларга кўра тажрибадаги вариантлардаги дарахтлар ўсув ва мева шохларини баландлиги берилган. Хисобга кўра ўсув шохлар 15.III даги назорат вариантида 0.4 см Топсин-700 гр/га ишлатилган вариант 0,7 см, кейинги саналарда 3 вариант назоратига қараганда 0.8 см баландлиги аниқланган. Қолган вариант 0.4- 0.5 см.

Мева шохлари ҳисобга олинганда ҳам шундай тафовудни кузатишимиз мумкин. 1 апрелда назоратга нисбатан 3 вариантда 0,2 см, 1 майда эса 0,6 см билан фарқланади.

Касаллик ва зараркунандалар билан зарарланган бўлса мева сифати бузилади. Ўртача карши кураш чораларида касалликларни олдини оламиз.

Топсин -М кимёвий модданинг олманинг ун шудринг касаллигига таъсири.

Жадвал 1

т/р	Тажриба вариантлари	Хисобга олинди				
		1.V	1.VI	1.VII	1.VIII	1.IX
1	Назорат	0.7	1.5	3.4	5.9	8.4
2	Топсин –М -700 гр/га	0.4	1.0	2.3	3.4	4.6
3	Топсин –М -800 гр/га	0.1	0.3	1.0	2.5	3.2
4	Топсин –М -900 гр/га	0.3	0.8	1.6	3.5	4.2

Хулоса ва таклифлар. Топсин-М кимёвий моддани касаллик таъсири ҳисобларини тахлил қиламиз. Назоратда 1 майда 0,7% ни ташкил этса, 3-вариантда 0,1%, Топсин –М -800 гр/га меъёрда сарфланган вариантда назоратга нисбатан 5,2 % кам зарарланган.

Май ойи ҳисобида назоратга нисбатан айнан шу вариантда 35% кўпроқ мева шаклланган. Августда 3- вариантда эса 35 % назоратга нисбатан кўпроқ. Олинган кузатув натижаларига кўра назорат вариантига нисбатан 3 вариантда 13.9 т қўшимча ҳосилдорликга эришилди.

Топсин-М кимёвий моддасининг 800 гр/га қўлланилганда касаллик қўзғатувчи учун кучли фунгицид вазифасини ўтай олган. Бунда хўжалик иклим шароитга кўра мева касалликларига қарши курашда муддатнинг аҳамияти катта. Топсин-М кимёвий моддасининг 800 гр/га хисобида

олиниши касалликни 3.0 фоизга камайтирибгина қолмай, хосилдорликни назоратга нисбатан 56,0 т/га ортган.

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ГИСТОЛОГИЧЕСКИЙ МЕТОД ОПРЕДЕЛЕНИЯ ПРИЖИЗНЕННОСТИ ПОВРЕЖДЕНИЙ В ГНИЛОСТНО ИЗМЕНЕННЫХ ТКАНЯХ

Аннотация. *Вопросы экспертной практики, связанные с определением прижизненности и давности повреждений, остаются открытыми, так как на сегодняшний день нет четких критериев, позволяющих с высокой долей вероятности определить прижизненность и давность повреждений, особенно если они причинены в ранние сроки пре- и постмортального периода. В статье освещаются подходы различных авторов оценки морфологических признаков и значимости ряда гистологических окрасок в ходе проведения Методом Лепене является гистологическим способом выявления внутриклеточного и внеклеточного гемоглобина в тканях для обнаружения кровоизлияний.*

Ключевые слова: *прижизненность и давность повреждений, гистологические окраски, гнилостные изменения*

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HISTOLOGICAL METHOD FOR DETERMINING THE LIVELESSNESS OF DAMAGE IN RECOVERY-CHANGED TISSUES

Abstract. *The questions of expert practice related to determining the lifetime and duration of injuries remain open, as to date, there are no clear criteria that allow for a high probability of determining the lifetime and duration of injuries, especially if they were caused in the early stages of the pre- and post-mortem period. The article covers the approaches of various authors to assessing morphological features and the significance of a number of histological stains during the Lepene method is a histological method for detecting intracellular and extracellular hemoglobin in tissues to detect hemorrhages.*

Keywords: *lifetime and duration of damage, histological colors, putrefactive*

Актуальность. Диагностика и правильная оценка посмертных процессов занимают важное место при постановка судебно-медицинского диагноза [1]. Гистологические методы исследования позволяют провести дифференциальную диагностику прижизненных повреждений и кровоизлияний, также установить наличие патологий в гнилостно

измененных тканях и органах [2,3,4]. Гистологические исследования приобретают огромное практическое значение для выявления и оценки прижизненных реакций в органах и тканях, возникающих в ответ на действие внешних и внутренних факторов [5,6].

Метод Лепене был предложен в 1919 г немецким врачём G. Lepehne и является гистологическим способом выявления внутриклеточного и внеклеточного гемоглобина в тканях для обнаружения кровоизлияний. Метод основан на выявлении пероксидазных свойств гемоглобина, которые зависят от каталитических свойств содержащегося в нем железа путем помещения замороженных срезов в смесь раствора бензидина и перекиси водорода.

Цель исследования. Изучение современных гистологических методов определения прижизненности в гнилостно измененных тканях.

Материалы и методы исследования. Исследуемые гистологические кусочки фиксировались в формалине. Замороженные срезы переносили из воды и помещали на 5 минут в свежеприготовленный раствор бензидина с перекисью водорода (2 мл 0,6% р-ра бензидина в 96% спирте, 0,5 мл перекиси водорода, 4,5 мл 70% спирта). Затем срезы промывали сначала в 50% спирте, а потом быстро в дистиллированной воде. Срезы обезвоживали и заключали в канадский бальзам.

Результаты исследования. При микроскопическом исследовании отмечено, что гемоглобиновый пигмент в поврежденных участках окрашивался в жёлто-коричневый и буро-коричневый цвет на бледно-серо-голубом и бледно-бежевом фоне.

В отдельных участках обнаружены крупные и распространённые очаги отложения гемоглобинового пигмента, которые в наиболее вероятной форме свидетельствует о прижизненном образовании повреждений.

Для дифференцированного выявления гемоглобина и гемосидерина срезы до окраски клеточных ядер помещали в смесь 2% р-ра железистосинеродистого калия и 1% раствора соляной кислоты, взятых в равных количествах; при этом гемоглобин оставался темно-коричневым, а гемосидерин окрашивался в синий цвет.

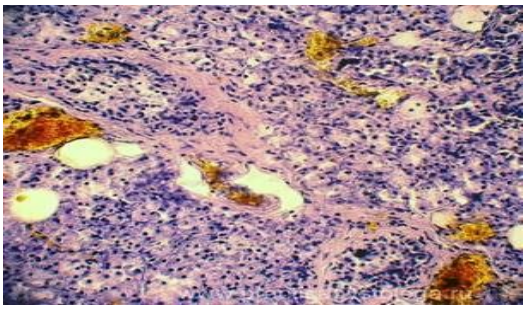

Рис. 1. Срез-контроль: интактная слюнная железа окрашена в серо-синий цвет. Эритроциты в просветах сосудов буро-коричневого цвета. Окраска: по Лепене. Увеличение х250.

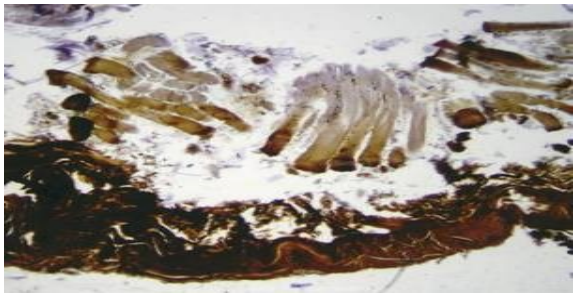

Рис. 2. Средней величины очаг отложения гемоглобинового пигмента в виде буро-коричневого окрашивания на серо-голубом фоне. Очаговое геморрагическое пропитывание групп скелетных мышечных волокон. Окраска: по Лепене. Увеличение х250.

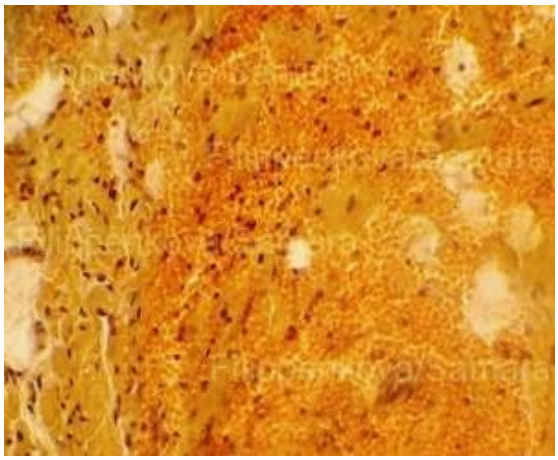

Рис. 3. Фрагмент крупноочагового деструктивного кровоизлияния буро-красного цвета, различимо умеренное количество лейкоцитов. Окраска: по Лепене. Увеличение х250.

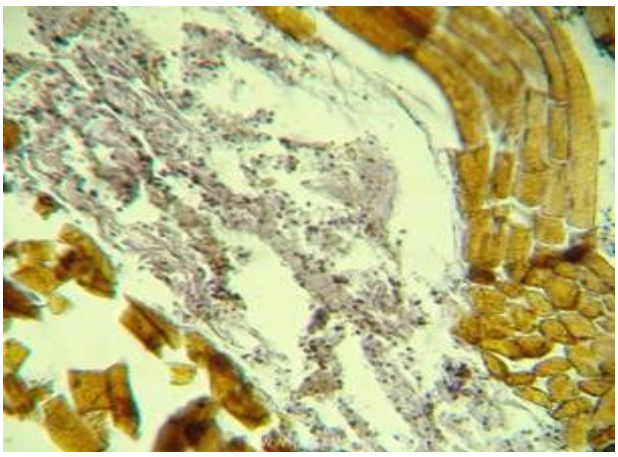

Рис.4. Субтотальное геморрагическое пропитывание скелетных мышечных волокон (окрашены в буро-коричневый цвет на серо-голубом фоне). В соединительной ткани различим очаговый умеренно выраженный лейкоцитоз. Окраска: по Лепене. Увеличение

При наличии мелких очагов отложения гемоглобинового пигмента, а также при выявлении геморрагического пропитывания тканей высказаться о прижизненном происхождении повреждений не представлялся возможным.

При резко выраженных гнилостных изменениях тканей, обильной гнилостной бактериальной и грибковой микрофлоре может быть ложноотрицательная реакция по Лепене (отрицательная окраска при имевшем место кровоизлиянии).

Выводы. Выявленные гистологические изменения по методу Лепене помогают диагностировать прижизненные повреждения и кровоизлияния в отдаленные сроки после травмы, даже в гнилостно изменённых тканях.

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ОСОБЕННОСТИ ПОВРЕЖДЕНИЙ, ПРИЧИНЁННЫХ НОЖОМ С ВОЛНИСТОЙ ПЛОСКОСТЬЮ КЛИНКА

Аннотация. *Особенности повреждений, причиненных ножом в судебно-медицинской экспертизе (СМЭ), зависят от формы и остроты лезвия, глубины проникновения, направления удара и подвижности человека в момент нанесения ранения. Типичные признаки включают веретенообразную или щелевидную форму раны, ровные края, а также возможные повреждения на костях или хрящах, которые могут быть полезны для определения орудия. Это подчеркивает актуальность темы статьи проведения в этом направлении научного исследования, результаты которого будут иметь важное значение для теории и судебно-медицинской экспертной практики.*
Ключевые слова: *колото-резаное повреждение, волнистый ножа*

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FEATURES OF INJURIES CAUSED BY A KNIFE WITH A WAVELY PLANE OF THE BLADE

Abstract. *The specifics of injuries inflicted by a knife in forensic medical examination (FME) depend on the shape and sharpness of the blade, the depth of penetration, the direction of the blow, and the person's mobility at the time of injury. Typical signs include spindle-shaped or slit-shaped wounds, smooth edges, and possible bone or cartilage injuries that can be helpful in determining the weapon. This emphasizes the relevance of the topic of the article for conducting scientific research in this area, the results of which will be important for the theory and forensic medical practice.*
Keywords: *stab wound, corrugated knife*

Актуальность.Производство судебно-медицинских экспертиз, связанных с идентификацией орудия травмы по колото-резаным повреждениям, основывается на выявлении признаков, позволяющих определить групповые свойства травмирующего предмета, а затем и индивидуальные. Особенности орудий травмы отображаются на следовоспринимающем объекте, и зависят от их конструктивных особенностей [1,2,3,4]. Поэтому следует неукоснительно соблюдать порядок

описания повреждений на следовоспринимающем объекте [5,6,7], а при экспертизе следообразующего объекта фиксировать конструктивные элементы, имеющие идентификационное значение.

Цель работы. Экспериментально установить на следовоспринимающих объектах особенности образования идентификационных признаков от колюще-режущего действия кухонного ножа с волнистой плоскостью клинка.

Материалы и методы исследования. В качестве следообразующего предмета выбран овощной однопредметный нож (*фото 1*), состоящий из рукояти и клинка, насадного способа крепления.

Фото 1.

Клинок металлический, длиной 8,80см, однолезвийный, окрашен в чёрный цвет, на плоской части основания клинка слева имеется надпись «EVCRIERH», в области заточки ножа цвет клинка серебристо-серый, блестящий; линии обушкового и лезвийного краёв симметричные, дугообразно выпуклой формы, переходящие в скос, высота дуг 0,40см. Обушок П-образной конфигурации, прямолинейной формы у основания на протяжении 1,20см и толщиной 0,09см, на остальном протяжении в виде поперечных волн с расстоянием между заглублёнными участками 0,60см и расстоянием между вершинами волн на противоположных поверхностях 0,12см (*фото 2*).

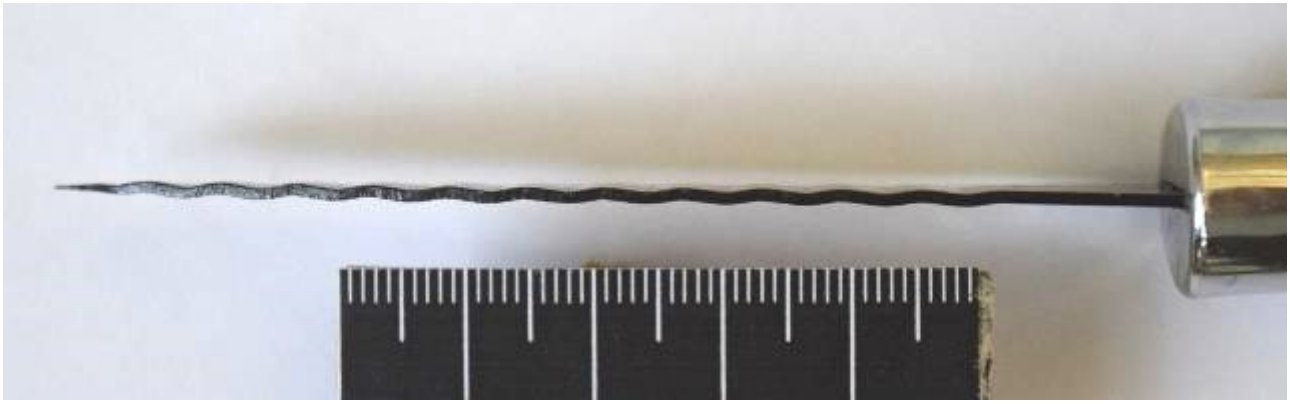

Фото 2.

Лезвие двухсторонней заточки, симметричное, поля заточки начинаются на расстоянии 0,29см от торцевой поверхности рукояти, в виде вогнутых плоскостей шириной 0,40-0,75см, верхний край полей заточки волнистой формы, вдоль лезвийного края фаска шириной 0,04см; у основания режущего края незаточенный участок протяжённостью 0,82см, на ощупь лезвие острое (при незначительном надавливании и протягивании режет ребро писчей бумаги). Остриё образовано обушком и лезвием, закруглённой формы, на ощупь острое, угол острия имеет протяжённость 0,40см, угол между линиями обушка и лезвия на расстоянии 1,00см от острия составляет 28º; 2,00см – 21º; 3,00см – 13º; 4,00см – 10º; 5,00см – 7º. Ширина клинка на расстоянии от острия в сантиметрах:

1,00	2,00	3,00	4,00	5,00	6,00	7,00	8,00	8,80
0,78	**1,21**	**1,49**	**1,70**	**1,81**	**1,92**	**2,00**	**2,10**	**2,11**

Следовоспринимающими объектами служит сложенная пополам плотная бумага, внутрь которой помещён отрезок бинта, имеющий разреженное тканное плетение хлопчатобумажных нитей.

Экспериментальные повреждения причинены при погружении клинка кухонного ножа на две трети его протяжённости, обушковым краем относительно экспериментатора обращённого вверх, лезвийным – вниз, при четырёх условиях, обозначенных римскими цифрами: I – фронтальный и встречные углы 90º (отвесное погружение клинка ножа); II – фронтальный угол 90º и встречный угол 60º, открытый вверх (погружение с упором на обушок); III – фронтальный угол 90º и встречный угол 60º, открытый вниз (погружение с упором на лезвие); IV – фронтальный угол 60º, открытый вправо, и встречный угол 90º (погружение с упором на правую поверхность клинка).

Экспериментальные повреждения, полученные на бумаге и на ткани были исследованы с применением визуального, измерительного, стереомикроскопического, обзорного и макрофотографического методов исследования, и графического моделирования.

Результаты исследования.

I группа разрезов.

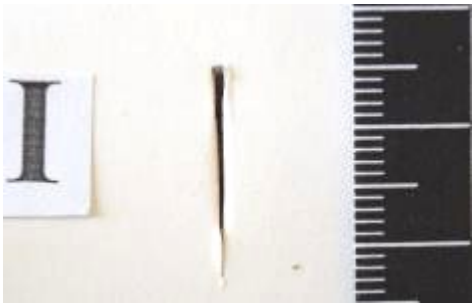

Фото 3.

На бумаге разрез удлинённо-клиновидной формы размерами 1,86х0,12см, прямолинейный, края ровные. Верхний конец расширенный, двугорбой формы, справа (по отношению к исследующему) края разреза валикообразно приподняты. Нижний конец остроугольной формы, на протяжении 0,35см от нижнего конца края разреза сомкнуты (*фото 3*).

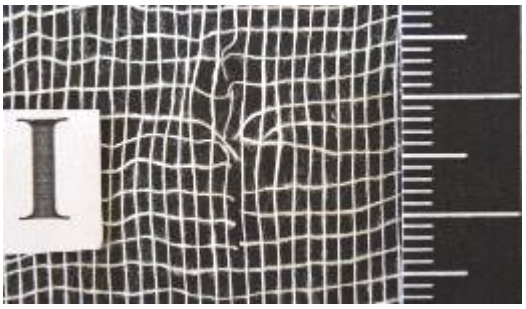

Фото 4.

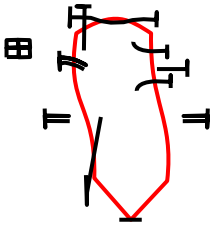

Рис. 5.

На ткани разрез размерами 2,08х0,59см извилисто-линейной формы, поперечные краевые нити пересечены на одном уровне, в верхней трети концы повреждённых поперечных краевых нитей выступают в просвет повреждения и отклонены вверх и вниз, на левом крае имеется уплотнение плетения нитей за счёт смещения продольных краевых нитей влево, а так же выступает повреждённая продольная краевая нить. Верхний конец имеет искривление поперечной концевой нити и выступает повреждённая продольная концевая нить. Нижний конец ограничен пересечённую в косом направлении поперечную концевую нить (*фото 4, рис.5*).

II группа разрезов.

Фото 6.

На бумаге разрез удлинённо-клиновидной формы размерами 1,93х0,11см, извилисто-линейный, преломляющийся на расстоянии 1,45см от верхнего конца, края ровные, слева выгнуты кнаружи, справа – вогнуты внутрь. Верхний конец расширенный, округло-М-образной формы, справа (по отношению к исследующему) края разреза валикообразно приподняты. Нижний конец остроугольной формы, на протяжении 0,30см от нижнего конца края разреза сомкнуты (*фото 6*).

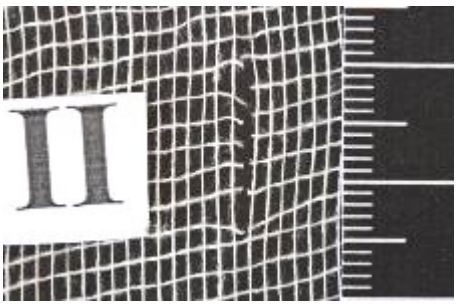

Фото 7.

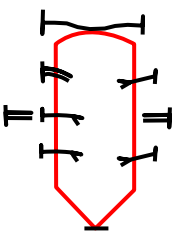

Рис.8.

На ткани разрез размерами 1,73х0,10см линейной формы, поперечные краевые нити пересечены на одном уровне с несколько

разлохмаченными волокнами, справа выступает целая продольная краевая нить, на левом крае в верхней части концы повреждённых поперечных краевых нитей отклонены вниз. У верхнего конца поперечная концевая нить дугообразно искривлена вниз. Нижний конец ограничен пересечённой поперечной концевой нитью (*фото 7, рис.8*).

III группа разрезов.

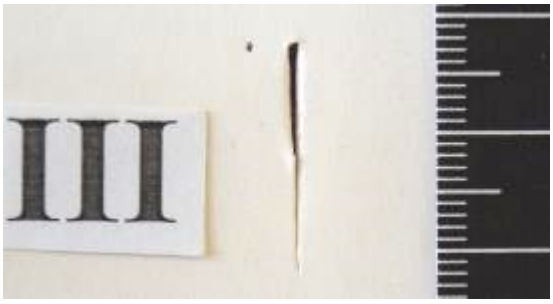

Фото 9.

На бумаге разрез размерами 1,94х0,10см, линейной формы с преломлением на расстоянии 1,45см от верхнего конца, верхний отрезок клиновидной формы с ровными вогнутыми края, нижний отрезок щелевидной формы с сомкнутыми ровными краями. Верхний конец скошенной П-образной формы. Нижний конец остроугольной формы (*фото 9*).

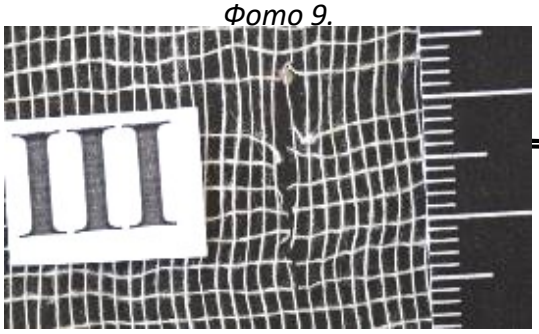

Фото 10.

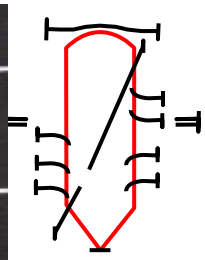

Рис.11

На ткани разрез размерами 1,71х0,12см линейной формы, поперечные краевые нити пересечены на одном уровне, слева отклонены вниз, а в верхней части правого края вверх и вниз, с несколько разлохмаченными волокнами, справа выступает продольная краевая нить, повреждённая у нижнего конца. У верхнего конца поперечная концевая нить дугообразно искривлена вверх. Нижний конец ограничен пересечённой поперечной концевой нитью (*фото 10, рис.11*).

IV группа разрезов.

Фото 12.

На бумаге разрез размерами 1,91х0,44см, дугообразной формы, состоящий из прямой линии в средней части длиной 1,80см и загибов верхнего конца на цифру 2 условного циферблата часов длиной 0,50см, а нижнего – на цифру 5 длиной 0,25см. Края линейной части относительно ровные, плоскость правого края вогнута внутрь. Верхний конец имеет полуовальную выемку на цифру 12 и загиб на цифру 2 с неровными зубчатыми краями, заканчивающийся остроугольно. Нижний конец с сомкнутыми волнисто-линейными краями оканчивается остроугольно (*фото 12*).

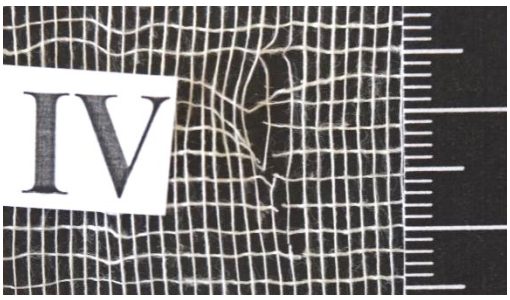

Фото 13.

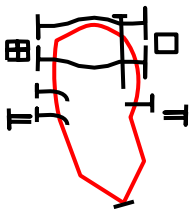

Рис.14

На ткани разрез размерами 1,66х0,68см в форме искривлённого восклицательного знака формы, поперечные краевые нити пересечены на одном уровне, и концами загнуты вниз, отмечается отклонение целых продольных краевых нитей влево. Верхний конец зияющий, в просвет его выступает дугообразно искривлённая вниз целая поперечная концевая нить, а справа плетение нитей разрежено за счёт выступания повреждённой продольной концевой нити. Нижний конец ограничен пересечённой поперечной концевой нитью (*фото 13, рис.14*).

Выводы. Конструктивные особенности волнообразного искривления плоскости клинка и обушка кухонного ножа сопровождаются дополнительным контузионным действием поперечно расположенных периодически повторяющихся волн и образованием идентификационных признаков на краях повреждений от механизма трения, на обушковом конце – обушковых разрывов. Расположение идентификационных признаков позволяет определить направление погружения травмирующего колюще-режущего орудия.

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ВЛИЯНИЕ ЛИЧНОСТНЫХ КАЧЕСТВ РОДИТЕЛЕЙ НА КОМПЬЮТЕРНУЮ ЗАВИСИМОСТЬ ДЕТЕЙ ДОШКОЛЬНОГО ВОЗРАСТА

Аннотация: *В статье исследуется влияние личностных качеств родителей на компьютерную зависимость детей дошкольного возраста. Целью является выявление связи между уровнем образования, технологической грамотностью, стилем воспитания и психологическим состоянием родителей, и степенью зависимости детей от электронных устройств. Методологической основой исследования стали анкетирование, интервью и наблюдение. Результаты могут быть полезны для профилактики технологической зависимости в семье и разработки рекомендаций для цифрового воспитания.*

Ключевые слова: *дошкольное образование, компьютерная зависимость, родители, стиль воспитания, технологическая грамотность, личностные качества, психология семьи.*

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THE IMPACT OF PARENTAL PERSONAL CHARACTERISTICS ON COMPUTER ADDICTION IN PRESCHOOL CHILDREN

Abstract: The *article examines the impact of parents' personal qualities on computer addiction in preschool children. The goal is to identify the relationship between parents' education level, digital literacy, parenting style, psychological characteristics, and the degree of children's dependence on electronic devices. The study is based on surveys, interviews, and observation. The findings may help prevent technology addiction in families and support recommendations for digital parenting.*

Keywords: preschool *education, computer addiction, parents, parenting style, digital literacy, personal qualities, family psychology.*

Актуальность исследования : Дошкольное образование является незаменимым источником начального образования в современной жизни.

Дошкольное образование относится к образованию детей от рождения до поступления в школу и включает в себя дошкольное социальное образование и дошкольное семейное образование.

Для общества образование является краеугольным камнем национального возрождения и социального прогресса, а также одним из основных способов повышения национального качества и всестороннего развития человека.

Нации без образования перестает существовать. Когда образование процветает, страна процветает; когда образование сильное, страна сильная.

В новую эпоху с развитием информатики, в нашу жизнь входит все больше и больше электронных продуктов. Это делает людей удобными для работы, жизни и учебы, но в то же время это палка о двух концах. Не только многие взрослые страдают зависимостью от электронных продуктов, но и дети дошкольного возраста также зависимы от электронных продуктов из-за личных качеств своих родителей.

Дошкольники, находящиеся на волне информатизации, постепенно привыкает к играм. Все больше и больше детей подвергаются воздействию виртуального мира, и у них все меньше и меньше возможностей для активного отдыха и социальных взаимодействий. Более того, поскольку родители заняты работой, «электронные няни» стали обычным явлением «присматривать» за своими детьми. В развитых странах более 70% детей дошкольного возраста используют дома телевизоры, компьютеры и т. д., а электронные товары стали новыми игрушками, любимыми детьми.

Однако дошкольный период (3-6 лет) является важным этапом роста и развития детей. Это должно заставить нас серьезно задуматься о влиянии, которое электронные продукты могут оказать на детей дошкольного возраста, задуматься о том, как рационально использовать электронные продукты. правильно относиться к развитию информационного века, думая о том, как использовать электронные продукты, чтобы сыграть эффективную роль в информатизации образования.

Объект исследования- Дети дошкольного возраста

Предмет исследования- Родители как поддержка детей со своими личностными качествами для предотвращения их компьютерной зависимости

Цель исследований: Влияние родителей со своими личными качествами на привычки и зависимость дошкольников от зависимости компьютера.

Задачи исследования:

-изучить как различные типы стилей воспитания (например, авторитарный, снисходительный и т. д.) влияют на компьютерную зависимость детей;

-раскрыть методы, способы семейная атмосфера и качество взаимодействия родителей и детей, влияют на поведение детей при использовании компьютера.

Методологическая основа исследования:

1.Метод документаций- для решения поставленных задач использовался комплекс теоретических методов исследования: изучение,анализ педагогической, систематизация и обобщение положений научно-методической литературы по проблеме исследования;

2.Анкетный метод

3.Метод интервью

4.Метод наблюдения

Теоретическая значимость исследования

1.Дошкольники переживают период быстрого когнитивного, эмоционального и социального развития, и их зависимость от электроники может иметь далеко идущие последствия для будущего. Это исследование заполнит пробел в исследованиях использования компьютера детьми дошкольного возраста и зависимости от него.

2.Анализируя влияние личных качеств родителей (таких как уровень образования, технологическая грамотность, стиль воспитания) на компьютерную зависимость детей, мы можем обогатить существующую теорию семейного образования о том, как образование родителей влияет на рост детей в среде информационных технологий.

3.Это исследование может предоставить конкретные данные и доказательства для изучения психологии развития детей и способствовать дальнейшему углублению исследований развития детей раннего возраста в контексте цифровой эпохи.

Практическая значимость исследования

-Помогает родителям лучше направлять детей в использовании технологий.

-Обеспечивает основу для формулирования политики в области образования.

- Повышает технологической грамотности в семейном образовании.

- Предупреждает устранение раннюю зависимость детей от технологий

- Содействует созданию здоровой среды цифрового образования и роста.

Во вводной части обосновывается актуальность темы исследования, анализируется степень разработанности проблемы, дается развернутая информация об объекте, предмете, целях и задачах исследования, указываются теоретические и методологические основы, методы, использованные в исследовании, научная новизна, излагаемые положения о возможностях и путях создания инклюзивной образовательной среды в дошкольных образовательных учреждениях, структура работы, ее теоретическая и практическая значимость.

Первая глава диссертации называется **“ОПРЕДЕЛЕНИЕ И СОВРЕМЕННАЯ СИТУАЦИЯ КОМПЬЮТЕРНОЙ ЗАВИСИМОСТИ СРЕДИ ДЕТЕЙ ДОШКОЛЬНОГО ВОЗРАСТА”.** Эта глава состоит из двух основных параграфов. Первый параграф называется “ Определение компьютерной зависимости у детей дошкольного возраста” и здесь

указывается, что зависимость от электронных гаджетов стала глобальной проблемой, проблема со здоровьем, которая требует достаточного внимания и вмешательства. Пристрастие к электронным продуктам не только влияет на физическое и психическое здоровье человека, но также может привести к ухудшению социальных функций. Чрезмерное использование электронных устройств может снизить социальные навыки дошкольников:

1. Ограниченные возможности взаимодействия в реальной жизни
2. Ухудшение способности к выражению речи
3. Отставание в развитии эмпатии может мешать детям понимать эмоции и социальные правила, заставляя их проявлять безразличие или отсутствие сочувствия в реальных социальных взаимодействиях.

Второй параграф называется “ Современное состояние компьютерной зависимости среди детей дошкольного возраста” и говорит о том что, последние годы, в связи с быстрым развитием глобальных технологий, популярность электронных устройств и интернета изменила образ жизни людей, а также оказала глубокое влияние на среду роста детей. Электронные устройства, такие как смартфоны, планшеты и компьютеры, стали важной частью современных домов. Хотя эти технологические изменения обеспечили удобство обучения и развлечений детей, они также породили новые проблемы, особенно чрезмерную зависимость детей дошкольного возраста от электронных устройств, которая постепенно стала острой проблемой, вызывающей глобальную озабоченность. Поэтому семьи должны уделять больше внимания управлению временем перед экраном и соответствующим образовательным рекомендациям, чтобы дети дошкольного возраста могли расти здоровыми и всесторонними.

Вторая глава диссертации называется **“ОПРЕДЕЛЕНИЕ И СОПУТСТВУЮЩЕЕ ИССЛЕДОВАНИЕ ЛИЧНОСТНЫХ КАЧЕСТВ РОДИТЕЛЕЙ”.** Эта глава состоит из двух основных параграфов. Первый параграф называется “Определение и влияние личных качеств родителей. Личностные качества родителей относятся к физиологическим, психологическим, культурным, социальным, поведенческим и другим характеристикам родителей в семейном воспитании. Эти характеристики играют жизненно важную роль в росте и развитии детей. От моделей поведения детей до привычек учебы, от процессов социализации до зависимости от технологий - личные качества родителей могут оказывать глубокое влияние как прямым, так и косвенным образом. Уровень образования является важной частью личных качеств родителей и напрямую влияет на их образовательные концепции, родительские установки и семейную атмосферу.

Второй параграф называется “Обзор соответствующих исследований личных качеств родителей” Научные исследования личных качеств родителей относительно обширны и охватывают многие аспекты влияния родителей на развитие детей. Ниже приводится обзор соответствующих исследований в некоторых ключевых областях:

Многие исследования показали, что уровень образования родителей является одним из наиболее важных факторов, влияющих на рост детей. Родители с более высоким уровнем образования обычно обладают более богатыми знаниями и могут обеспечить своим детям качественную образовательную поддержку. Они с большей вероятностью поймут потребности детей на ранних стадиях развития и примут соответствующие образовательные стратегии.

Третья глава диссертации называется “ ВЛИЯНИЕ ЛИЧНОСТНЫХ КАЧЕСТВ РОДИТЕЛЕЙ НА КОМПЬЮТЕРНУЮ ЗАВИСИМОСТЬ ДЕТЕЙ ДОШКОЛЬНОГО ВОЗРАСТА“. Эта глава состоит из пять основных параграфов. Первый параграф называется “Влияние уровня образования родителей на компьютерную зависимость детей дошкольного возраста”.

Уровень образования родителей обычно влияет на их понимание и управление ранним развитием детей, что, в свою очередь, оказывает глубокое влияние на поведение детей при использовании компьютера. Во-первых, родители с более высоким уровнем образования, как правило, обладают более высокими знаниями и технологической грамотностью, а также способны идентифицировать и понимать многочисленные функции и потенциальные риски компьютеров и других цифровых устройств. Что еще более важно, они знают, как использовать эти инструменты для содействия обучению и росту детей. В то же время родители с высшим образованием уделяют больше внимания установлению четких правил и ограничений по времени использования детьми компьютера. С другой стороны, родители с низким уровнем образования могут не до конца осознавать глубокое влияние использования компьютера на развитие своих детей из-за отсутствия у них глубокого понимания цифровых технологий. И у родителей с низким уровнем образования может не быть четких правил по ограничению времени использования детьми компьютера, что может легко привести к тому, что дети без присмотра станут зависимы от компьютеров и даже могут сформировать интернет-зависимость или пристрастие к играм. Эта разница не только отражается в конкретной практике семейного образования, но и отражает принятие родителями образовательных технологий и цифровых ресурсов. Высокообразованные родители, как правило, проводят больше времени на образовательных платформах, чтобы выбрать ресурсы, подходящие для их детей, тогда как родители с низким уровнем образования могут быть более небрежными в своем выборе и легко полагаться на популярный развлекательный контент в интернете.

Второй параграф называется «Влияние технологической грамотности родителей на компьютерную зависимость детей дошкольного возраста”. Технологическая грамотность родителей играет решающую роль в формировании привычек использования детьми компьютера. Технологическая грамотность означает способность человека понимать, использовать и управлять технологическими инструментами, а грамотность родителей в этой области напрямую влияет на то, как они направляют своих

детей в использовании технологий. Родители, которые более технологически грамотны, зачастую лучше способны определить преимущества и потенциальные риски технологических продуктов, выбрать подходящий цифровой контент для своих детей и принять эффективные меры по управлению временем, проведенным их детьми перед экраном. Родители с низкой технологической грамотностью могут иметь определенные «слепые пятна» при выборе технологических продуктов и управлении поведением своих детей при их использовании, что может привести к чрезмерной зависимости их детей от технологических продуктов и повлиять на их физическое и психическое здоровье и развитие.

Третий параграф называется «Влияние стиля воспитания родителей на компьютерную зависимость детей дошкольного возраста". Снисходительному стилю воспитания родителей не хватает адекватной структуры и контроля, что позволяет детям пользоваться компьютером без четких ограничений по времени или фильтрации контента. Без вмешательства и руководства родителей дети могут быть более восприимчивы к чрезмерному использованию технологий. Например, ребенок может проводить так много времени в социальных сетях, играх или видео, что пренебрегает школьными занятиями и другими полезными для здоровья интересами. Авторитетные родители не только сосредотачиваются на предоставлении своим детям достаточной автономии, но также помогают своим детям развить здоровые привычки использования компьютера и снизить вероятность технологической зависимости посредством четких ограничений и надлежащего надзора. Авторитарные родители часто принимают строгие меры контроля и устанавливают множество правил и ограничений, особенно когда дело касается использования технологий, часто применяя очень строгий контроль времени и проверку контента. Хотя этот подход может в краткосрочной перспективе ограничить чрезмерное использование детьми технологических продуктов, его чрезмерный контроль может вызвать другие проблемы, особенно если за детьми отсутствует эффективный надзор.

Строгие ограничения авторитарного родителя могут заставить детей чувствовать себя ограниченными, и они могут бунтарски активнее использовать технологии, особенно без родительского контроля. Например, родители могут полностью запретить своим детям играть в игры или пользоваться Интернетом, но такой чрезмерный контроль часто приводит к тому, что дети ищут возможности тайно использовать устройства без присмотра родителей и даже могут стать чрезмерно зависимыми от технологических продуктов.

четвертый параграф называется «Влияние экономического положения семьи на компьютерную зависимость детей дошкольного возраста". Родители в семьях с высоким и низким доходом, сталкиваясь с различными проблемами управления временем, могут не суметь адекватно контролировать использование технологий своими детьми из-за нехватки времени. Родители из семей с высоким доходом обычно работают сверхурочно и имеют меньше

времени на общение со своими детьми. Отсутствие присмотра может привести к тому, что дети потеряют способность контролировать использование технологических продуктов. Родители из семей с низким доходом испытывают большее финансовое давление; может не хватать времени и ресурсов, чтобы уделять внимание жизни детей и развлекательному контенту, что может легко привести к чрезмерной зависимости детей от продуктов развлекательных технологий и формированию технологической зависимости.

Пятый параграф называется «Влияние психологических качеств родителей на компьютерную зависимость детей дошкольного возраста". Психическое здоровье родителей, особенно эмоциональная стабильность и способность справляться со стрессом, играют важную роль в воспитании детей. Психологическое благополучие родителей оказывает прямое влияние на то, как они справляются с родительским стрессом, а также на то, как они устанавливают правила, управляют поведением своих детей и используют медицинские технологии. Родители, которые эмоционально стабильны и могут эффективно справляться со стрессом, могут обеспечить своим детям стабильную и здоровую среду для роста. Родителям с плохим психическим здоровьем, нестабильными эмоциями или длительным высоким давлением часто не хватает терпения и энергии для эффективного управления воспитанием, и они могут полагаться на технологические продукты, чтобы уменьшить собственное родительское бремя, тем самым увеличивая потребность своих детей в этих продуктах. зависимость.

Выводы, сделанные по диссертационной работе, следующие:

В данном исследовании изучая взаимосвязь между компьютерной зависимостью дошкольников и личностными качествами их родителей, а также такие факторы, как уровень образования родителей, техническая грамотность, стиль воспитания, экономический статус семьи и психологические качества играют ключевую роль в формировании детской личности. поведение и зависимость от использования компьютера. На основе анализа этих факторов в исследовании сделаны следующие основные выводы:

Уровень образования и технологическая грамотность родителей существенно влияют на поведение детей при использовании компьютера : родители с более высоким уровнем образования и технологической грамотностью обычно лучше могут научить своих детей рационально использовать технологические устройства, контролировать время проведенное перед экраном и уменьшить ненужное воздействие развлекательного контента. Такие родители более склонны выбирать для своих детей образовательные приложения, чтобы предотвратить компьютерную зависимость.

Стиль воспитания родителей играет важную роль в формировании технологической зависимости детей: авторитетный стиль воспитания может эффективно подавлять зависимость детей от компьютеров, устанавливая четкие правила использования и предоставляя

соответствующую автономию. И наоборот, либеральное или авторитарное воспитание может усугубить проблемы компьютерной зависимости у детей.

Экономический статус семьи влияет на доступ детей к технологическим устройствам и частоту их использования: дети с лучшими семейными экономическими условиями обычно подвергаются воздействию большего количества технологических устройств. Хотя это обеспечивает хорошие условия для обучения, это также увеличивает риск зависимости детей. Дети из малообеспеченных семей могут быть более склонны заниматься развлекательными мероприятиями с ограниченными возможностями использования устройств.

Психологическое качество родителей влияет на взаимодействие родителей и детей и возможности управления технологиями: родители со стабильными эмоциями и высоким психологическим качеством могут поддерживать хорошее взаимодействие со своими детьми и помочь своим детям сформировать здоровые привычки использования технологий. В ситуациях сильного психологического стресса или эмоциональной нестабильности родители могут больше полагаться на технологические устройства как на «электронных нянь», тем самым увеличивая риск зависимости у детей.

Разумные меры образовательного вмешательства и системы социальной поддержки могут эффективно предотвратить компьютерную зависимость детей дошкольного возраста: повышая технологическую грамотность родителей, предоставляя научные рекомендации для родителей, оптимизируя правила использования технологий в образовательных учреждениях и способствуя формулированию политики на социальном уровне, мы можем эффективно снизить зависимость детей дошкольного возраста. зависимости от технологических продуктов и помочь им расти здоровыми.

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ВНУТРЕННЯЯ ВЕРТИКАЛЬНАЯ ИНТЕГРАЦИЯ И ДИНАМИЧЕСКОЕ ЦЕНООБРАЗОВАНИЕ: ОПЫТ TESLA

Аннотация. *Конкурентная среда на мировом рынке электромобилей становится все более сложной. Активная ценовая политика и агрессивный сбыт продукции некоторых китайских компаний позволил им нарастить свою рыночную долю. В таких условиях все более актуальными становятся исследования, посвященные вертикальной интеграции и ценообразованию в отрасли. Эмпирический анализ позволяет не только констатировать факты, выдвигать гипотезы, но и выявлять актуальные тенденции в их динамике. В статье исследованы особенности «внутренней вертикальной интеграции» известной американской компании Tesla, позволившей ей снизить зависимость от контрагентов. С другой стороны, практика «прямых продаж» автомобилей Tesla дает ей определенные преимущества перед конкурентами. Особое внимание автор обращает на практику «плавающих» цен продукции компании, ее достоинства и недостатки.*

Ключевые слова: *вертикальная интеграция, производство, ценообразование, прямые продажи, Tesla.*

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INTERNAL VERTICAL INTEGRATION AND DYNAMIC PRICING: THE TESLA EXPERIENCE

Abstract. *The competitive environment in the global electric vehicle market is becoming increasingly complex. Active pricing policies and aggressive sales of products by some Chinese companies have allowed them to increase their market share. In such conditions, studies devoted to vertical integration and pricing in the automotive industry are becoming increasingly relevant. Empirical analysis allows not only to state facts and put forward hypotheses, but also to identify current trends in their dynamics. The article examines the features of the "internal vertical integration" of the well-known American company Tesla, which allowed it to reduce its dependence on contractors and suppliers. On the other hand, the practice of "direct sales" of Tesla cars gives it certain advantages over competitors. The author*

pays special attention to the practice of "floating" prices for the company's products, its advantages and disadvantages.

Keywords: *vertical integration, manufacturing, pricing, direct sales, Tesla.*

Проблемы реализации интеграционных стратегий в современных условиях привлекают внимание многих теоретиков и практиков. Так, А.С. Акентьев, Л.А. Федорова глубоко исследовали «..механизмы интеграции образования, науки и производства. Проведен анализ результатов деятельности механизмов интеграции образования, науки и производства наукоемких отраслей» [1].

М.Н. Рудаков, Я.М. Кестер утверждают, что «..экономическая активность выходит за пределы национальных экономик благодаря межнациональным методам коммуникации, позволяющих подключаться к глобальной системе производства». М.Н. Рудаков, Я.М. Кестер рассматривают «возможности глобализации и интеграции в контексте выбора места производства продукции и производителя» [11].

О.П. Добровольская, Н.В. Колодина вполне обоснованно утверждают, что «..интеграция науки и производства является необходимым условием развития инновационной экономики. Совместное использование потенциала научных и производственных организаций позволяет достигать эффективных результатов в проведении научных исследований, внедрении научно-исследовательских и опытно-конструкторских разработок, способствует совершенствованию производственных процессов» [5].

С другой стороны, торговые войны, повышение импортных пошлин, факторы геополитического характера оказывают существенное влияние на сбыт продукции автопроизводителей, актуализируя разработки в области ценовой политики. Так, К.Д. Ивкин исследовал «..влияние пандемии на рост цен автомобилей на мировом рынке, выявил существенные изменения в стоимости машин многих автомобильных брендов. Были выявлены главные причины, повлиявшие на ценовую политику автомобильных производителей после пандемии» [6].

Е.А. Травкина констатирует: «Ценовая политика предприятия является одним из существенных элементов его деятельности, влияющим на экономические результаты и конкурентоспособность. Исследование ценовой политики предприятия представляет актуальную проблему как с практической, так и с теоретической точек зрения». Е.А. Травкина в свою очередь утверждает, что «..рациональное формирование ценовой политики позволяет предприятию адаптироваться к изменениям на рынке, эффективно конкурировать и обеспечивать свое финансовое благополучие» [12].

А. Алмырадов, Р. Аманмырадов утверждают, что «..ценовая политика компании является одним из ключевых факторов, напрямую влияющих на её финансовые результаты. Выбор оптимальной стратегии ценообразования позволяет компании не только укреплять позиции на рынке, но и обеспечивать

стабильный рост прибыли, повышение рентабельности и улучшение других финансовых показателей» [2].

А.А. Разина предприняла попытку доказать, что «..ценовая и сбытовая политика оказывает влияние на прибыль и конкурентоспособность предприятия.. При этом необходимо анализировать и оценивать в целом работу с товарами – от момента производства до сбыта» [10].

А.С. Гусарова провела детальный анализ «..влияния цены на способность реализации продукции». При существующей неопределенности в сбыте, порожденной внешней средой, автор рекомендует «..использовать ценовую политику для снижения риска невостребованности продукции» [4].

И.И. Полещук, Т.В. Кузнецова исследовали динамику цен как один из факторов сбытовой политики предприятия, обосновав ряд практических рекомендаций [8].

А.В. Гришин провел интересный сравнительный анализ особенностей автомобильной промышленности ряда мировых кластеров. Автор утверждает: «Несмотря на благоприятные прогнозы продаж, на рынке США проблемы сохраняются, – из-за высоких процентных ставок, жестких условий кредитования, медленной корректировки цен на новые автомобили» [3].

Действительно, современные сбои в цепочках поставок, проблемы с ликвидностью, изменение поведения клиентов оказывают влияние на выбор метода ценообразования, оптимального для отрасли и локального рынка.

Один из традиционных методов установления цены продукции – так называемый «себестоимость плюс» (или «затраты плюс») – предполагает ценообразование на основе себестоимости производства, продажи готовой продукции, маржи участников. Этот метод имеет ряд достоинств, но одновременного ограничивает гибкость продавца в принятия оперативных решений. На первом этапе метод предполагает оценку полной себестоимости продукции (включая материалы, рабочую силу, накладные затраты), а затем добавляют заранее определенный процент маржи. Обратный этому подход «цена рынка минус средняя наценка посредников» также может быть применен в рассматриваемой отрасли.

Иной распространенный в автомобильной промышленности метод – «на основе ощущаемой ценности» товара, базируется на оценке готовности клиента платить «за превосходный опыт» при покупке услуги или продукта. Стратегия на основе ценности позволяет производителям продлить жизненный цикл существующих продуктов. Цены устанавливаются на основе того, насколько потребители ценят конкретный (часто – престижный) автомобиль, и готовы оплачивать эту ценность.

Большинство автопроизводителей традиционно пересматривают свои прайс-листы не чаще одного раза в квартал (иногда – в год). Во многом это обусловлено сложностью взаимоотношений и координации решений с дистрибьюторами и дилерами.

Модели динамического («плавающего») ценообразования применяют на практике лишь отдельные представители отрасли. Издержки, предложение и спрос при этом учитываются. но не становятся решающими [13].

Один из автопроизводителей, давно применяющий такой подход – компания Tesla, Inc., была зарегистрирована в 2003 году, ее штаб-квартира находится в Остине, штат Техас, США. Компания работает в двух сегментах: автомобильная промышленность; производство и хранение энергии. Tesla проектирует, разрабатывает, производит, сдает в аренду и продает электромобили, а также системы производства и хранения энергии в США, и за рубежом [7].

Используя прямые продажи, динамическое ценообразование, услуги с дополнительной маржой, Tesla зарекомендовала себя как новатор в сбыте электромобилей.

В целом успешный бизнес Tesla не избежал проблем. В апреле 2024 г. компания объявила о сокращении десяти процентов персонала. В первом квартале 2025 года выручка компании снизилась на девять процентов, по сравнению с тем же периодом 2024 г., причем выручка от продаж автомобилей упала на 20% из-за возросшей конкуренции со стороны производителей недорогих электромобилей в Китае [13].

Скептицизм инвесторов Tesla, сосредоточенных на фундаментальных показателях бизнеса, во многом оправдан. Компания не смогла выпустить доступные новые модели электромобилей, в то время как китайские конкуренты, такие как BYD, насыщают рынок, особенно в Европе.

Аналитики фондового рынка снизили целевую цену акций Tesla из-за прогноза на 2025 год. Продажи компании в Европе в апреле 2025 г. снизились на 50% по сравнению с прошлым годом, а в мае — еще на два процента. Продажи в Китае за эти два месяца снизились примерно на 20% по сравнению с прошлым годом. Качество продукции также оказывает влияние. Tesla объявила о восьми добровольных отзывах Cybertruck за 15 месяцев из-за ряда технических проблем [14].

Tesla практически применяет модель «внутренней вертикальной интеграции». Это дает компании контроль над критически важными процессами, позволяет быстро реагировать на требования рынка. «Гиперфабрики» (англ. «Gigafactory») компании Tesla являются основой цепочки поставок. Такие производства расположены в Неваде, Шанхае, Берлине, Остине, исходя из близости ключевых рынков. Они позволяют минимизировать затраты, связанные с логистикой и товарными запасами. Каждая гиперфабрика концентрирует различные виды деятельности, – от производства аккумуляторных батарей, до сборки электромобилей. Одновременно на их базе работают центры исследований и разработок. Способность компании тиражировать Gigafactorys стала основой ее масштабирования [7].

Вертикальная интеграция позволяет Tesla управлять ключевыми компонентами цепочки поставок внутри компании, снижая зависимость от

внешних партнеров. Эта стратегия проявляется в том числе в прямом контроле над производством аккумуляторов, и сети Gigafactory, которая объединяет несколько этапов производства под одной крышей.

Эта система позитивно проявила себя в период COVID-19. Многие автопроизводители столкнулись с длительными простоями из-за проблем с цепочкой поставок, а Tesla быстро адаптировалась, закупая компоненты у альтернативных поставщиков и корректируя свои производственные процессы [14].

Одной из отличительных особенностей Tesla является модель продаж непосредственно потребителю (прямые продажи). Обходя традиционные дилерские сети, Tesla устраняет дилерские наценки и сохраняет контроль над ценообразованием. Прямые продажи через онлайн-платформы и магазины, принадлежащие Tesla, упростили процесс, снизили затраты и дали Tesla контроль над сбытом продукции. Такая модель обеспечивает бесперебойный процесс онлайн-покупок, гибкость быстрой корректировки цен, в ответ на динамику рынка. Клиенты конфигурируют автомобили онлайн, используя прозрачный процесс ценообразования.

Компания при этом применяет дифференцированное ценообразование – флагманские модели компании, такие как Model S и Model X, ориентированы на сегмент класса люкс, Model 3 и Model Y больше предназначены для преимущественно массового рынка.

Несколько лет подряд Tesla применяла методы «премиального» ценообразования, – в сочетании с высоким качеством продукции. Tesla изначально не планировала производство бюджетных электромобилей, позиционируя свою продукцию как премиальную. Важным элементом корпоративной бизнес-модели компании была так называемая стратегия «снятия сливок». Она включала установку высоких цен на первые автомобили, такие как Roadster и Model S. Модель Roadster (стоимостью от 109 до 170 тысяч долларов США), так как ориентировалась на конкретную рыночную «нишу». Высокий ценник отражал высокий уровень технологий. Этот подход предполагал установление высоких цен для привлечения состоятельных потребителей, которые ценят роскошь и технологичность. такая стратегия позволила Tesla быстро окупить первоначальные инвестиции, укрепить узнаваемость и престиж бренда, заложив основу для последующей корректировки цен, – по мере выхода на более широкий рынок. Высокие цены помогли Tesla возместить масштабные инвестиционные затраты на исследования и разработки.

Позднее Tesla стала практиковать так называемое «динамическое» ценообразование, систему «плавающих» цен. Такой подход отличает Tesla от конкурентов, отражая ее способность адаптироваться на быстро развивающемся рынке электромобилей. Цена продукта Tesla нестабильна, иногда может измениться несколько раз за месяц.

Частые корректировки цен вызывают критику, некоторые клиенты выражают разочарование из-за внезапного снижения цен после совершения

ими покупки. Зато с позиций менеджмента это повышает степень адаптивности компании. Способность Tesla быстро корректировать цены позволяет ей оперативно реагировать на меняющиеся рыночные условия в режиме реального времени. Когда спрос высок, Tesla повышает цены, максимизируя доходы. И наоборот, в периоды замедления компания снижает цены, стимулируя спрос [13]. Таким образом, корректировка цен помогает Tesla согласовывать производство с динамикой спроса, избегая локального перепроизводства или дефицита – это положительно влияет в том числе на оборачиваемость запасов готовой продукции.

С другой стороны, частые корректировки цен подрывают доверие потребителей, повышают впечатление нестабильности [14]. Они создают неопределенность для потенциальных покупателей. Динамичное ценообразование Tesla зачастую воспринимается потребителями как неустойчивое. Постоянные корректировки цен негативно влияют на лояльность клиентов. Следовательно, подход Tesla к ценообразованию обеспечивает гибкость, но создает проблемы, связанные с восприятием потребителя и прозрачностью.

Проведенный анализ позволил эмпирически выявить особенности внутренней вертикальной интеграции крупного современного автопроизводителя, проблемы функционирования компании, некоторые достоинства и недостатки корпоративной модели «динамического» ценообразования.

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ВАЖНОСТЬ ПРЕПОДАВАНИЯ СОЦИАЛЬНО-ГУМАНИТАРНЫХ НАУК

Аннотация: *В данной статье показана растущая потребность в образовании и воспитании молодежи в процессе глобализации, раскрываются основные принципы формирования будущего поколения, а также подчеркивается роль социально-гуманитарных наук в этом процессе.*

Ключевые слова: *всесторонне развитый, мышление, молодежь, образование, общественных наук, мировоззрение, потенциал, высшее образование, профессия.*

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THE IMPORTANCE OF TEACHING SOCIAL SCIENCES AND HUMANITIES

Annotation: *This article highlights the increasing need for youth education and upbringing in the context of globalization, outlines the main principles of shaping the future generation, and emphasizes the role of social and humanitarian sciences in this process.*

Key words: *comprehensively developed, thinking, youth, education, social sciences, worldview, potential, higher education, profession.*

В процессе глобализации растет потребность в укреплении человеческого капитала, в связи, с чем возникает необходимость глубокого анализа основных факторов его полноценного формирования. В основе этих факторов лежит качественное образование и воспитание. Глубокие знания всегда были отличительным механизмом совершенствования человеческого капитала.

Именно поэтому в последние годы, с целью всестороннего развития нашей страны и создания Нового Узбекистана, наряду со всеми сферами, в системе образования проводятся кардинальные реформы. В этом направлении были приняты десятки важных указов, постановлений, концепций и программ.

В Стратегии развития Нового Узбекистана вопрос молодежи признается одним из важнейших приоритетных направлений. В этом процессе социально-гуманитарные науки играют важную роль в формировании молодежи как духовно-нравственной, интеллектуальной и социально зрелой личности. Потому что именно благодаря этим наукам достигается формирование человеческого мышления, системы ценностей, исторической памяти, национального самосознания и гражданского сознания.

Относительно сложившегося в настоящее время мнения о значении социально-гуманитарных наук, наш Президент Ш.М. Мирзиёев в своей работе «Стратегия развития Нового Узбекистана» высказывает следующие мысли: «У нас на протяжении многих лет по отношению к социальным наукам сформировался односторонний технократический подход, своего рода «чужое» отношение к вопросам в этой области» [1].

Действительно, в последнее время мы наблюдаем формирование подобных мнений в отношении этих наук, которые играют важную роль в понимании человеческого мышления, развития общества и культуры. На самом деле, о важности социально-гуманитарных наук было высказано достаточно мнений многими известными людьми.

В обсуждениях современного аналитического сообщества о балансе между наукой и гуманитарными науками, опираясь на идеи Эйнштейна, обобщается точка зрения: «Наука создает технологии, но только гуманитарные науки учат, как их использовать». Индийский мыслитель и политик Махатма Ганди также подчеркивал важность гуманитарных наук в своем высказывании: «Истинный прогресс человечества достигается не техникой, а моралью и духовностью».

Как отмечал по этому поводу наш Первый Президент И.А. Каримов: «В условиях сегодняшней глобализации и информационных атак воспитание молодого поколения как гармонично развитых, самостоятельно мыслящих, социально ответственных и духовно зрелых личностей является одной из приоритетных задач системы образования. Особенно неоценима роль социально-гуманитарных наук в этом процессе. Именно благодаря этим наукам достигается формирование социального сознания, гражданской позиции, морально-нормативных взглядов личности» [2].

Так какие же учебные программы следует использовать для обучения современной молодежи, и на каких принципах следует ее воспитывать? Какие науки им нужно глубоко изучать? Эти вопросы являются одними из важнейших проблем современности. А можно ли вообще делить науки на «нужные» и «ненужные»? Вопрос о необходимости наук – одна из малоизученных тем в современной прессе. С этой точки зрения, ее изучение в последнее время считается актуальной задачей.

В настоящее время в мировом масштабе наблюдаются тенденции системного подхода к вопросам совершенствования наук и развития системы образования.

Наш Президент по этому поводу высказал следующие мысли: «К сожалению, следует отметить, что до сих пор нет целостной концепции относительно того, в каком объеме и по каким направлениям, в какой форме и с каким содержанием следует преподавать и изучать общественные науки на всех этапах непрерывного образования, особенно в системе высшего образования» [3].

Продолжая свою мысль, он говорит: «К сожалению, в результате неверных взглядов некоторых недальновидных чиновников, таких как «от социальных наук нет пользы», было допущено снижение веса и качества этих наук» [3].

Исходя из вышесказанного, можно наблюдать, что образование и воспитание всегда были важнейшими вопросами на протяжении исторического развития, и для их правильного решения все более актуальным становится более глубокое изучение социальных наук. Так что же дают социальные науки молодому поколению? Чему они могут научить?!

Во-первых, поскольку социально-политическое представление и мировоззрение молодежи еще не полностью сформированы, вероятность их попадания под влияние чуждых идей выше. С этой точки зрения, механизм эффективного использования молодого поколения – важной силы для стабильности и развития страны – изучается в рамках социальных наук.

Во-вторых, в настоящее время, когда ощущается потребность в укреплении человеческого капитала, для воспитания высокоинтеллектуального поколения, которое будет служить процветанию страны, необходимо формировать в их мышлении твердую гражданскую позицию и способность находить свое «я». Эти усилия также реализуются через преподавание социальных наук.

В-третьих, «Мы должны подготовить поколение, овладевшее современными знаниями и технологиями. Несомненно, естественно-технические и специальные науки являются основным фактором для подготовки таких специалистов. Но достаточно ли этих наук для воспитания нового поколения как зрелых людей, которые учитывают интересы народа и общества, нации и государства, видят себя едиными с интересами страны, чувствуют свою причастность к реформам и свою социальную ответственность? Конечно, нет» [3].

В-четвертых, национальное самосознание, преемственность наследия предков являются основным критерием обеспечения мира в стране в процессе развития. Конечно, национальное самосознание характеризуется глубоким знанием истории своей Родины. Ведь «Только тот, кто внимательно смотрит на историю, всегда живет бдительно и настороженно. Он может объективно и правдиво оценить как сегодняшнюю ситуацию, так и будущие процессы. А это является важнейшим условием обеспечения мира и стабильности, достижения высокого развития в наше сложное и стремительное время» [3].

В-пятых, обучающаяся молодежь – это будущие специалисты. В рамках своей профессии они общаются с очень многими людьми. Социальные науки

относятся к числу основных наук, глубоко изучающих культуру общения и применяющих ее в жизни.

Социально-гуманитарные науки – это комплекс наук, изучающих такие основные понятия, как человек и общество, ценности и мышление, права и обязанности, культура и история. Эти науки формируют у молодежи следующие социально-мыслительные навыки:

- **Критическое мышление и анализ:** способность анализировать информацию, оценивать ее достоверность и формировать собственное мнение.
- **Социальная ответственность:** осознание своей роли в обществе и готовность к активному участию в его развитии.
- **Межкультурное понимание:** уважение к различным культурам и традициям, способность к эффективной коммуникации в многонациональной среде.
- **Решение проблем:** умение выявлять социальные проблемы, предлагать пути их решения и принимать обоснованные решения.
- **Эмпатия и толерантность:** способность понимать чувства и переживания других людей, проявлять терпимость к различиям.

Кроме того, благодаря этим наукам молодежь приобретает навыки понимания, оценки и решения социальных проблем, возникающих в обществе [4].

Также социально-гуманитарные науки являются важной платформой для воспитания молодежи как зрелых личностей, способных обоснованно выражать свое мнение, анализировать и дискутировать [5].

Исследователь У.М. Мавлонов отмечает: «...для нашего государства, стремящегося к построению демократического государства и гражданского общества, духовное воспитание молодежи приобретает важное стратегическое значение», и мы считаем, что в достижении этих стратегических целей значение социально-гуманитарных наук очень велико [6].

В заключение следует отметить, что социально-гуманитарные науки занимают значительное место в духовном и социальном воспитании молодежи. Преподавание этих наук на основе современных подходов, усиление их не только теоретического, но и практического, воспитательного значения – важный фактор, способствующий развитию личности. Благодаря такому подходу мы сможем воспитать социально сознательное, патриотичное, мыслящее поколение.

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РОЛЬ И ЗНАЧЕНИЕ МАРКЕТИНГА В СФЕРЕ СТРОИТЕЛЬСТВА И ЭКСПЛУАТАЦИИ ИНЖЕНЕРНЫХ КОММУНИКАЦИЙ

Аннотация: *В работе рассматриваются теоретические вопросы осуществления маркетинговой деятельности российскими организациями инженерно-коммунальной сферы.*

Ключевые слова: *сфера строительства и эксплуатации инженерных коммуникаций; маркетинг; маркетинговая деятельность; система менеджмента качества.*

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THE ROLE AND IMPORTANCE OF MARKETING IN THE FIELD OF CONSTRUCTION AND OPERATION OF ENGINEERING COMMUNICATIONS

Annotation: *The paper examines theoretical issues of marketing activities carried out by Russian organizations in the engineering and public utilities sector.*

Key words: *sphere of construction and operation of engineering communications; marketing; marketing activities; quality management system.*

Исследователи определяют маркетинг «как систему управления, обеспечивающую целенаправленное взаимодействие с рынком, способствующую достижению устойчивых конкурентных преимуществ за счёт адекватного позиционирования, адаптации к внешней среде и формирования лояльности со стороны целевой аудитории» [6]. Общеизвестно, что сфера строительства и эксплуатации инженерных коммуникаций представляет собой высокоспециализированный сегмент, отличающийся комплексностью проектной структуры, многоуровневым характером оказания услуг и высокой степенью нормативной регламентации [5,7].

Отраслевые компании, работающие в сфере строительства объектов, так и на стадии их последующей технической эксплуатации, функционируют

преимущественно в рамках B2B-модели, где ключевыми субъектами взаимодействия являются институциональные заказчики (девелоперы, подрядные строительные структуры, управляющие компании и т.п.). При формировании взаимодействия с ними необходимо учитывать удлинённый цикл принятия решений (от первого коммерческого контакта до заключения договора могут пройти месяцы). Более того, решение о выборе подрядчика принимается группой специалистов, в которую входят инженеры, проектировщики, представители службы закупок, юристы и т.п.

В отличие от B2C-сектора, где акцент делается на эмоциональную составляющую и брендинг, в строительной и инженерно-эксплуатационной сфере велико значение показателей надежности, прозрачности ценообразования, соответствия действующим нормативам (в т.ч. в направлении соблюдения технических регламентов и требований охраны труда), а также наличие опыта работы с объектами различной степени сложности [8,11,13].

Дополнительная специфика маркетинговой деятельности в сфере строительства и эксплуатации инженерных коммуникаций предопределена высоким уровнем конкуренции, в т.ч. со стороны узкопрофильных и региональных подрядчиков, которые нередко прибегают к демпинговым стратегиям, не обеспечивая должного уровня сервиса и сопровождения. В такой ситуации маркетинг выполняет не только информативную, но и защитную функцию, позволяя подчеркнуть наличие у организации квалифицированного персонала, необходимых лицензий, соответствия стандартам СМК, а также развитой цифровой инфраструктуры (систем диспетчеризации, сквозной отчётности, интегрированной CRM) [3,12].

На основе рассмотренных положений представляется обоснованным структурировать ключевые функции маркетинга в сфере эксплуатации инженерных коммуникаций и подрядного строительства (табл.1).

Таблица 1– Структура и содержание маркетинговых функций в сфере строительства и эксплуатации инженерных коммуникаций

Направление воздействия	*Содержание функции*	*Практическое значение для подрядчика*
Стратегическое позиционирование	Формирование имиджа надёжного исполнителя, устойчивого бренда	Увеличение доверия со стороны заказчиков, повышение конкурентоспособности на тендерах
Коммуникационное сопровождение	Многоканальное взаимодействие с профессиональной аудиторией (PR, сайт, кейсы)	Ускорение цикла сделки, повышение отклика на предложения, усиление лояльности
Продвижение услуг	Представление сервисного портфеля, кейсов, лицензий, технологических преимуществ	Повышение видимости компании в отраслевых медиа, на платформах и выставках
Аналитическая функция	Сбор и анализ данных о рынке, конкурентах, запросах целевой аудитории	Адаптация ценовой и сбытовой политики, ориентация на актуальные потребности сегментов
Интеграция с бизнес-процессами	Связь маркетинга с CRM, KPI, документооборотом	Создание сквозной воронки взаимодействия, сокращение издержек, рост управляемости продажами
Репутационно-юридическая защита	Подтверждение компетентности (участие в СРО, лицензии, ISO, отзывы, показатели надёжности)	Выигрыш в условиях высокой конкуренции и демпинга, защита от субъективных рисков

Таким образом, функциональное наполнение маркетинга в инженерно-строительной сфере представляет собой целостную систему согласования интересов всех участников рыночного обмена через механизмы анализа, коммуникации и управления ценностью, которая включает в себя сопровождение тендерных процедур в соответствии с требованиями федерального законодательства, ведение технической документации, организацию отчётности, подтверждение квалификации и систем управления качеством (например, на основе стандартов ISO 9001) [1,2,3,15].

Реализация элементов маркетингового комплекса строительных организаций сконцентрирована, прежде всего, на этапах конкурсного отбора, презентации проектных решений и обоснования технико-экономических показателей. Маркетинг в данном контексте обеспечивает механизм институционального доверия, который позволяет подрядной организации подтвердить свою способность обеспечить выполнение обязательств, соблюдать установленные регламенты, поддерживать прозрачность документооборота и осуществлять сопровождение клиента на всех этапах жизненного цикла проекта [3; 14]. Это определяет содержание маркетинговых инструментов – от подготовки конкурсной документации и BIM-визуализаций

до сопровождения на этапе государственной экспертизы и обзора практики в профессиональной среде.

Продуктовая политика подрядных организаций, действующих в сфере строительства и эксплуатации инженерных коммуникаций, формируется на стыке проектной проработки, нормативных требований и ожиданий институциональных заказчиков. В строительстве «продукт» чаще всего представлен не отдельной услугой, а интегрированным решением (от разработки проектной документации до авторского и технического надзора). Это может включать выполнение функций генерального подрядчика, реализацию объекта «под ключ» с последующей передачей на эксплуатацию, а также согласование инженерных решений с органами надзора и заказчиком.

В инженерной эксплуатации аналогичная интеграция выражается в сервисных пакетах, включающих регламентное обслуживание систем жизнеобеспечения, мониторинг технических параметров, аварийное реагирование, санитарную очистку и фотодокументирование. Ключевая особенность – привязка всех сервисных операций к SLA (Service Level Agreement), что придаёт услуге нормативную измеримость и обеспечивает контроль со стороны заказчика.

Особое значение в обоих направлениях приобретает соответствие стандартам качества, таким как ISO 9001, что подтверждает стабильность процессов и готовность организации к исполнению обязательств в рамках сложных контрактов. Это особенно актуально при реализации проектов в социальной и транспортной инфраструктуре, где ошибки на этапе проектирования или срывы в обслуживании могут иметь критические последствия [3, 10].

В инженерно-строительной сфере происходит «переосмысление» значения и маркетинговых коммуникаций, которые не сводятся к распространению рекламы или массовому привлечению клиентов. Их главная задача – формирование устойчивого позиционирования организации на рынке, демонстрация её репутационной состоятельности и операционной надёжности в глазах профессионального заказчика [11]. Отметим, что ключевыми элементами такого представления выступают визуальная идентичность, портфель реализованных проектов, положительные отзывы, подтверждённый отраслевой опыт, наличие действующих лицензий и членство в профильных объединениях. Особенно значимым в современных условиях становится соответствие компании требованиям цифровизации (наличие CRM-системы, электронной системы документооборота, внедрение инструментов для контроля качества сервиса на всех этапах взаимодействия с заказчиком) [3, 9,10].

Маркетинговые коммуникации, в этой связи, направлены на построение партнёрских отношений, в рамках которых подрядчик способен продемонстрировать ответственность, профессиональную зрелость и технологическую надёжность. Как подчёркивает исследователь, «конкурентоспособность строительной организации определяется не только

качеством предоставляемых услуг, но и способностью убедительно подтвердить своё соответствие нормативным и отраслевым требованиям, продемонстрировать успешные кейсы, наличие профильной экспертизы и прозрачной юридической практики» [5]. По нашему мнению, отражение этих характеристик осуществляется не только через корпоративный сайт, но и через активное участие в профессиональных выставках, публикации в отраслевых СМИ, репрезентативные тендерные пакеты и PR-деятельность, направленную на формирование устойчивого имиджа надёжного делового партнёра [4,8,11].

Обобщая представленную информацию, отметим, что образом, маркетинговая деятельность в сфере эксплуатации инженерных коммуникаций и технического обслуживания зданий выступает важным элементом обеспечения устойчивости бизнеса. Она задаёт стандарты репутационного поведения, регулирует структуру клиентского сервиса, влияет на стратегии участия в конкурсах и тендерах, а также обеспечивает сопровождение полного жизненного цикла контракта – от установления контакта до отчётности по исполнению обязательств. В условиях возрастающей конкуренции и ужесточения нормативных требований маркетинг приобретает системный характер и становится фактором профессиональной надёжности, подтверждаемой не столько словами, сколько делом, документацией и цифровой прозрачностью.

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ЁҒОЧ ҚУРИЛИШ МАТЕРИАЛЛАРИНИ ТАЙЁРЛАШ ЖАРАЁНИДА МЕҲНАТНИ МУҲОФАЗА ҚИЛИШ ҚОИДАЛАРИ ИШЛАБ ЧИҚИШ

Аннотация: *Ушбу мақолада ёғоч қурилиш материалларини тайёрлаш жараёнида меҳнат муҳофазаси қоидаларини ишлаб чиқишга бағишланган бўлиб, бунда ишловчиларни зарарли ва хавфли ишлаб чиқариш муҳити омилларидан ҳимоя қилиш ва улар учун хавфсиз меҳнат шароитларини яратиш бўйича фикр юритилган.*

Калит сўзлар: *касб касаллиги, хавфли омил, зарарли омил, шовқин, тебранма, электр токи уриши, статик ток, ноқулай меҳнат шароити, метеорологик кўрсаткичлар, даволаш-профилактика, маиший хоналар*

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PREPARATION OF WOODEN BUILDING MATERIALS PROTECTION OF LABOR IN THE PROCESS DEVELOPMENT OF RULES

Abstract: *This article is devoted to the development of labor protection rules in the process of manufacturing wooden building materials, which consider the protection of workers from harmful and dangerous factors of the production environment and the creation of safe working conditions for them.*

Keywords: *occupational disease, dangerous factor, harmful factor, noise, vibration, electric shock, static current, unfavorable working conditions, meteorological indicators, treatment and prevention, household premises*

Тўғри ташкил этилган меҳнат кишининг жисмоний, интеллектуал ва маънавий камол топишига олиб келади. Меҳнатнинг хусусияти ёки ишлаб чиқариш шароити одамнинг иш қобилияти ёки соғлигига салбий таъсир қила оладиган ҳоллар ишлаб чиқаришда касбга доир зарарлар борлигидан далолат беради. Касалликнинг пайдо бўлиши ишлаб чиқариш муҳитининг физикавий, кимёвий, биологик омиллар таъсири оқибатида бўлиши мумкин[1,2].

Ҳозирги кундаги меҳнат муҳофазасининг асосий вазифаси иш унумдорлигини энг юқори даражада ошириш ва ишловчиларнинг соғлигига зарарли таъсир қилмайдиган шароитларни таъминлайдиган тадбирларни ишлаб чиқишдан иборатдир.

Ёғоч қурилиш материалларини тайёрлаш жараёнида меҳнатни муҳофаза қилишда шу ерда ишловчи барча ходимларни ўз касблари ва иш турлари бўйича белгиланган тартибда ўқишлари, йўл-йўриқлар олишлари ҳамда билимлари синовдан ўтказилиши ташкилот раҳбарияти зиммасига юклатилади. Бу эса ўз навбатида корхонадаги хавфли ва зарарли ишлаб чиқариш омиллари, уларнинг тавсифи, юзага келиш манбалари, уларнинг ишчиларга таъсир қилиш хусусиятлари ва саломатлик учун хавфлилик даражаси ва келгусидаги оқибатлари тўғрисида тўлиқ маълумотга эга бўлишига олиб келади. Бунда ёғоч ишлаб чиқариш корхонасидаги хавфли ва зарарли меҳнат шароитлари, иш ўринлари ва ҳудудларининг санитария қоидалари ва меъёрларига мувофиқ зарарлилик ва хавфлилик синфи кўрсатилган рўйхатига ҳамда ишлаб чиқариш омилларининг зарарлилик ва хавфлилик кўрсаткичлари бўйича меҳнат шароитларининг амалдаги гигиеник таснифи ишлаб чиқиб барча ходимлар таништирилиш лозим бўлади. Ишловчиларни зарарли ва хавфли ишлаб чиқариш муҳити омилларидан ҳимоя қилиш тегишли стандартлар ва меъёрлар талабларига мос жамоавий ва шахсий ҳимоя воситаларидан фойдаланиш орқали таъминланиши лозим[3,4].

Ёғоч қурилиш материаллари ишлаб чиқариш хоналари ва иш жойларида меҳнат муҳофазаси талабларини ишлаб чиқишда қуйидагиларга аҳамият бериш лозим.

ишлаб чиқариш хоналари ва иш жойларида ҳаво муҳитини нормаллаштириш воситалари (шамоллатиш ва ҳаво тозалаш, иситиш, ҳаво ҳароратини, намлигини бир хил меъёрда сақлаш ва бошқалар);

ишлаб чиқариш хоналари ва иш жойларининг ёруғлигини нормаллаштириш воситалари (ёритиш асбоблари, ёруғлик ўринлари, ёруғликдан ҳимоя қилиш мосламалари ва бошқалар);

шовқин, тебранма, электр токи уриши, статик ток ва ускуналар юзасининг юқори даражадаги ҳароратдан ҳимоя қилиш воситалари;

механик ва кимёвий омилларнинг таъсиридан ҳимоя қилиш воситалари[4,5,6].

Ёғоч қурилиш материаллари ишлаб чиқариш корхоналарида умумжамоа муҳофаза воситалари (вентиляция, аспирация, ерга улаш, маҳаллий сўрғичлар ва бошқалар) зарарли ва хавфли ишлаб чиқариш муҳити

омиллари хонадаги барча ишловчиларга таъсир қилганда қўлланиши мақсадга мувофиқдир.

Агарда умумжамоа муҳофаза воситалари корхонада зарарли ва хавфли омилларни рухсат этилган миқдоргача камайтириш имконини бермаган ҳолларда шахсий ҳимоя воситалари қўлланишга руҳсат берилади. Бундай ҳолларда шахсий ҳимоя воситаларисиз ишчи ходимларини ишлаши тақиқланади.

Ёғоч қурилиш материаллари ишлаб чиқариш корхоналарида меҳнат шароити ноқулай ишларда банд бўлган ходимлар белгиланган нормалар бўйича сут (шунга тенг бошқа озиқ-овқат маҳсулотлари), даволаш-профилактика озиқ-овқати, газли шўр сув (иссиқ цехларда ишловчилар учун), махсус кийим-бош, махсус пойабзал, бошқа шахсий ҳимоя ва гигиена воситалари билан бепул таъминланиши лозим.

Ёғоч қурилиш материаллари ишлаб чиқариш корхоналари ходимлари ишни бажаришнинг хавфсиз усулларига ўқитилиб, олинган билимлари Меҳнат муҳофазаси бўйича ўқишларни ташкил қилиш ва билимларни синаш тўғрисидаги **намунавий низомга** (рўйхат рақами 272, 1996 йил 14 август) мувофиқ синовдан ўтказилгандан сўнг ишлаб чиқариш жараёнида иштирок этишга рухсат этилиши ва ўн саккиз ёшга тўлмаган шахслар меҳнатидан фойдаланишга ҳамда уларнинг юк кўтариши ва ташишига норматив ҳужжатлар талабларига мувофиқ рухсат этилиши лозим[1,2,7,8].

Ёғоч қурилиш материаллари ишлаб чиқариш корхоналари маъмурияти (ёки иш берувчи) касаба уюшмаси қўмитаси ва ваколатли соғлиқни сақлаш органлари билан биргаликда ҳар йили даврий тиббий кўрикдан ўтиши лозим бўлган ходимларнинг рўйхатини тузиши ҳамда ходимларнинг кўрикка келишини таъминлаши лозим.

Корхонада ишлаётган ходимларнинг саломатлигини назорат қилиш ходимларни тиббий кўрикдан ўтказиш тартиби тўғрисидаги **низом** (рўйхат рақами 2387, 2012 йил 29 август) асосида амалга оширилиши лозим.

Корхонада мажбурий тиббий кўрикдан ўтишдан ёки тиббий комиссияларнинг текширувлар натижасида берган тавсияларини бажаришдан бўйин товлаган ходимларни маъмурият ишдан четлаштириши шарт.

Ёғоч қурилиш материаллари ишлаб чиқариш корхоналари бинолари ҚМҚ 2.09.02 “Ишлаб чиқариш бинолари” талабларига мувофиқ лойиҳаланиб,

ўтиш, чиқиш йўллари, коридор, тамбур, нарвонлар турли жисмлар ва асбоб-ускуналар билан тўсиб қўйилишига рухсат этилмайди. Эвакуация чиқиш йўлларининг барча эшиклари бинодан чиқиш йўналиши бўйича очилиши,

ишлаб чиқариш хоналари поллар текис, ёриқларсиз, тешикларсиз ва шишиб чиққан жойлари бўлмаслиги, ҚМҚ 2.03.13 “Поллар” талабларига мувофиқ бажарилган бўлиши лозим бўлади.

Ёғоч қурилиш материаллари ишлаб чиқариш корхоналари биноларида шамоллатиш ва иситиш ҚМҚ 2.04.05-97 “Иситиш, шамоллатиш ва кондиционерлаш” талабига ва бино ва иншоотларнинг ишлаб чиқариш

хоналарида ҳаводаги зарарли моддалар миқдори СанҚваМ 0046-95 “Гигиеник нормативлар. Иш ҳудуди ҳавосида зарарли моддаларнинг рухсат этилган энг кўп миқдорлари” талабларига мувофиқ бўлиши мақсадга мувофиқдир.

Корхонанинг ўтиш жойларида (галереяларда, зиналар майдончаларида ва шунга ўхшаш) жойлашган иситиш жиҳозлари (қувурлар, регистрлар ва шунга ўхшашлар) рухсат этилган ўтиш йўлкаларининг энини камайтирмаслиги керак.

Ёғоч қурилиш материаллари ишлаб чиқариш корхоналари ишчи жойларида ҳаво ҳарорати йилнинг совуқ даврида енгил жисмоний ишларда 21°С, ўрта оғир ишларда 17°С ва оғир ишларда 16°С дан паст бўлмаслиги, ходимларнинг исиниши учун хоналарда ҳаво ҳарорати 22°С дан кам ва биноларда жойлашган ишчи майдонларидан, ходимларнинг исиниш хоналаригача бўлган масофа 75 м, ташкилот майдонидаги ишчи жойларидан 150 м дан кўп бўлмаслиги керак бўлмаслиги лозим[9,10].

Ёғоч қурилиш материаллари ишлаб чиқариш корхоналари сув билан таъминлаш ва канализация тизими ҚМҚ 2.04.01-98 “Биноларнинг ички сув қувури ва канализацияси” талабига мос келиши керак.

Корхонадан ишлаб чиқариш оқова сувлари, ташқи канализацияга етиб келгунча зарарли моддалардан тозаланиши, тозаланган сувда зарарли моддалар таркиби санитар нормаларига асосан чегараланган концентрациясидан ошиб кетиши керак эмаслиги, ишлаб чиқариш эҳтиёжлари учун бериладиган сувнинг сифати технологик талабларга мос бўлиши, ичимлик сувдан фойдаланиш учун сув қувурига уланган фавворачалар бўлиши керак, иш жойидан сув ичиш қурилмасигача бўлган масофа 75 м дан ошмаслиги , ичимлик сувининг ҳарорати 8°С дан 20°С гача бўлиши керак бўлади.

Ёғоч қурилиш материаллари ишлаб чиқариш корхоналари майдонида, ишлаб чиқариш ва ёрдамчи бинолар ва хоналарда табиий ва сунъий ёритишлар ҚМҚ 2.01.05-98 “Табиий ва сунъий ёритиш” талабларига мувофиқ бўлиши,ёритиш ускуналарини ўрнатишда қандилларнинг турлари, лампаларнинг қуввати ва уларнинг жойлашиши тасдиқланган лойиҳага мос бўлиши,ишлаб чиқариш цехларидаги, хом ашё омборлари ва юк тушириш-ортиш майдонларидаги технологик ускуналар умумийга қўшимча равишда кўчма ёритиш мосламалари билан таъминланган бўлиши, авария ёритиш тармоқларига электр энергия истеъмолчиларини улаш тақиқланиб, авария ёритишларининг созлиги камида чоракда бир марта текширилиши лозим.

Юқори хавфли хоналарда кучланиши 36 В дан юқори бўлмаган кўчма электр ёритгичлар ишлатилиши керак. Ўта хавфли хоналарда, хоналардан ташқари ҳамда ускуналар ва иншоотлар (бункерлар, силосослар, қудуқлар, буғлантириш камералари, туннеллар ва бошқалар)ни ёритиш учун кўчма электр ёритгичларнинг кучланиши 12 В дан ошмаслиги керак. Барча кўчма ёритгичларнинг металл ҳимояланиш тўри ҳамда шиша қалпоғи бўлиши керак.

Ёғоч қурилиш материаллари ишлаб чиқариш корхоналарида ҚМҚ 2.09.12-98 “Ташкилотларнинг маъмурий ва маиший хоналар” қоидалари

талаблари ва мазкур Қоидаларга мувофиқ санитария-маиший ва қўшимча хоналар бўлиши лозим, маиший хоналар имкон қадар иш жойларига яқин жойлаштирилиши, махсус кийим-кечак ва баданнинг катта даражада ифлосланишини юзага келтирадиган муҳитдаги иш участкаларида ишловчи ходимлар учун махсус маиший хоналар жиҳозланиши, уй ва иш кийимлари сақланадиган гардероблар, ҳожатхоналар, ювиниш ва чўмилиш хоналари эркаклар ва аёллар учун алоҳида бўлиши лозим.

Кийим алмаштириш хоналари, душхоналарнинг ўлчамлари, душ сеткалари, оёқ ванналари, бет-қўл ювгичлари, истеъмол сув таъминоти қурилмалари, ҳожатхоналар ва бошқа шу каби қурилмаларнинг сони, кўпчиликни ташкил этадиган сменада ишловчиларнинг сони ҳисобга олинган ҳолда белгиланиши, душхоналар ва ҳожатхоналардаги тарновлар, каналлар, траплар, писсуарлар ва унитазлар мунтазам равишда тозаланиши, ювилиши ва дезинфекция қилиниши лозим.

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МУРАККАБ РК-ЎҒИТЛАРНИНГ ФИЗИК-МЕХАНИК ВА ТОВАР ХОССАЛАРИ

Аннотация. *Мақолада термоконцентрат ва минераллашган массани нитрат кислотада парчалаб, сўнг икки марта фильтрлаш орқали олинган фосфоконцентратга калий сульфат таъсир эттириб ўғитлар олиш баён этилган. Шу олинган ўғит наъмуналарининг донадорлиги, гигроскопик нуқтаси, мустахкамлиги, сочилувчанлиги, оқувчанлик кўрсаткичларини аниқлангандаги натижалари келтирилган.*

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PHYSICAL-MECHANICAL AND PRODUCT PROPERTIES OF COMPOUND RK-FERTILIZERS

Abstract. *The article describes the production of fertilizers by treating the phosphoconcentrate obtained by disintegrating the thermoconcentrate and mineralized mass in nitric acid and then filtering it twice with potassium sulfate.*

The results of determining the granularity, hygroscopic point, strength, dispersibility, and readability of the obtained fertilizer samples are presented.

Key words: *thermoconcentrate, mineralized mass, size of fractions, hygroscopic point, physico-mechanical property, granularity, dispersion, strength of grains.*

Кириш. Қишлоқ хўжалиги экинзорларида ўсимликларни тўлиқ ўсиб ривожланиши ҳамда уларни ҳосилдорлигини ошириш учун нафақат азот ёки фосфор озуқа моддалари балки калийни ўз ичига олган мураккаб ўғитлар ишлаб чиқариш ва илмий асосларини яратиш зарур ва долзарб. Шу сабабли, қуйидаги тадқиқотларда маҳаллий хом-ашёдан мураккаб фосфор-калийли ўғитлар олиш технологиясини ишлаб чиқиш ва уларнинг физик-механик хусусиятларини ўрганиш натижалари келтирилган.

Тадқиқот объекти ва усуллари. Фосфор-калийли ўғитлар олиш учун лаборатория тажрибаларида термоконцентрат ва минераллашган масса нитрат кислотада парчаланиб, фосфатнитраткислотали бўтқа таркибидаги кальций нитратни фильтралаш орқали фосфоконентрат олинди. Фильтрлашда фосфор оксидини йўқотилишини олдини олиш учун аммиак гази билан нейтралланди. Фосфат хомашёсини нитрат кислота билан парчалаб ва икки марта сув билан суюлтириб, сўнгра икки марта филтрлаш орқали олинган нам фосфоконцентратга қуритилмаган калий сульфат қўшилди. Ҳосил бўлган масса 105-115 ^{o}C ҳароратда қуритилди. Қуритилган тайёр мураккаб РК-ўғитларини кимёвий таҳлил қилинди. Олинган фосфоконцентратга маълум миқдорда калий сульфат (калий хлорид ва аммоний сульфат асосида олинган) таъсир эттириб, ҳосил бўлган маҳсулотни қуритиш орқали таркибида турли нисбатларда озуқа моддалари бўлган мураккаб РК-ўғитларини олиш жараёнлари ўрганилди.

Лаборатория тажрибалари асосида олинган мураккаб ўғитларни саноат миқёсида ишлаб чиқариш ҳамда омборларда сақлаш, ташиш ва уларни қишлоқ хўжалигида тупроққа солиш жараёнида ўсимликларга тенг тақсимланиши, ўғитни транспортировка ва сақлаш каби ишларни ташкил этишда маҳсулотларнинг физик-механик ва товар хоссалари қандай шароитни талаб этишини билиш муҳим хисобланади. Олинган мураккаб РК-ўғитлар донадорлик таркиби ўрганилди (1- ва 2-жадвалар).

Қаттиқ намуналардаги сувнинг миқдорини 100-105°C ҳароратда қуритиш шкафида доимий оғирликгача қуритиш орқали аниқланди [1].

Хом ашё, оралиқ маҳсулотларнинг физик-кимёвий хоссалари яъни, зичлик, қовушқоқлик, pH, донадорларнинг мустаҳкамлиги, сочилувчанлик, намлик сиғими, оқувчанлик, гигроскопик нуқтаси ва хоказолар ўрганилди.

Эритма ва бўтқаларнинг зичлиги пикнометр ПЖ-2 ёрдамида [2] уларнинг кинематик қовушқоклиги шишали капиллярли вискозиметрлар ВПЖ-1 ва ВПЖ-2 ёрдамида аниқланди [3]. Уларнинг pH кўрсатгичлари эса METTLER TOLEDO FE20/EL20 pH meter quick guide ускунасида аниқланди [4].

Ўғит доналарининг статик мустаҳкамлиги ИПГ-1 турдаги жиҳозда аниқланди [5]. Усул икки сирт орасидаги бир ўқли сиқишдаги синалаётган фракция донадор ўғитнинг бузилиши учун сарф бўлган кучни аниқлашга асосланган.

Сочилувчанлик [6] адабиётда берилган усул бўйича текис каттиқ сиртга 1м баландликдан бир мартали ташлаб юбориш ва сочилишдан кейин элакда қолган ўғит оғирлигини аниқлашга асосланган.

Доналар ўлчами 2-3мм бўлган ўғит намуналарнинг намлик сиғими ва гигроскоплиги 25°С да эксикаторли (Пестов) усулда аниқланди [7].

Ўғитларнинг оқувчанлигини аниқлаш учун турли хил усуллардан фойдаланилади. Ўғитларнинг оқувчанлиги тубининг ўлчами 15 мм, ички бурчаги 60º ли воронка (Меринг воронкаси)дан аниқ вақт давомида массаси 500 грамм бўлган ўғитнинг оқиб ўтиши учун сарфланган вақтни ўлчаш орқали аниқланади. Ўғитларнинг белгиланган оқувчанлик қийматларини оқиб ўтиши учун сарфланган вақтни ўлчаш орқали 10 балли шкалада 3 та синфга синфланади: агар ўғит воронка орқали 0-15 секунд вақтда ўтса 10 балл, 20-30 секунд вақт ичида ўтса 9-8 балл, вақтнинг 30 секунд қийматида 8-6 балл.

Тадқиқот натижалар ва уларнинг мухокамаси. Лаборатория натижалари термоконцентрат асосидаги фосфоконцентрат ва калий сульфат асосида олинган фосфор-калийли ўғитларда 1 мм ва ундан кичик ўлчамли фракциялар 1,59-1,01 % оралиғида бўлади. 6-5 мм ўлчамли фракциялар кислота меъёрига караб 6,58 %дан 11,11 %гачани ташкил этади. Ўғитлар таркибидаги калий сульфатнинг камайтирилиши билан 1 мм ва ундан кичик фракциялар миқдори ярим фоизгача камаяди, 5-3 мм ўлчамли фракциялар миқдори эса ортиб боради.

1-жадвал

Термоконцентратдан олинган фосфоконцентрат ва калий сульфат асосида олинган мураккаб РК-ўғитлар донадорлик таркиби, %

P_2O_5 :K_2O	Фракциялар ўлчами, мм				
	-6 ÷ +5	-5 ÷ +3	-3 ÷ +2	-2 ÷ +1	-1 ≥
кислота стехиометрик меъёри 70% бўлганда					
0,5:1	9,20	53,99	32,10	3,12	1,59
0,7:1	9,66	52,73	32,32	3,57	1,72
1:1	9,93	53,58	32,64	2,49	1,36
1:0,7	10,52	54,21	32,9	1,36	1,01
1:0,5	11,11	54,56	33,01	0,23	1,09
кислота стехиометрик меъёри 70% бўлганда					
0,5:1	7,31	54,04	34,09	2,99	1,57
0,7:1	7,57	54,36	34,68	1,91	1,48
1:1	7,85	54,74	34,81	1,18	1,42
1:0,7	7,50	54,83	35,36	1,08	1,23
1:0,5	7,53	54,90	35,45	1,02	1,10
кислота стехиометрик меъёри 80% бўлганда					
0,5:1	6,65	54,09	35,22	2,48	1,56
0,7:1	6,87	54,89	35,37	1,42	1,45
1:1	7,10	55,01	35,50	1,02	1,37
1:0,7	7,04	55,01	35,61	1,09	1,25
1:0,5	7,08	55,12	35,66	1,07	1,11
кислота стехиометрик меъёри 90% бўлганда					
0,5:1	6,58	54,84	35,17	2,08	1,33
0,7:1	6,84	55,02	35,53	1,48	1,13
1:1	6,95	55,3	35,61	1,09	1,05
1:0,7	6,98	55,22	35,75	1,04	1,01
1:0,5	7,00	55,26	35,81	1,00	1,01

Шунингдек, мураккаб азот-фосфорли ўғитларда 5-3 мм ўлчамли фракциялар кислота меъёрига қараб 53,99-55,26% ни ташкил этади, 3-2 мм ўлчамли фракциялар кислота меъёрига қараб 32,10% дан 35,81 % гачани ташкил этади, 5-6 мм ўлчамли фракциялар эса 6,58-11,11% ни ташкил этади.

2-жадвал

Минераллашган массадан олинган фосфоконцентрат ва калий сульфат асосида олинган мураккаб РК-ўғитлар донадорлик таркиби, %

$N:P_2O_5$:K_2O	Фракциялар ўлчами, мм				
	-6 ÷ +5	-5 ÷ +3	-3 ÷ +2	-2 ÷ +1	-1 ≥
кислота стехиометрик меъёри 60% бўлганда					
1:2:1	9,16	54,02	32,09	3,1	1,63
1:1:2	9,62	52,76	32,31	3,55	1,76
1:1:1	9,89	53,61	32,63	2,47	1,4
1:0,7:0,5	10,48	54,24	32,89	1,34	1,05
2:1:1	11,07	54,59	33	0,21	1,13
кислота стехиометрик меъёри 70% бўлганда					
1:2:1	7,27	54,07	34,08	2,97	1,61
1:1:2	7,53	54,39	34,67	1,89	1,52
1:1:1	7,81	54,77	34,8	1,16	1,46
1:0,7:0,5	7,46	54,86	35,35	1,06	1,27
2:1:1	7,49	54,93	35,44	1	1,14
кислота стехиометрик меъёри 80% бўлганда					
1:2:1	6,61	54,12	35,21	2,46	1,6
1:1:2	6,83	54,92	35,36	1,4	1,49
1:1:1	7,06	55,04	35,49	1	1,41
1:0,7:0,5	7	55,04	35,6	1,07	1,29
2:1:1	7,04	55,15	35,65	1,05	1,15
кислота стехиометрик меъёри 90% бўлганда					
1:2:1	6,54	54,87	35,16	2,06	1,37
1:1:2	6,8	55,05	35,52	1,46	1,17
1:1:1	6,91	55,33	35,6	1,07	1,09
1:0,7:0,5	6,94	55,25	35,74	1,02	1,05
2:1:1	6,96	55,29	35,8	0,98	1,05

Юқорида келтириб ўтилган қонуниятлар минераллашган массадан олинган фосфоконцентрат ва калий сульфат асосидаги ўғитларда ҳам такрорланиши тажриба натижалари келтирилган 2-жадвалда акс этди. Натижалар кўрсатдики, ҳар икки фосфат хомашёсидан олинган мураккаб фосфор-калийли ўғитлар доналарининг ўлчамлари қишлоқ хўжалиги талабларига тўлиқ жавоб беради.

Минерал ўғитларни қишлоқ хўжалигида қўллашда қандай қишлоқ хўжалиги агрегатларидан фойдаланиш кераклиги унинг физик-механик хоссаларидан келиб чиқади. Лаборатория тажрибалари орқали мураккаб РК-ўғитларнинг ўртача физик-механик ва товар хоссалари ўрганилди (3-жадвал).

Термоконцентратдан олинган фосфоконцентрат ва калий сульфат асосидаги ўғитлар сочилувчанлиги 100% га, кислота меъёри 60% ни ташкил этганда гигроскопик нуқтаси мос равишда 62 %дан 69% гача, донадорлиги эса 88,56 дан 92,02 %гача бўлиши аниқланди. Кислота меъёри камайганда ўғитларнинг оқувчанлиги, қиялик бурчаги ва гигроскопик нуктаси яхшиланиб бориши аниқланди.

3-жадвал

Фосфор-калийли мураккаб ўғитларнинг физик-механик хоссалари

Кислота меъёри, %	Нам-лиги, %	Хажмий оғирлиги, г/см^3	Мустах-камлиги, мПа	Сочилув-чанлиги, %	Қиялик бурчаги, ^{o}	Оқув-чанлиги, сек	Гигрос-копик нуқтаси, %	Дона-дорлиги, %
термоконцентратдан олинган фосфоконцентрат ва калий сульфат асосида								
60	1,53	1,24	3,56	100	32	7,6	69	88,56
70	1,61	1,27	3,51	100	31	7,7	67	91,09
80	1,75	1,35	3,48	100	31	8,1	65	91,71
90	1,90	1,41	3,40	100	30	8,3	62	92,02
минераллашган массадан олинган фосфоконцентрат ва калий сульфат асосида								
60	1,59	1,23	3,68	100	33	7,5	68	88,59
70	1,71	1,25	3,60	100	32	7,8	67	91,08
80	1,88	1,31	3,55	100	32	8,2	64	91,78
90	1,91	1,36	3,33	100	31	8,3	63	92,06

Масалан, термоконцентратдан олинган фосфоконцентрат ва калий сульфат асосида олинган ўғитларда кислота меъёри камайганда ўғитларнинг гигроскопиклиги 69 %гача ортиб бориши билан бирга унинг қиялик бурчаги 30 дан 32^o гача ортади шунингдек, бу ўғитларнинг оқувчанлиги 8,3 дан 7,6 сонияга камаяди. Бундай хассаларни намоён этишига сабаб фосфор-калийли ўғитларнинг таркибидаги намликдир. Бу қонуниятлар минераллашган массадан олинган фосфоконцентрат ва калий сульфат асосида олинган ўғитларда ҳам такрорланади.

Хулоса. Олинган натижалар кўрсатдики, фосфат хомашёси (термоконцентрат ва минераллашган), нитрат кислота ҳамда калий сульфат асосида олинган фосфор-калийли мураккаб ўғитлар доналарининг ўлчамлари билан қишлоқ хўжалиги талабларига тўлиқ жавоб беради. Айниқса уларни сақлашда гигроскопик (намликни ютиб олиш қўрсаткичи) нуқтасининг юқорилиги уларни нам тортиб қолишидан сақлайди. Доналар мустахкамлиги уларни ишлатишда ноқулайликлар келтириб чиқармайди ҳамда бошқа мураккаб ўғитлар физик-механик ва товар хоссаларидан кам бўлмаган ўғитлар олиш мумкинлигини кўрсатади.

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ИССЛЕДОВАНИЕ СОСТАВА И СТРУКТУРНЫХ ОСОБЕННОСТЕЙ НАВБАХОРСКОГО БЕНТОНИТА ДЛЯ СОЗДАНИЯ АДСОРБЕНТОВ

Аннотация. *Предметом исследования являются методы модифицирования щелочного и щелочно-земельного бентонита с растворами Ca+Zn+Mn и Fe+Mg+Mn, установление их текстурных и адсорбционных активностей по отношению неорганическим ионам (Cu^{2+}, PO_4^{3-}), нефтепродуктам из водных растворов, а также молекул воды и бензола из газовой среды. исследование состава, структуры исходных бентонитовых глин щелочной и щелочноземельной природы, установление их текстурных характеристик и адсорбционной активности по отношению к органическим и неорганическим адсорбатам. Исследование влияния процессов обогащения щелочного и щелочноземельного бентонита и модифицирования смесями пленкообразующющих ионов (Ca+Zn+Mn и Fe+Mg+Mn) на структуру и состав полученных бентонитов.Установление влияния обогащения и модифицирования на текстурные характеристики бентонитов. Изучение кинетики адсорбции тяжелых металлов и фосфат иона, установление характеристик пористой структуры на основе данных адсорбции паров воды и бензола. Установлено, что изменение минералогического состава при обогащении влияет на дисперсность изучаемых образцов и повышает фракции размерами менее 1 мкм в 1,93 и 2,8 раза, соответственно для образцов Б1 и Б2.установлены оптимальные условия для модификации бентонитов Б1 и Б2 с растворами солей (Fe^{3+}, Ca^{2+}), что способствует повышению удельной поверхности данных образцов от 56,3 и 42,7 до 146,1 и 115,2 $м^2/г$;*

Они содержат SiO_2 и Al_2O_3 как основные компоненты, что типично для бентонитовых глин. Оба образца содержат Fe_2O_3, FeO, P_2O_5, SO_3 и CO_2 в сравнимых количествах. Анализ гранулометрического состава был выполнен методом непрерывного взвешивания осадка.

Ключевые слова: *бентонит, щелочноземельный, модификации глин, гранулометр состава, слоистых силикат, Навбахорское метсорожение.*

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STUDY OF THE COMPOSITION AND STRUCTURAL FEATURES OF NAVBAKHOR BENTONITE FOR THE CREATION OF ADSORBENTS

Abstract. *Abstract. The subject of the study is the methods of modifying alkaline and alkaline-earth bentonite with Ca+Zn+Mn and Fe+Mg+Mn solutions, establishing their textural and adsorption activities in relation to inorganic ions (Cu2+, PO43-), oil products from aqueous solutions, as well as water and benzene molecules from a gaseous medium. Study of the composition and structure of the original bentonite clays of alkaline and alkaline-earth nature, establishing their textural characteristics and adsorption activity in relation to organic and inorganic adsorbates. Study of the effect of enrichment processes of alkaline and alkaline-earth bentonite and modification with mixtures of film-forming ions (Ca+Zn+Mn and Fe+Mg+Mn) on the structure and composition of the obtained bentonites. Establishing the effect of enrichment and modification on the textural characteristics of bentonites. Study of the kinetics of heavy metal and phosphate ion adsorption, establishment of the characteristics of the porous structure based on the adsorption data of water vapor and benzene. It was found that the change in the mineralogical composition during enrichment affects the dispersion of the studied*

samples and increases the fractions with sizes less than 1 μm by 1.93 and 2.8 times, respectively, for samples B1 and B2. Optimal conditions for modification of bentonites B1 and B2 with salt solutions (Fe^{3+}, Ca^{2+}) were established, which contributes to an increase in the specific surface area of these samples from 56.3 and 42.7 to 146.1 and 115.2 m2/g; They contain SiO2 and Al2O3 as the main components, which is typical for bentonite clays. Both samples contain Fe2O3, FeO, P2O5, SO3 and CO2 in comparable quantities. The analysis of the granulometric composition was performed by continuous sediment weighing.

Keywords: *bentonite, alkaline earth, clay modifications, granulometric composition, layered silicate, Navbakhor metropolitan area.*

Введение. С каждым годом в мире наблюдается увеличение негативного воздействия человека на различные элементы окружающей природной среды. Это проявляется в загрязнении воздуха и почвы, увеличении выбросов различных вредных веществ в природные водные объекты через сточные воды, что влечет за собой возрастающие проблемы для здоровья населения [1,2]. Факторы окружающей среды играют важную роль в формировании здоровья человека среди множества других факторов [3].

Особое значение имеет вопрос качества питьевой, природной, технической и сточной воды. В настоящее время, когда пресная вода становится дефицитом, более чем 1,1 миллиарда человек уже сталкиваются с этой проблемой. По прогнозам ученых, к 2025 году их число в мире возрастет до более чем 3 миллиардов [4]. Качество воды оказывает значительное влияние на здоровье человека. В результате промышленной деятельности человека водоемы стали загрязняться различными вредными веществами, такими как металлы в ионной форме, нефтепродукты, токсичные синтетические вещества и другие загрязнители [5].

В последние годы особое внимание уделяется проблеме загрязнения гидросферы так называемыми «тяжелыми металлами». Главными источниками этих металлов являются естественные горные образования (магматические и осадочные породы) и их компоненты. Также техногенными источниками тяжелых металлов являются промышленные секторы, такие как горнодобыча, черная и цветная металлургия, цементное производство, машиностроение, металлообработка, производство приборов и другие отрасли [6-8]. В настоящее время различные предприятия, занимающиеся гальваническими покрытиями и химической обработкой металлов, высыпают тысячи тонн высокотоксичных тяжелых металлов, таких как хром, никель, свинец, медь, кадмий, цинк, олово и другие, в окружающую среду.

С целью выявления потенциальных сорбентов были исследованы монтмориллонитовые глины Навбахорского метсорождения (Навоийская область). Данное месторождение было выбрано среди других месторождений Узбекистана на основании того, что глины этого месторождения имеют более высокое содержание монтмориллонита [7], и общие запасы. На данном месторождении имеется ранее действующий карьер по добыче глин. Отбор

проб производился только после производства работ по расчистке откосов и уступов карьера. На расчищенной поверхности бороздой с сечением 10х10 см отбирались послойно пробы. Глины опробовались послойно. Интервал проб не превышал 3-4 м. В карьере встречается ка щелочные (Б1) и щелочно-земельные (Б2) бентониты. Образцы глин Б1 зеленовато-серые, жирные на ощупь и плотные при высыхании, Б2 светло-зеленого цвета, визуально представляют собой крепкую осадочную породу с небольшими неравномерными включениями полевого шпата.

Экспериментальная часть. Для установления структуры и состава данных образцов бентонита были проведены анализы, как рентгенофазовый, электронно-микроскопический, термический, спектральный.

Рентгеновские дифрактограммы получены на рентгеновском дифрактометре XRD Empyrean PANanalytical с возможностью минимального шага сканирования 0,0001° и воспроизводимостью установки угла<0,0002°. Современный дифрактометр позволяет проводить съемку и обработку данных при помощи персонального компьютера с использованием пакетов программ PDWin и PELDos, предназначенных для автоматизации процесса съемки, обработки дифрактограмм и решения различных кристаллографических задач для поли кристаллических материалов.

Химический состав природных глин, определенный методом классической аналитической химии представлен следующими оксидами (табл. 1).

Таблица 1.
Химический состав природных образцов бентонитовых глин, % масс.

Оксиды	Содержание, % на сухое вещество	
	Б1	Б2
SiO_2	57,8	61,2
Al_2O_3	15,1	15,9
Fe_2O_3	2,6	2,3
FeO	2,3	3,1
CaO	0,8	3,2
MgO	1,3	3,1
Na_2O	3,1	1,1
K_2O	1,5	0,6
P_2O_5	0,2	0,3
SO_3	0,4	0,3
CO_2	0,4	0,3
п.п.п.	14,5	8,5

Содержание SiO_2 выше в Б2 (61,2%) по сравнению с Б1 (57,8%). Б2 содержит значительно больше CaO (3,2%), чем Б1 (0,8%). Это указывает на наличие более высокого содержания кальция в щелочно-земельном бентоните.

Как и CaO, содержание MgO также выше в Б2 (3,1%) по сравнению с Б1 (1,3%). Б1 имеет больший процент Na_2O (3,1%) по сравнению с Б2 (1,1%). Это указывает на наличие более высокого содержания натрия в щелочном бентоните. Содержание K_2O ниже в Б2 (0,6%) по сравнению с Б1 (1,5%).

Показатель п.п.п. начительно выше в Б1 (14,5%) по сравнению с Б2 (8,5%).

Таким образом, при выборе между этими двумя образцами для конкретного применения необходимо учитывать их химический состав, особенно содержание кальция, магния и натрия, которые могут существенно влиять на свойства бентонита.

Минералогический состав изучаемых образцов определен на основании рентгеновского фазового анализа (РФА) (рис. 1).

Этот рефлекс указывает на то, что образец Б1 представляет собой типичный щелочной бентонит с хорошей степенью кристалличности и слоистой структурой. Щелочные бентониты, особенно те, которые содержат натрий в качестве обменного катиона, как указано данными для образца Б1, обычно обладают высокой пластичностью и водопоглощающей способностью.

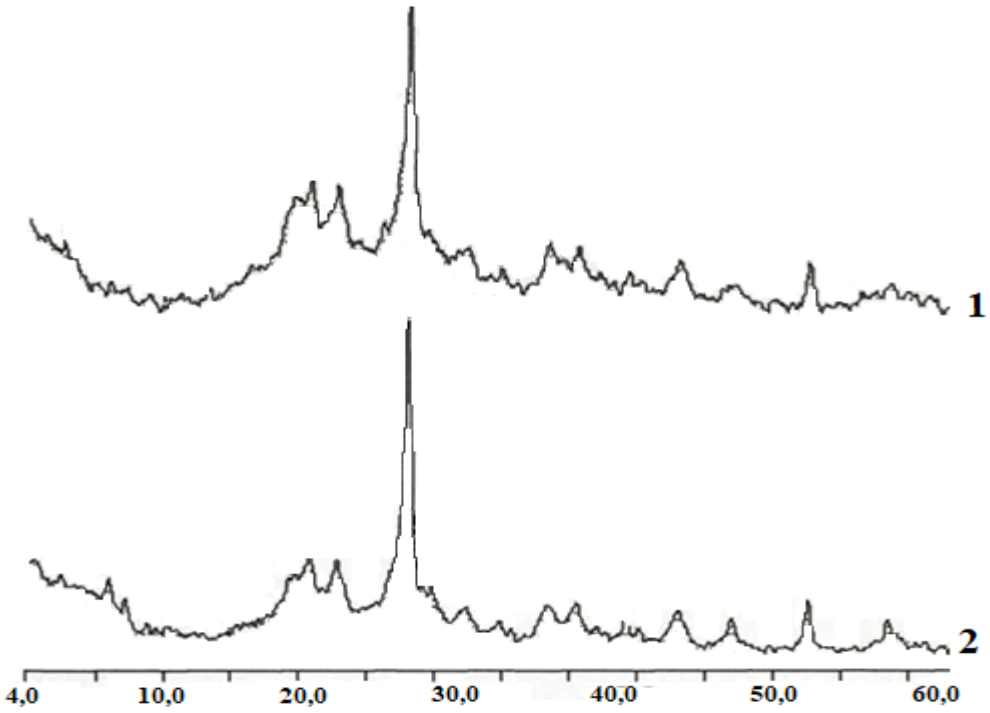
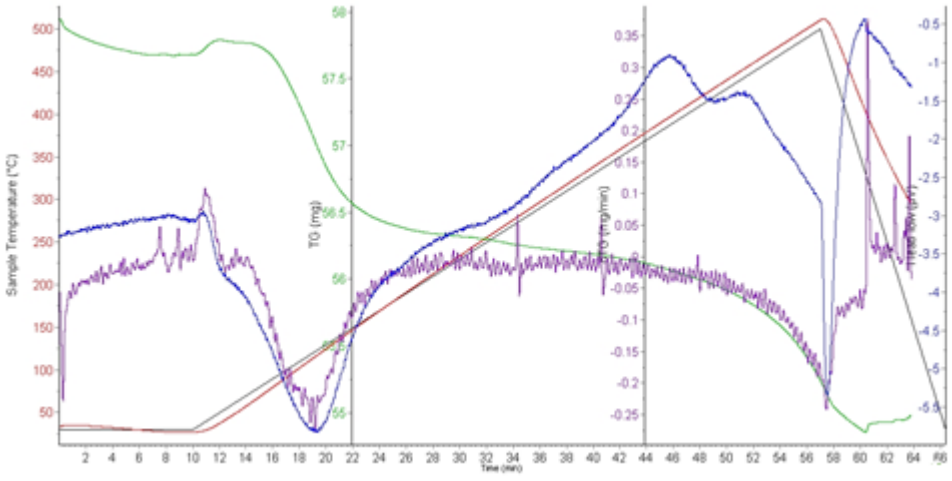


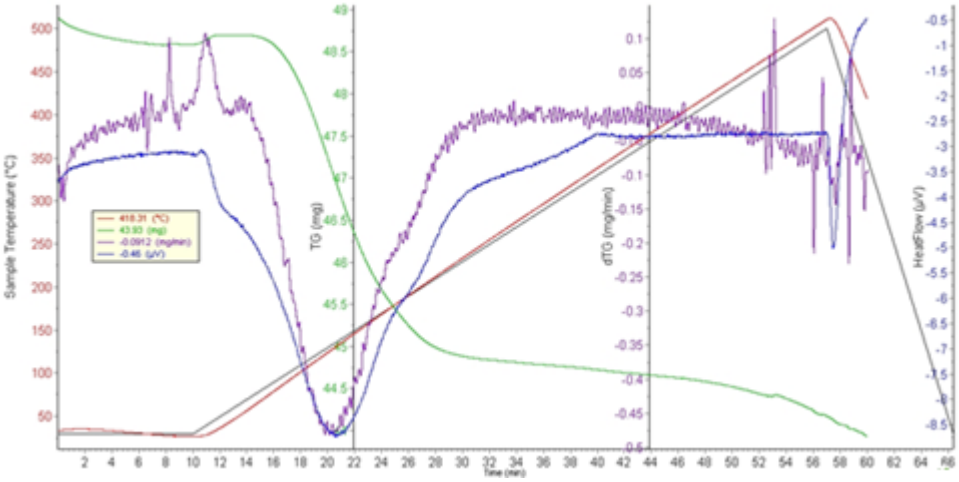
Рис. 1 Дифракторграммы образцов бентонита: 1) Б1; 2) Б2.

Рефлекс d001=1,47 показывает, что монтмориллонит в образце Б2 представлен преимущественно кальциевой и магниевой формой. Наличие рефлекса d_{020} = 0.446 нм характеризует диоктаэдрическую структуру монтмориллонита, что подтверждает его слоистую геометрию с двумя октаэдрическими слоями алюминия или магния, разделяемыми тетраэдрическим слоем кремния.

Данные термического анализа полностью соответствуют результатам РФА. Термограммы Б1 и Б2 отличаются расположениями и глубиной эндотермических эффектов (рис. 2).



1)



2)

Рис. 2 Результаты термического анализа глин: 1) Б1; 2) Б2.

Полученная дериватограмма состоит из 4 кривых. Анализ кривой динамического термогравиметрического анализа (DTGA) (кривая 2) показывает, что на кривой в основном содержатся 2 различные пики разложения, что соответствует температуре 63-148ºС и 159-477ºС. Первый интенсивный эндотермический эффект у НЩБ обнаруживается при температурах 55-157°С и их интенсивность значительно больше по сравнению с интенсивностью КР, что связано гидрофильностью глин за счет различного преобладания того или иного обменного катиона в составе монтмориллонитовых минералов. Изменение массы в диапазоне температур 166-457°С наоборот заметно меньше.

Также образцы различаются по значениям скорости разложения (мг/мин) и по количеству расхода энергии (μV*s/mg) для разрыва химических связей в составе бентонитов, что показано в табл. 2.

Таблица 2
Показатели термического анализа

№	Температура, ºС	Уменьшение массы, г		Скорость разложения вещества, мг/мин		Количество энергии (μV*s/mg))	
		Б1	Б2	Б1	Б2	Б1	Б2
1	50	0,221	0,561	0,135	0,132	1,51	1,51
2	100	0,839	1,991	0,561	0,451	2,63	2,91
3	200	1,091	2,031	0,661	0,458	2,19	1,98
4	300	1,151	3,240	0,401	0,268	3,18	2,97
5	400	2,591	4,190	0,818	0,225	1,96	1,15
6	500	3,091	4,571	0,512	0,501	2,99	2,23

Как можно увидеть из данных табл. 2 на каждом этапе повышения температуры у обоих образцов наблюдается уменьшение массы, что указывает на наличие процессов дегидратации, окисления или разложения вещества.

Образец Б2 в большей степени теряет массу на всех этапах термического анализа по сравнению с Б1. Это может говорить о том, что в составе Б2 присутствует больше воды или других легкоиспаряющихся компонентов.

Скорость разложения вещества на начальных этапах (50 и 100ºС) скорость разложения у Б1 выше, чем у Б2. При 200ºС скорость разложения у обоих образцов почти одинакова. На последующих этапах (более 300ºС) скорость разложения у Б1 систематически уменьшается, в то время как у Б2 она сначала снижается, затем повышается.

Результаты экспериментов и их обсуждение. Определение гранулометрического состава проводили несколькими методами. Сначала использовали метод отмучивания с полным выделением фракций. Метод основан на принципе различной скорости свободного осаждении частиц твердого тела под воздействием силы тяжести в жидкости. В данной работе были выделены и собраны глинистые фракции с размерами частиц менее 100 мкм, 1 мкм. Содержание каждой фракции в 100 г глины определено в % по массе. Результаты гранулометрического состава представлены в табл. 3.

Таблица 3.
Гранулометрический состав глин*, %

Образец	≥100	100≥50	50≥10	10≥5	5≥1	1≥
Б1	31,2	28,8	10,4	1,2	20,2	8,2
Б2	39,3	29,1	8,6	0,7	19,2	3,1

*-размеры приведены в мкм.

На основе представленной таблицы 2.3, отображающей гранулометрический состав глин, можно сделать следующие выводы: в образце Б1 содержание крупных частиц составляет 31,2%, в то время как для Б2 таких частиц больше и составляет 39,3%. Следовательно, Б2 более крупнозернистый по сравнению с Б1.

Образцы Б1 и Б2 имеют схожий гранулометрический состав в этом диапазоне – 28,8% и 29,1% соответственно. Б1 содержит 8,2% частиц размера 1≥, что значительно больше, чем в образце Б2, где таких частиц всего 3,1%. Это указывает на то, что Б1 имеет более высокую долю ультратонких частиц по сравнению с Б2.

При характеристике катионообменого комплекса определяли содержание обменных катионов и показатели кислотно-основных свойств материалов. К ним относятся – гидролитическая кислотность, обменная кислотность и активная кислотность. Для процесса катионного обмена наиболее значима обменная кислотность, так как протоны водорода этого типа кислотности вступают в реакции обмена в первую очередь и таким образом являются первыми конкурентами для обменных катионов.

Состав и состояние катионообменного комплекса, глинистых образцов определяли по методике, изложенной в [8]. Результаты определения обменных катионов приведены в табл. 4.

Таблица 4.

Состав и состояние катионообменного комплекса природных глин

Образец	Na^+	K^+	Ca^{2+}	Mg^{2+}	$\Sigma_{катион}$	pH водной вытяжки	pH солевой вытяжки	$H_{обм}$, ммольэкв/100г
	мгэкв/100 г							
Б1	46,3	8,6	11,2	14,5	80,6	7,8	6,7	0,169
Б2	12,2	9,7	28,1	15,6	65,5	7,6	6,3	0,108

В глине Б1 доминирующим катионом является Na^+ (46,3 мгэкв/100 г), в то время как в глине Б2 – это Ca^{2+} (28,1 мгэкв/100 г). Это указывает на различное минералогическое происхождение или различия в условиях формирования этих глин. Например, глина с высоким содержанием Na+ может указывать на более высокую концентрацию монтмориллонита или других смектитовых минералов, которые часто ассоциируются с натриевыми средами. Глина Б1 имеет больший катионообменный комплекс (80,6 мгэкв/100 г) по сравнению с глиной Б2 (65,5 мгэкв/100 г). Это может свидетельствовать о том, что в глине Б1 присутствует больше слоистых минералов с катионообменными свойствами.

Заключение. Минералогическое исследование подтвердило доминирование монтмориллонита в образцах Б1 и Б2, свидетельствуя о высоком содержании этого активного сорбента в глинах. Электронно-микроскопическая характеристика указывает на разнообразие форм монтмориллонитовых агрегатов, что отражает разницу в микроструктуре минералов между образцами. Химический состав глин разнообразен, особенно по содержанию элементов O, Si, Al, Na и Ca, что подтверждает различия в их минералогических свойствах. Б2 преимущественно содержит крупные и средние частицы, в то время как глина Б1 богата мелкодисперсными частицами. Анализ глин Б1 и Б2 выявил существенные различия в их катионном составе и свойствах. Глина Б1 обладает доминирующим содержанием катиона Na^+ и выше катионообменным комплексом по сравнению с глиной Б2, где доминирует Ca^{2+}. Эти различия свидетельствуют о разной минералогической природе и условиях формирования данных глин. Высокая катионообменная способность глины Б1 указывает на преобладание в ее составе слоистых минералов, таких как смектиты. Анализ текстурных характеристик образцов глин Б1 и Б2 показал их существенные различия. Удельная поверхность образца Б1 значительно превосходит аналогичный показатель у образца Б2, что указывает на более высокий адсорбционный потенциал этого образца. В то же время, объем и средний размер микропор у образца Б2 больше, что может отражать его

способность к более интенсивному взаимодействию с веществами в каталитических процессах. Кинетические исследования процесса адсорбции показали, что начальная скорость сорбции катионов металлов максимальна, особенно выделяется первая активная стадия адсорбции. Образец Б1 демонстрирует более высокую активность адсорбции в начальный период времени, что может быть связано с электростатическими взаимодействиями и большей плотностью активных мест на поверхности. В дальнейшем, происходит замедление процесса адсорбции из-за уменьшения активности пограничного слоя и миграции катионов к активным местам внутри сорбента. Отмечено различие в сорбции ионов меди и свинца на глинах Б1 и Б2. Изотермы адсорбции для Б1 характеризуются ступенчатым профилем, в то время как для Б2 наблюдается более равномерное нарастание. Это может быть связано с химической и минералогической природой образцов и разницей в их пористой структуре.

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СОВРЕМЕННЫЕ ИННОВАЦИОННЫЕ МЕТОДЫ ИССЛЕДОВАНИЯ В ГИДРОБИОЛОГИИ

Аннотация: *Статья посвящена обзору современных инновационных методов исследования в гидробиологии, направленных на изучение водных экосистем и их реакции на антропогенные и климатические изменения. Рассматриваются ключевые подходы, включая анализ экологической ДНК (eDNA), метагеномику, дистанционное зондирование, автоматизированный мониторинг с использованием датчиков и автономных подводных аппаратов, а также применение искусственного интеллекта для анализа больших данных.*

Ключевые слова: *экосистема, биоразнообразия, климат, метод, инновация.*

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MODERN INNOVATIVE RESEARCH METHODS IN HYDROBIOLOGY

Abstract: *The article is devoted to an overview of modern innovative research methods in hydrobiology aimed at studying aquatic ecosystems and their response to anthropogenic and climate change. Key approaches are considered, including environmental DNA (eDNA) analysis, metagenomics, remote sensing, automated monitoring using sensors and autonomous underwater vehicles, as well as the use of artificial intelligence for big data analysis.*

Key words*: ecosystem, biodiversity, climate, method, innovation.*

Введение

Гидробиология, как наука, изучающая жизнь в водных экосистемах, играет ключевую роль в понимании экологических процессов, поддержании

биоразнообразия и решении проблем, связанных с изменением климата и антропогенным воздействием. В последние десятилетия развитие технологий привело к появлению инновационных методов, которые значительно расширили возможности исследований в этой области. Современные подходы, такие как молекулярные технологии, дистанционное зондирование и искусственный интеллект, позволяют более точно анализировать состояние водных экосистем, прогнозировать изменения и разрабатывать стратегии их сохранения. Цель данной статьи — рассмотреть ключевые инновационные методы в гидробиологии, их применение и перспективы развития.

Материалы и методы

Для анализа современных инновационных методов в гидробиологии были изучены научные публикации за последние 10 лет, доступные в базах данных Web of Science, Scopus и eLibrary. Основное внимание уделялось следующим направлениям: молекулярная экология (ДНК-метабаркодирование, eDNA), дистанционное зондирование (спутниковые и дроновые технологии), автоматизированные системы мониторинга и методы анализа данных с использованием искусственного интеллекта (ИИ). Также были рассмотрены примеры применения этих методов в исследованиях пресноводных и морских экосистем.

Результаты и обсуждения

Одним из наиболее значимых достижений в гидробиологии стало использование анализа экологической ДНК (eDNA). Этот метод позволяет определять присутствие видов в водной среде по следам их генетического материала (например, чешуи, слизи, экскрементов), без необходимости их прямого наблюдения. eDNA активно применяется для мониторинга редких и инвазивных видов, а также для оценки биоразнообразия. Например, исследования в Великих озерах США показали, что eDNA позволяет обнаружить инвазивных рыб, таких как азиатский карп, с точностью до 95% даже при низкой плотности популяции.

Метабаркодирование, использующее высокопроизводительное секвенирование (NGS), дает возможность анализировать целые сообщества микроорганизмов, фитопланктона и зоопланктона. Этот метод помогает выявлять изменения в структуре сообществ под воздействием загрязнения или изменения климата.

Спутниковые технологии и беспилотные летательные аппараты (дроны) стали важным инструментом для мониторинга водных экосистем. Спутники, такие как Sentinel-2 и Landsat, предоставляют данные о температуре вод, концентрации хлорофилла, мутности и других параметрах. Эти данные используются для оценки цветения водорослей, эвтрофикации и изменения качества воды. Например, в Балтийском море спутниковый мониторинг позволил выявить зоны гипоксии и разработать меры по их устранению.

Дроны, оснащенные мультиспектральными камерами, обеспечивают высокое пространственное разрешение и применяются для изучения прибрежных зон и мелководных экосистем. Их использование в Австралии

для мониторинга коралловых рифов показало высокую эффективность в выявлении теплового стресса кораллов.

Автоматизированные станции мониторинга, оснащенные датчиками для измерения pH, температуры, растворенного кислорода и других параметров, позволяют проводить непрерывный сбор данных в реальном времени. Такие системы, как Argo floats в океанологии, собирают информацию о физических и химических характеристиках морской воды на глубинах до 2000 м. В пресноводных системах подобные технологии используются для отслеживания сезонных изменений и антропогенного воздействия.

ИИ и машинное обучение (ML) находят широкое применение в обработке больших массивов данных, получаемых из различных источников. Например, алгоритмы ML используются для прогнозирования цветения токсичных водорослей на основе данных о температуре, питательных веществах и погодных условиях. В исследованиях Каспийского моря модели ИИ позволили предсказать изменения в популяциях планктона с точностью до 90%. Кроме того, ИИ применяется для анализа изображений, полученных с дронов и спутников, для автоматического распознавания объектов, таких как скопления водорослей или мусора.

Применение инновационных методов в гидробиологии значительно расширяет возможности исследований, позволяя проводить более точный и масштабный мониторинг водных экосистем. eDNA и метабаркодирование открывают новые горизонты для изучения биоразнообразия, особенно в труднодоступных районах. Дистанционное зондирование и автоматизированные системы обеспечивают непрерывный поток данных, что особенно важно для оперативного реагирования на экологические угрозы, такие как разливы нефти или цветение водорослей. ИИ, в свою очередь, ускоряет обработку данных и повышает точность прогнозов.

Однако существуют и ограничения. Например, eDNA требует высокой точности в сборе проб, чтобы избежать ложных результатов, а спутниковые данные могут быть ограничены облачностью или низким разрешением. Кроме того, внедрение этих технологий требует значительных финансовых вложений и квалифицированных специалистов, что может быть проблемой для развивающихся стран.

Заключение

Современные инновационные методы, такие как eDNA, дистанционное зондирование, автоматизированные системы мониторинга и ИИ, революционизируют гидробиологию, предоставляя новые инструменты для изучения и сохранения водных экосистем. Их дальнейшее развитие и интеграция позволят не только глубже понять процессы, происходящие в водоемах, но и эффективнее решать экологические проблемы. Перспективы включают расширение доступности этих технологий, разработку более точных моделей и интеграцию данных из различных источников для создания глобальных систем мониторинга.

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РАЗВИТИЕ КРЕАТИВНОСТИ У ПЕДАГОГА- ПСИХОЛОГА

Аннотация: *В статье рассматриваются теоретические основы и эффективные практики развития творческого мышления у будущих педагогов-психологов, модель интеллекта Гилфорда и концепция творческого мышления.*

Ключевые слова: *педагог, психолог, творческое мышление, интеллект, обучение.*

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DEVELOPMENT OF CREATIVITY IN A TEACHER-PSYCHOLOGIST

Annotation: *The article discusses the theoretical foundations and effective practices for developing creative thinking in future educational psychologists, Guilford's model of intelligence and the concept of creative thinking.*

Key words: *teacher, psychologist, creative thinking, intelligence, learning.*

Современное общество предъявляет особые требования к профессиональному облику педагога-психолога и особое внимание уделяется его компетентности, а также качествам личности. Одной из актуальных компетенций XXI века, определяющих готовность педагога к реализации образовательного процесса нестандартно с привнесением инновационных технологий, обеспечивающих реализацию деятельностного подхода в образовании - это креативность. Анализ ключевых теоретико-методологических подходов к развитию креативности у педагогов (аксиологического, психолого-педагогического, социального, интеграционного) выявили научно-педагогические, социально-педагогические, научно-методические предпосылки ее развития,

определяющие основные векторы креативности личности педагога-психолога с точки зрения мотивации к профессиональной деятельности и способности к разработке новых направлений в реализации образовательных задач. Происходящие в современном обществе преобразования вызывают необходимость подготовки будущего педагога-психолога, обладающего следующими компетенциями:

• способность осуществлять поиск, критический анализ и синтез информации, применять системный подход для решения поставленных задач;

• способность использовать психолого-педагогические технологии в профессиональной деятельности, необходимые для индивидуализации обучения, развития, воспитания, в том числе обучающихся с особыми образовательными потребностями;

• способность взаимодействовать с участниками образовательных отношений в рамках реализации образовательных программ;

• soft skills, отражающий гибкие над профессиональные компетенции 4 К -- креативность, критическое мышление, кооперация, коммуникация.

Профессия педагога-психолога предполагает не только работу с учащимися и студентами, но и значительную роль в развитии их креативных способностей. В связи с этим формирование творческого мышления у будущих педагогов-психологов является одной из актуальных задач науки и системы образования.

В настоящее время развитие творческого мышления считается одним из приоритетных направлений образования во всем мире. Международные организации, такие как UNESCO, OECD и Всемирный экономический форум, подчеркивают важность креативного мышления при модернизации образовательных систем. Например, в 2022 году в программе PISA (Programme for International Student Assessment), разработанной OECD, была введена отдельная система оценки творческого мышления, что подтверждает значимость данного подхода в образовательном процессе [1]. Кроме того, в своих исследованиях ученые, такие как Эдвард де Боно, Джой Пол Гилфорд и Эллис Пол Торренс, отмечали, что развитие творческого мышления является важным фактором интеллектуального прогресса человека.

В контексте Узбекистана этот вопрос также актуален. В рамках реформирования национальной системы образования особое внимание уделяется внедрению инновационных подходов. В «Стратегии развития системы образования Республики Узбекистан до 2030 года» подготовка специалистов с креативным мышлением выделена в качестве одной из приоритетных задач [2]. Также на основе постановлений Президента Республики Узбекистан последовательно внедряется компетентностный подход и современные педагогические технологии. В данной ситуации для педагогов-психологов становится особенно важной задача применения творческого подхода при работе с учащимися разных возрастов, поскольку это играет ключевую роль в повышении эффективности их профессиональной деятельности.

Творческое мышление – это способность человека решать проблемы, генерировать новые идеи и формировать нестандартные взгляды. Оно отличается от простых репродуктивных форм мышления, поскольку требует гибкости и оригинального подхода. В психологии существуют различные подходы к изучению креативного мышления, одним из которых является модель структуры интеллекта, предложенная американским психологом Джоем Полом Гилфордом (J.P. Guilford) [3].

Гилфорд в своих исследованиях разделил интеллект человека на несколько компонентов и представил его в виде трехмерной модели, включающей следующие основные элементы:

1. Операции мышления (Thinking operations) – процессы, с помощью которых функционирует интеллект.
2. Содержание (Content) – типы информации, с которыми работает мышление.
3. Продукты (Product) – результаты мыслительной деятельности.

В рамках данной модели креативное мышление описывается через понятие дивергентного мышления (Divergent Thinking), которое включает в себя:

1. Гибкость (Flexibility) – способность рассматривать проблему с разных точек зрения и находить нестандартные подходы.
2. Оригинальность (Originality) – поиск решений, отличающихся от общепринятых.
3. Беглость (Fluency) – способность генерировать множество идей при решении одной задачи.
4. Детализация (Elaboration) – развитие и уточнение существующих идей.

Гилфорд отмечал, что креативное мышление является независимой стороной интеллектуального развития. Его исследования показали, что творческое мышление связано не столько с высоким уровнем IQ, сколько с открытостью к новому и способностью находить необычные решения [4].

Несмотря на значимость модели Гилфорда в понимании креативного мышления, её применение на практике имеет определенные ограничения. В частности, Гилфорд рассматривал творческое мышление преимущественно как когнитивную способность, не уделяя достаточного внимания таким факторам, как мотивация, эмоциональное состояние и социальная среда.

Современные исследования в области когнитивной психологии и нейропсихологии подтверждают, что креативное мышление зависит не только от индивидуальных способностей, но и от окружающей среды, культурных условий и образовательной системы [5]. С точки зрения педагога-психолога, развитие творческого мышления требует не только формирования индивидуальных мыслительных навыков, но и создания креативной среды, психологической поддержки и применения инновационных подходов.

Кроме того, хотя модель Гилфорда акцентирует внимание на дивергентном мышлении, некоторые исследователи подчеркивают важность

его сочетания с конвергентным мышлением (Convergent Thinking) – способностью находить единственно верное, наиболее рациональное решение проблемы [3]. Таким образом, чем шире и гибче креативное мышление, тем важнее его сочетание с системным (конвергентным) мышлением для реального применения в жизни.

В условиях Узбекистана внедрение модели Гилфорда в образовательный процесс вполне возможно. Несмотря на реформы, практика показывает, что в обучении все еще преобладает репродуктивный подход, а учащиеся чаще ориентированы на поиск «правильного ответа», чем на генерацию новых идей. В связи с этим в педагогическом процессе важно сочетать методы развития дивергентного и конвергентного мышления.

Таким образом, в современной образовательной системе существуют различные подходы к развитию креативного мышления. Международные организации, такие как OECD и UNESCO, поддерживают внедрение инновационных образовательных стратегий. В частности, включение в программу PISA отдельного раздела по оценке креативного мышления демонстрирует растущую потребность в его формировании среди учащихся. Кроме того, в ряде стран успешно применяются программы, основанные на модели Гилфорда, что подтверждает её практическую значимость.

С учетом этого при подготовке будущих педагогов-психологов необходимо особое внимание уделять формированию их креативного мышления. В этом контексте важными направлениями являются:

Использование инновационных педагогических технологий (интерактивные игры, проектный метод, проблемное обучение);

- Развитие критического и дивергентного мышления;
- Создание креативной образовательной среды;
- Психологическая мотивация и поддержка творческой деятельности.

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КОРПОРАТИВНАЯ КУЛЬТУРА КАК ФАКТОР ТРАНСФОРМАЦИИ УПРАВЛЕНЧЕСКИХ ТЕХНОЛОГИЙ В ПРОМЫШЛЕННОСТИ

Аннотация. В данной статье в рамках теоретико-методологического подхода проанализировано влияние корпоративной культуры на выбор управленческих технологий в промышленных предприятиях. Раскрыто содержание понятия корпоративной культуры, её структурные элементы, этапы развития, основные принципы, а также взаимосвязь с современными технологиями управления. Представлены актуальные методические подходы к оценке корпоративной культуры, а также механизмы формирования эффективной системы управления на её основе.

Ключевые слова: *корпоративная культура, управленческие технологии, промышленное предприятие, трудовая среда, управленческие принципы, методы оценки, эффективность.*

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CORPORATE CULTURE AS A FACTOR IN THE TRANSFORMATION OF MANAGEMENT TECHNOLOGIES IN INDUSTRY

Abstract.This article analyzes the influence of corporate culture on the choice of management technologies in industrial enterprises within a theoretical and methodological framework. The concept of corporate culture is explored, including its structural elements, stages of development, fundamental principles, and its relationship with modern management technologies. The paper presents current methodological approaches to assessing corporate culture and outlines mechanisms for forming an effective management system based on it.

Keywords: corporate culture, management technologies, industrial enterprise, working environment, management principles, assessment methods, efficiency.

I. ВВЕДЕНИЕ

В условиях рыночной экономики эффективность деятельности промышленных предприятий напрямую зависит как от внешних, так и от внутренних факторов. Среди внутренних факторов особую роль играет сформированная в организации корпоративная культура. Она влияет не только на отношения между сотрудниками, но и на стиль руководства, процесс принятия решений, а также на выбор и внедрение инновационных технологий.

В настоящее время в промышленной отрасли Республики Узбекистан проводятся масштабные структурные реформы. В частности, в Постановлении Президента Республики Узбекистан Ш.М. Мирзиёева от 12 января 2022 года №PQ-78 «О приоритетных мерах по трансформации отраслей промышленности и их инновационному развитию» подчёркивается необходимость перехода промышленных предприятий к современной модели управления. В этом процессе решающую роль играет уровень развития корпоративной культуры.

Таким образом, изучение взаимосвязи между корпоративной культурой и управленческими технологиями имеет как теоретическое, так и прикладное значение. Иными словами, корпоративная культура становится определяющим фактором при выборе управленческих подходов, анализе стиля принятия решений руководства, а также при оценке степени участия сотрудников и их готовности к инновационным преобразованиям.

Следует особо отметить, что в последние годы внимание к внутренней организационной среде рассматривается как один из ключевых путей повышения конкурентоспособности и эффективности управления. В рамках «Стратегии развития – Новый Узбекистан» одним из приоритетов названы внедрение корпоративного управления в промышленности и применение современных подходов в управлении.

В связи с этим в настоящей статье проводится системный анализ влияния корпоративной культуры на выбор управленческих технологий в промышленных предприятиях. В качестве примеров используются данные по предприятиям промышленного сектора Узбекистана, где изучаются различные модели корпоративной культуры, анализируется их влияние на выбор технологий и формулируются научные выводы.

II. Обзор литературы

Вопрос эффективного управления внутренней средой предприятия является одним из ключевых направлений современной теории менеджмента. В этом процессе особое значение придаётся роли корпоративной культуры, что активно изучается как зарубежными, так и отечественными исследователями. Использованные в данной статье научные источники служат методологической основой для анализа теоретических основ корпоративной культуры, её структурных компонентов, критериев оценки, а также её влияния на управленческие технологии.

Одной из самых влиятельных концепций в данной области является теория различий между национальной и организационной культурой,

разработанная. Хофстеде (G. Hofstede) и изложенная в его работе Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations (первое издание – 1980 год, расширенное издание – 2001 год). Эта теория до сих пор широко используется как основная модель при оценке корпоративной культуры. Автор выделил пять (впоследствии – семь) измерений, по которым проводится анализ культуры организации. Особенно значимой эта модель считается для транснациональных компаний.

Д. Денисон (D. Denison) в своей работе Corporate Culture and Organizational Effectiveness (1990) подробно исследовал взаимосвязь между корпоративной культурой и эффективностью организации. Его методика основана на оценке таких факторов, как миссия, адаптивность, участие сотрудников и стабильность. Этот подход успешно применяется и в промышленных предприятиях.

Среди отечественных авторов можно отметить Е.А. Капитонова и Г.П. Зинченко, которые в своих работах *Основы корпоративной культуры* (2018) и *Организационная культура, и стратегический менеджмент* (2019) рассматривают корпоративную культуру как систему взаимосвязанных материальных и нематериальных ценностей внутри организации. Они подчёркивают, что внутренняя культура играет решающую роль при выборе управленческих технологий.

М.Ю. Овчаренко в труде Корпоративная культура: теория и практика (2020) выделяет социальные, интеллектуальные, духовные и коммуникативные аспекты корпоративной культуры и показывает, как каждый из них влияет на деятельность промышленных предприятий. Этот подход особенно актуален в условиях современного производственного процесса.

Следует также отметить, что в рамках Стратегии развития Республики Узбекистан на 2022–2026 годы особое внимание уделяется внедрению современных принципов управления, повышению квалификации персонала и развитию эффективных внутренних коммуникаций в организациях. Эти задачи непосредственно связаны с развитием корпоративной культуры.

III. Методология

Основной целью данного исследования является изучение влияния корпоративной культуры на выбор управленческих технологий в промышленных предприятиях. В качестве объекта исследования были выбраны предприятия различных отраслей промышленности Узбекистана, в том числе в сфере химии, нефти и газа, машиностроения и энергетики. Среди них как крупные, так и средние компании.

Предмет исследования – формы корпоративной культуры, существующие в организациях, и их влияние на процессы выбора управленческих технологий.

В исследовании были применены следующие научно-методологические подходы:

Системный анализ – позволил рассмотреть внутреннюю управленческую систему предприятия, его организационную структуру,

коммуникационные процессы и отношения между сотрудниками как единую систему.

1. **Сравнительный подход** – был использован для сопоставления моделей корпоративной культуры, таких как модели Хофстеде и Дила и Кеннеди, с практиками, наблюдаемыми в узбекских предприятиях, а также с зарубежным опытом.

2. **Эмпирические методы исследования**: – **Анкетирование** – сбор мнений руководителей и сотрудников предприятий относительно корпоративных ценностей и факторов, влияющих на выбор технологий. – **Полуструктурированные интервью** – проведены беседы с руководителями HR-отделов и технологических подразделений крупных промышленных компаний. – **Анализ документов** – изучение внутренних регламентов, политик внедрения технологий и корпоративных решений.

3. **Статистический анализ** – на основе собранных данных были выявлены ключевые тенденции, уровни взаимодействия и корреляции. Например, организации с «открытой» культурой внедряли инновационные технологии в 1,7 раза быстрее.

4. **Анализ нормативных документов** – изучены постановления Президента, решения Кабинета Министров, а также положения Стратегии развития «Новый Узбекистан», касающиеся корпоративного управления и трансформации.

5. В рамках выборки исследования были охвачены 15 промышленных предприятий. В каждом из них опрашивались руководители и сотрудники с опытом работы не менее 10 лет.

6. Комбинированное применение методологических подходов позволило достоверно проанализировать влияние разных форм корпоративной культуры на выбор управленческих технологий.

7. Результаты исследования показывают, что существующая форма корпоративной культуры напрямую влияет на процесс принятия управленческих решений, отношение к технологическим нововведениям, степень участия сотрудников и их инициативность.

Основные типы корпоративной культуры, встречающиеся в промышленности Узбекистана:

1. **Бюрократическая культура** – характеризуется жёсткой иерархией, централизованным принятием решений, низкой инновационной активностью. Внедрение новых технологий затруднено из-за нежелания сотрудников воспринимать изменения.

2. **Инновационная культура** – сотрудники имеют возможность высказывать мнение, вносить предложения. Решения принимаются коллективно, процессы трансформации проходят быстрее и эффективнее.

3. **Клановая (родственно-ориентированная) культура** – в некоторых организациях выбор технологий осуществляется на основе личных связей, а не объективных критериев, что снижает эффективность управленческих решений.

4. **Рыночная (конкурентная) культура** – в таких компаниях акцент делается на конкурентоспособность и внедрение инноваций, но это нередко сопровождается высоким уровнем стресса и давлением на персонал.

Каждый из этих типов по-разному влияет на внедрение технологий. Так, в условиях бюрократической культуры внедрение ERP-систем оказалось затруднённым, тогда как предприятия с инновационной культурой проходили цифровую трансформацию с меньшими трудностями.

Эмпирический анализ и примеры

В рамках исследования было опрошено 15 промышленных предприятий в разных регионах Узбекистана. 62% респондентов составляли руководители среднего и высшего звена, остальные – специалисты и технические сотрудники.

Выявленные тенденции:

1. В компаниях с высокой степенью открытости (например, «Хоразм Автоматика», «Фергана Химия») управленческие технологии (ERP, электронный документооборот, Lean-менеджмент) внедрялись быстрее.

2. В организациях с авторитарной культурой (например, «Ташкентский нефтеперерабатывающий завод») технологические новшества зависели исключительно от инициативы руководства и встречали пассивное восприятие со стороны персонала.

3. В компаниях с высоким уровнем вовлечённости персонала решения по технологиям принимались более стабильно и стратегически. Например, в «НавоийЭнергоМаш» обсуждение технологических решений с сотрудниками стало нормой, что ускорило их внедрение.

4. 74% участников подтвердили наличие прямой связи между корпоративными ценностями и технологическими решениями. Часто повторяемое мнение: «Если внутренняя культура компании готова к изменениям, любая система управления будет работать без проблем».

5. Пример из интервью: «Раньше все решения принимал только директор. Теперь обсуждаем коллективно. Поэтому такие системы, как мониторинг по KPI, внедряются гораздо быстрее» (HR-директор, «Андижанмаш»).

Эти данные подтверждают, что тип корпоративной культуры существенно влияет на восприятие и реализацию управленческих технологий. Открытость, участие и готовность к инновациям – ключевые факторы успешной трансформации.

IV. Анализ и результаты

Результаты исследования показывают, что выбор управленческих технологий на промышленных предприятиях непосредственно связан с уровнем развития корпоративной культуры. Эта взаимосвязь была проанализирована с опорой на теории корпоративной культуры, предложенные такими исследователями, как Г. Хофстеде (1980) и Дил и Кеннеди (1982).

Согласно модели Хофстеде, в промышленных организациях Узбекистана преобладают черты сильной иерархии и коллективизма. Это соответствует высокой степени дистанции власти (power distance) и низкому уровню индивидуализма. В подобных условиях инициатива по внедрению новых управленческих технологий, как правило, исходит исключительно от высшего руководства, а вовлечённость рядовых сотрудников остаётся ограниченной.

Согласно модели Дила и Кеннеди, организационная культура формируется под влиянием двух ключевых факторов: уровня риска и степени обратной связи. В ходе исследования было установлено, что в компаниях с инновационной культурой присутствует налаженная система быстрой коммуникации и механизмов обучения на ошибках. Это, в свою очередь, способствует успешному внедрению таких технологий, как Lean-менеджмент, мониторинг по ключевым показателям эффективности (KPI), цифровые системы управления.

Напротив, в компаниях с бюрократической или клановой (ориентированной на родственные связи) культурой доминируют субъективные подходы при выборе управленческих решений. Это нередко приводит к неэффективным технологическим выборам, снижению результативности и исключению персонала из процесса трансформации.

С этих позиций можно утверждать, что для успешной реализации современных управленческих технологий предприятие должно обладать:

– открытой к инновациям и изменениям культурой,

–культурой, основанной на вовлечённости сотрудников,

–системой, в которой предложения персонала учитываются,

– стратегическим подходом к выбору и внедрению технологий.

Кроме того, в *Стратегии развития Республики Узбекистан на 2022–2026 годы*, предложенной Президентом, подчёркивается важность цифровизации экономики, трансформации промышленности и развития корпоративного управления. При этом особое внимание уделяется человеческому капиталу и внутренней организационной культуре как ключевым факторам успешных реформ.

Сравнение с результатами других исследований (например, Kazim & Syed, 2019; Chen et al., 2020) подтверждает, что культура внутри организации – это опорный элемент технологических трансформаций. Иначе говоря, одна и та же технология может давать принципиально разные результаты в зависимости от корпоративной среды, в которой она применяется.

Таким образом, проведённый анализ показывает: для эффективного выбора управленческих технологий необходимо прежде всего формировать культурную, открытую и основанную на участии внутреннюю среду предприятия.

V. Выводы и предложения

Анализ, представленный в данной работе, позволяет сделать вывод о том, что выбор управленческих технологий в промышленных предприятиях

определяется не только внешними требованиями и технико-экономическими показателями, но в значительной степени зависит от уровня развития внутренней корпоративной культуры.

На основе результатов исследования сформулированы следующие ключевые выводы:

1. **Корпоративная культура выступает решающим фактором при выборе управленческих технологий.** Особенно это проявляется в организациях с высокой степенью открытости, активностью сотрудников и вовлечённостью персонала – здесь новые технологии внедряются быстрее и эффективнее.

2. **В компаниях с бюрократической или авторитарной культурой процессы внедрения технологий замедляются,** повышается сопротивление со стороны персонала, а инновационный потенциал оказывается ограниченным.

3. **Эмпирические данные показывают,** что успех технологических решений во многом зависит от корпоративных ценностей, стиля лидерства и существующих механизмов коммуникации.

4. **Стратегические направления, определённые в президентских указах** – такие как цифровая трансформация и внедрение современных управленческих подходов – не могут быть реализованы в полной мере без предварительного реформирования корпоративной культуры.

На основании вышеизложенного предлагаются следующие научные и практические рекомендации:

– Необходимо внедрить систему оценки корпоративной культуры в промышленных предприятиях и интегрировать её в общую управленческую стратегию.

– Перед внедрением новых технологий следует изучить уровень готовности персонала, организовать тренинги и провести обсуждения на основе принципов участия.

– В процессе цифровой трансформации следует обращать внимание не только на техническую инфраструктуру, но и на культурную подготовленность коллектива.

– Целесообразно разработать национальную «дорожную карту» развития корпоративной культуры для промышленных предприятий Узбекистана.

Полученные в статье результаты могут способствовать более глубокому пониманию взаимосвязи между корпоративной культурой и технологическими решениями, а также служить основой для повышения эффективности управления на промышленных предприятиях.

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ФОРМИРОВАНИЕ ПАРАДИГМАЛЬНОЙ ТЕОРИИ РЕГИОНАЛЬНОЙ ЭКОНОМИКИ

Аннотация: *В статье делается вывод, что формирование парадигмы современной региональной экономики должно основываться на нескольких базовых принципах, среди которых — рассмотрение региональной экономики как сложноорганизованной развивающейся научной дисциплины; территориальность как доминантный признак любого исследования в рамках региональной экономики; императив любого исследования, претендующего на принадлежность к региональной экономике — установление не только общих закономерностей развития и организации хозяйственной жизни на территории, но и выявление ее региональной (местной) специфики.*

Ключевые слова: *региональная экономика, экономическая география, регион, экономическое районирование, размещение производственных сил, пространственное развитие, региональное развитие.*

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FORMATION OF A PARADIGM THEORY OF REGIONAL ECONOMY

Abstract: *The article concludes that the formation of a paradigm of modern regional economy should be based on several basic principles, including the consideration of regional economy as a complexly organized developing scientific discipline; territoriality as a dominant feature of any study within the framework of regional economy; the imperative of any study claiming to belong to regional economy is the establishment of not only general patterns of development and organization of economic life in the territory, but also the identification of its regional (local) specificity.*

Keywords: *regional economy, economic geography, region, economic zoning, placement of production forces, spatial development, regional development.*

Региональная экономика является важнейшей отраслью современной экономической науки, развивая ее традиционные разделы областью исследования закономерностей формирования и развития территориальных социально-экономических систем различных типов и размеров, размещения производства, распределения созданного и накопленного богатства по территории страны. Интерес к региональной экономике заметно возрос в учебном процессе экономических и других вузов страны.[1]

Как бы ни было велико, желание начать эту статью сразу с анализа современного состояния теоретических аспектов региональной экономики, представляется необходимым ввести краткий экскурс в историю ее зарождения и развития.

Во-первых, суждения и модусы прежних научных представлений о региональной экономике, сформированные в позднесоветский период, сохранились и их след в ее современных определениях и интерпретациях весьма заметен. И этот след не всегда вписывается в формирующуюся рыночную реальность.

Во-вторых, Узбекистан унаследовал региональную систему, сложившуюся в советский период, по сути, в другом государстве, инерция которого оказалась чрезвычайно высокой. На пути к созданию современного эффективного управления региональным развитием серьезным барьером оказалась архаичная территориальная структура страны.

В-третьих, региональная экономика в настоящее время остается одной из немногих дисциплин в научном сообществе, изучающей теоретические и прикладные проблемы размещения производительных сил, которые традиционно изучала советская наука.

Новое понимание природы производительных сил, теоретическое осмысление пространства, его обустройства в интересах развития неизбежно приводит к изменению теории размещения производства, которая остается стержнем региональной экономики.

Истоки возникновения региональной экономики.

Учитывая, что каждая научная дисциплина, каждое научное направление возникает в неразрывной связи с практическими потребностями общества, а возникновение региональной экономики в свое время было инициировано необходимостью практического решения сложных проблем хозяйственного освоения и обустройства огромного российского пространства, повышения отдачи совокупного потенциала государственной территории, экономического районирования страны, территориального развития, рационального размещения производительных сил, создания эффективных территориально-производственных комплексов и т. д.

Прежде всего, следует выделить исследования ученых по раскрытию содержания и сущности экономического районирования страны.

Во-первых, регион представлялся как целостная территория (пространство, зона, пояс и т. п.), четко обозначенная на карте и отличающаяся совокупностью некоторых специфических (уникальных)

взаимосвязанных признаков, явлений, обладающая внутренним единством входящих в ее состав компонентов и отличающаяся от смежных территорий этими же признаками.

Во-вторых, районирование, ставящее своей целью разделение территории государства на отдельные части на основе общности общегеографических, социально-культурных, экономических, этнодемографических и других признаков и процессов на данном историческом этапе, решало познавательные задачи, поскольку позволяло глубже познать территорию.

В-третьих, районирование имело определенное прикладное значение, поскольку было направлено на выявление экономически целостных регионов (территорий), обладающих внутренним единством, в пределах которых могли осуществляться какие-либо регулирующие административно-хозяйственные действия.

Основные направления региональных исследований (затем территориальных) были связаны с выявлением коренных сдвигов в размещении производительных сил, обоснованием нового характера экономического районирования, рассмотрением с разных сторон проблемы факторов размещения производства в целом и отдельных его отраслей, разработкой программ формирования крупных территориально-производственных комплексов, ориентированных прежде всего на освоение природных ресурсов, созданием методологических основ системы территориального планирования и управления.[2]

Главной научной организацией по прикладным региональным исследованиям с 1930 года, является Совет по изучению производительных сил (СИПС).

Решающий вклад в разработку теории экономического районирования, формирования территориально-производственных комплексов, в изучение проблем рационального размещения производительных сил, территориального разделения труда и комплексного развития регионов нашей страны внесли советские экономико-географы, среди которых были Н. Н. Баранский, Н. Н. Колосовский, Ю. Г. Саушкин, Л. Л. Никитин, Г. Н. Черданцев, В. М. Четыркин, А. Т. Хрущев, М. Д. Шарыгин и другие, а также такие известные экономисты, как И. Г. Александров, Г. М. Кржижановский, Н. Н. Некрасов, П. М. Алампиев, В. Ф. Васютин, Я. Г. Фейгин, А. Е. Пробст, В. Ф. Павленко, Л. А. Козлов, А. Г. Гранберг, Б. М. Штульберг, В. П. Можин, М. К. Бандман, Р. И. Шнипер и др. [3]

Изучение проблем размещения производства, специфики проявления экономических процессов в территориальном аспекте осуществлялось под определяющим влиянием государственных структур и господствующей идеологии. Экономическое районирование, понимаемое как результат размещения производительных сил, трактуемое как возможность строительства на территории отдельных регионов гигантских территориально-производственных комплексов и огромных фабрик,

представлялось как важнейшее преимущество социалистического способа производства [4].

Региональное развитие, означающее фиксацию территориального многообразия, закрепление региональной и локальной самоидентификации, самобытных местных технологий и самобытных традиций региональных сообществ, было чуждо законам функционирования командно-централизованной экономики. Да и сам термин «регион», наряду с широко используемым термином «район», стал входить в научный оборот географов и экономистов лишь в начале 1970-х годов.

Общественные науки, в том числе экономика и экономическая география, развивались практически независимо от достижений зарубежной мысли. Основные труды И. Тюнена, А. Вебера, А. Леша, В. Изарда, П. Хаггетта и Х. Босса, переведенные на русский язык в разное время, не оказали существенного влияния на теоретические воззрения советских ученых в области размещения производства и регионального развития [5].

Популярные теории западной регионоведения, теории размещения производства, методы экономического анализа и экономического районирования, теории полюсов роста и поляризованного развития, теории длинных волн и производственных циклов, концепции городского развития были подвергнуты резкой критике с позиций марксистско-ленинской идеологии, и было доказано безусловное превосходство советской практики размещения производительных сил [6].

Формирование региональной экономики за рубежом как полноценного элемента экономической науки можно отнести к концу 1950-х — началу 1960-х годов. Региональная экономика включала в себя не только собственно региональную экономику, которая фокусируется на изучении экономики отдельных регионов, на объяснении причин возникновения и особенностей региональных проблем, но и обширное направление так называемой городской экономики, а также вобрала в себя теории межрегиональной торговли, теории роста городов, теории размещения. [7]

Региональная экономика, будучи генетически связанной с экономической теорией, была призвана обеспечить «проекцию» макроэкономических процессов и параметров конкретного народного хозяйства на территориальный уровень, на уровень регионов и городов с учетом существующих межрегиональных связей и отношений. Обширный комплекс проблем размещения производительных сил, пространственный аспект различных экономических явлений и процессов должен быть в центре внимания новой специальной отрасли экономической науки со своим предметом исследования, своими целевыми установками, задачами и методами исследования.

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ВЛИЯНИЕ ИЗМЕНЕНИЯ КЛИМАТА НА ПОЧВЫ И ИХ СОСТОЯНИЕ В КОКАНДСКОЙ ОАЗИСЕ

Аннотация: *В данной статье рассматриваются глобальные изменения климата и их негативное воздействие на компоненты природы, а также исследование почв региона Кокандской долины. Проанализированы изменения в площади орошаемых земель и уровень засоленности в разных районах в условиях климатических изменений. Создана картографическая схема мелиоративного состояния орошаемых земель в Кокандской долине.*
Ключевые слова: *изменение климата, Кокандская долина, почвенный покров, засоление.*

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THE IMPACT OF CLIMATE CHANGE ON SOILS AND THEIR CONDITION IN THE KOKAND OASIS.

Abstract: *This article discusses global climate change and its negative impact on environmental components, as well as the study of soils in the Kokand Oasis. The changes in the irrigated land area and the level of salinization in different districts under climate change conditions are analyzed. A map scheme of the reclamation status of irrigated lands in the Kokand Oasis has been created.*
Keywords: *climate change, Kokand Oasis, soil cover, salinization.*

Повышение температуры приведет к исчезновению 1 млн видов флоры и фауны и сокращению биологического разнообразия на 6-10% к 2050 году, а к 2100 году этот показатель может достичь 13-27%. Кроме того, повышение температуры вызывает раннее цветение растений, что, в свою очередь, нарушает сроки опыления [6].

Изменение климата — это изменение климатических условий, вызванное как природными, так и антропогенными факторами, которое оказывает влияние на все живые организмы. Природные факторы изменяют климат на протяжении долгого времени и являются постоянным процессом, в то время как антропогенные воздействия происходят в короткий период и их влияние на живые организмы более опасно. Изменение климата может привести к исчезновению видов растений, снижению генетического

разнообразия, а также негативно сказаться на прорастании, росте и размножении растений. Например, такие климатические явления, как засуха, наводнения, солнечная радиация, создают серьезную угрозу для растений [4].

Закон Республики Узбекистан "О защите растений", а также указ Президента от 24.06.2024 года № PQ-233 "О создании устойчивых агроэкосистем в условиях изменения климата и повышении адаптивности сельскохозяйственных производителей к рискам, связанным с изменением климата" направлены на защиту и адаптацию растений в условиях изменения климата, увеличение площади зеленых зон, предотвращение деградации почвы и пастбищных земель [7].

Информацию о почве и ее формировании можно найти в работах таких ученых, как В.В. Бартольд (1914), Л.С. Берг (1926), С.С. Неструев (1931), В.В. Никитин (1926), Н.А. Димо (1915), И.П. Герасимов (1933), В.А. Ковла (1946, 1947), а также Н.В. Богданович, Н.В. Кимберг и А.З. Генусов в 1950-60-е годы. Вопросы загрязнения почвы и факторов, влияющих на почву, изучались такими учеными, как Х.Т. Рискиева, Р.К. Козиедов, Л.А. Гофурова, Х.К. Турсунов, Г. Юлдашев, Ш. Холиков, Р. Эшчонов, Т. Абдурахманов и З. Джабборов [3].

Почвы Ферганской долины в Узбекистане были тщательно изучены и представлены в работах таких ученых, как Б.В. Горбунов (1957), М.А. Панкев (1957), С.А. Шувалов (1957), Г.И. Рейченко (1960), А. Максудов (1979, 1990, 1993) и Г. Юлдашев (2000, 2010, 2012) [2]. Почвы долины Ферганы имеют различные характеристики и изменяются в зависимости от широты и высоты. В долине традиционно ведется орошение и земледелие, и поэтому здесь развиваются орошаемые почвы.

Почвы орошаемых земель, как правило, образуются в долинах рек, на равнинах и в предгорьях. В Центральной Азии орошаемые почвы являются основой для ведения сельского хозяйства. Почвы Ферганской долины подразделяются на несколько типов, включая легкие и средние песчаные почвы, а также шоркованные и з асоленные почвы [1].

В последние десятилетия предпринимаются меры по улучшению качества почвы и борьбе с деградацией, включая инициативы по увеличению содержания гумуса в почвах и сокращению уровня засоления.

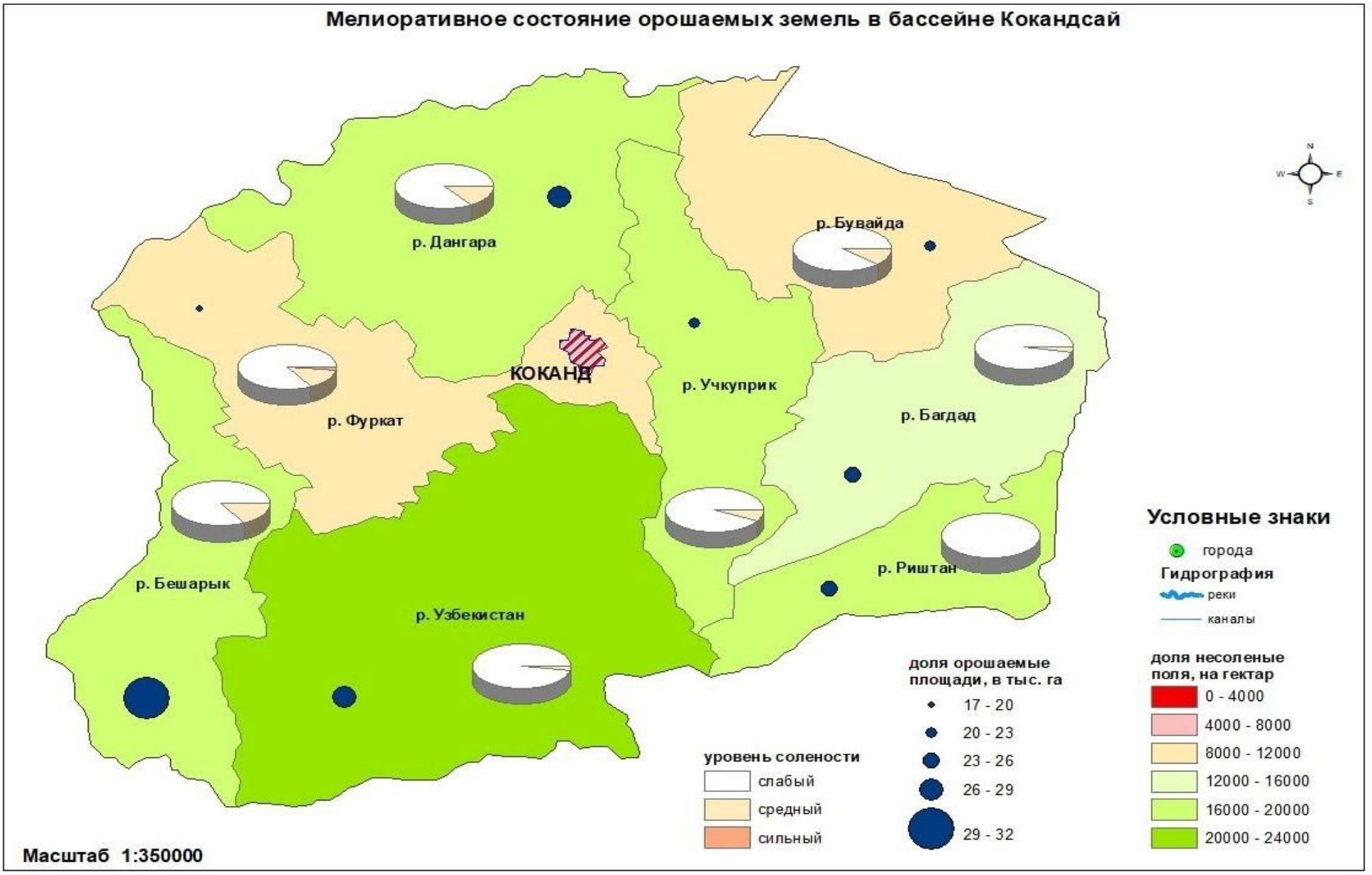
Данные исследования показывают, что в 2010-2012 годах на орошаемых землях Ферганской долины уровень засоления составлял 66%. К 2022 году этот показатель был снижен до 32%, что является результатом внедрения эффективных технологий и мер по улучшению управления водными ресурсами и использованием удобрений.

В Ферганской долине уровень засоления почв на орошаемых землях напрямую зависит от расположения грунтовых вод (см. таблицу 1). Состав и степень минерализации грунтовых вод имеют важное значение для данной территории. На данный момент, уровень засоления на орошаемых землях в районе Коканда составляет:

1. Слабое засоление — 79 125 га (93%)

2. Среднее засоление — 5 572 га (6,6%)
3. Сильное засоление — 150 га (0,1%)

Как уже упоминалось, в 2022 году площадь орошаемых земель в Кокандской долине составила 170 972 га, из которых 32% (или 55 337 га) представляют собой земли с разной степенью засоленности.


Мелиоративное состояние орошаемых земель в бассейне Кокандсай
р. Дангара
р. Бувайда
КОКАНД
р. Учкуприк
р. Фуркат
р. Багдад
р. Бешарык
р. Узбекистан
р. Риштан
Условные знаки
города
Гидрография
реки
каналы
доля несоленые поля, на гектар
0 - 4000
4000 - 8000
8000 - 12000
12000 - 16000
16000 - 20000
20000 - 24000
доля орошаемые площади, в тыс. га
17 - 20
20 - 23
23 - 26
26 - 29
29 - 32
уровень солености
слабый
средный
сильный
Масштаб 1:350000

Если проанализировать уровень засоления земель на орошаемых участках Кокандской долины, то можно отметить, что в таких районах, как:

- В **Дангаринском районе** — 27%,
- В **Учкуприкском районе** — 11%,
- В **Бувайдинском и Багдадском районах** — 47%,
- В **Узбекистанском районе** — 9%,
- В **Фуркатском районе** — 42%,
- В **Бешарикском районе** — 49% имеют разные степени засоленности.

По степени засоленности земель можно разделить районы на 3 группы:

1. **Узбекистанский и Учкуприкский районы**;
2. **Дангаринский район**;
3. **Фуркатский, Бувайдинский, Багдадский и Бешарикский районы**.

Засоление земель на орошаемых участках в Озбекистанском и Учкуприкском районах занимает меньше площади по сравнению с остальными районами. Однако в Фуркатском, Бувайдинском, Багдадском и Бешарикском районах уровень засоленности выше среднего показателя по долине, особенно в Фуркатском районе, где 150 гектаров территории относятся к зонам с сильным засолением.

Основываясь на вышеизложенных данных, можно утверждать, что формирование почв Кокандской долины зависит от географического положения региона, рельефа, близости или удаленности грунтовых вод от поверхности земли, а также от воздействия климатических факторов. Так как основная часть Кокандской долины является сельскохозяйственным регионом, то большинство почв здесь принадлежат к типам, которые подверглись культурным изменениям.

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МЕТОДЫ РАЗВИТИЯ ТВОРЧЕСКОГО МЫШЛЕНИЯ ОБУЧАЮЩИХСЯ ПОСРЕДСТВОМ ФОРТЕПИАННОГО АНСАМБЛЕВОГО МУЗИЦИРОВАНИЯ (НА МАТЕРИАЛЕ ВЕНГЕРСКИХ ТАНЦЕВ ИОГАННЕСА БРАМСА)

Аннотация. *Воспитание ансамблевой культуры музыканта-исполнителя является одной из важнейших целей и задач музыкального образования и требует неустанных поисков в их решении, разработки новых методов и форм обучения, которые предлагаются в данной статье. На основе многолетней педагогической и исполнительской практики автор делится опытом развития творческого мышления обучаемых в процессе изучения ансамблевого музицирования на материале Венгерских танцев для фортепиано в четыре руки Иоганнеса Брамса.*

Ключевые слова: *фортепианный ансамбль, музицирование, художественное содержание, творческое мышление, венгерские танцы, фактура, метод, стиль, исполнение, мастерство, вдохновение, тембр, форма, агогика, синхронность.*

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METHODS OF DEVELOPING STUDENTS' CREATIVE THINKING THROUGH PIANO ENSEMBLE MUSIC-MAKING (BASED ON JOHANNES BRAHMS' HUNGARIAN DANCES)

Abstract. *Nurturing the ensemble culture of musicians-performers is one of the most crucial aims and tasks of music education. It demands relentless search of solutions as well as development of new methods and forms of education, some of which are offered in this article. The author is sharing her experience in developing of creative thinking of students based on her long-lasting performance and pedagogical practice. J. Brahms' Hungarian Dances for four hands are given as study example.*

Key words: *piano ensemble, music-making, artistic content, creative thinking, Hungarian dances, texture, method, style, interpretation, mastery, inspiration, timbre, form, agogic, timing.*

Фортепианный ансамбль является одним из видов коллективного музицирования, способствующих коммуникации, развитию творческого общения музыкантов-исполнителей. На протяжении многих веков ансамблевое искусство совершенствовалось и обогащалось как новыми сочинениями, переложениями, аранжировками для данного вида музыкального исполнительства, так и методами освоения этих сочинений, разработками специальных классов и дисциплин, изучающих ансамблевое мастерство.

В наше время фортепианный ансамбль представляет собой как самостоятельную профилирующую дисциплину, так и неотъемлемую составляющую класса специального фортепиано. Это прежде всего обусловлено актуальностью и потребностью фортепианного ансамбля в современном музыкальном образовании. Из сферы домашнего любительского музицирования фортепианный ансамбль в процессе исторического развития обрёл свою профессиональную компетентность и стал важнейшей составляющей частью обучения игре на фортепиано. В то же время приходится констатировать, что фортепианный ансамбль в известной мере утратил в наше время функцию домашнего музицирования.

Работа педагога по освоению студентами навыков фортепианного ансамблевого музицирования представляет собой сложный творческий процесс. «Первостепенной задачей ансамблевого музицирования является умение слышать «в целом» музыку, которая рождается при совместном исполнении. Решение этой художественной задачи требует от пианистов – участников ансамбля – развития специфических ансамблевых навыков» [4, с. 21].

В развитии ансамблевых навыков пианистов весьма целесообразно обращаться к разучиванию небольших пьес жанрового плана, основанных на фольклорном материале с легко запоминающимся тематическим материалом, ясной формообразующей структурой, диалогичным соотношением партий, взаимодополняющих друг друга. В качестве такого материала могут быть Венгерские танцы Иоганнеса Брамса, к рассмотрению которых мы обращаемся в нашей работе и делимся опытом, накопленным в этом плане. Они предназначены для исполнения на фортепиано в четыре руки. «Названные произведения снискали всесветную популярность, переложены для многих инструментов и оркестровых составов. Популярность вполне заслужена – такое очарование присуще этим пьесам, то исполненным бесхитростного лиризма, то пленяющим энергией, задором. Всюду ярко проступает мастерство Брамса в передаче открытого, непосредственного чувства» [2, с. 73].

Обратившись к художественной обработке венгерских народных танцевальных мелодий, Брамс одухотворил свои Венгерские танцы могучей силой таланта, профессионального искусства и вдохновения, что обеспечило их устойчивую жизнеспособность до наших дней. Хранитель музея Общества

любителей музыки в Вене, музыковед Карл Гейрингер в своей монографии о Брамсе подчеркивал: «Не без основания эти танцы имеют беспримерный успех. Ибо Брамс умеет неподдельно выразить своеобразную мелодику, гармонию и ритмику цыганской музыки и, в то же время, благодаря художественной обработке поднять её на большую высоту» [1, с. 232].

Естественно, что непревзойденное мастерство композитора стимулирует и мастерство исполнительского искусства, активизирует творческое мышление пианистов, вызывает стремление к яркому и эмоциональному воплощению звуковых образов. «Пианизм «Венгерских танцев», – отметила исследователь фортепианного дуэта, доктор искусствоведения Е. Сорокина, – одно из высших завоеваний в истории развития четырехручной музыки» [5, с.158]. Поэтому каждый, обучающийся игре на фортепиано, должен ознакомиться хотя бы с одним из Венгерских танцев Брамса.

Существует четыре серии Венгерских танцев, создаваемых Брамсом в течение ряда лет. «Они являются обработками венгерских народных мелодий, которые Брамс начал собирать ещё в юности, во время концертных поездок со скрипачом Эде Ременьи» [5, с.157]. В обработках венгерских народных мелодий ощущался индивидуальный композиторский стиль Брамса, присущие его авторскому почерку приёмы развития музыкального материала, особенности варьирования. Венгерские танцы характеризуются масштабностью звукового поля, широким охватом всех регистров инструмента. «В фортепианных ансамблях Брамс нашел такую форму выражения художественных идей, которая по внутреннему масштабу не уступает симфонии и вместе с тем свободна от тех обстоятельств перед традицией, которые накладывает симфонический жанр» [6, с.104]. Приведенная нами характеристика фортепианных ансамблей исследователя творчества Брамса, доктора искусствоведения Е. Царевой имеет важное значение для понимания пианистом глубокой художественной содержательной сущности Венгерских танцев.

Венгерские танцы Брамса предоставляют педагогу благодатный материал для выработки навыков фортепианного ансамбля обучающимися, развития и совершенствования их творческого мышления. В работе над Венгерскими танцами целесообразно применять следующие методы изучения и освоения:

- аналитический;
- технологический;
- комплексный;
- коммуникативный.

Аналитический метод изучения музыкального произведения состоит в рассмотрении его жанра, формы и стиля, определение особенностей музыкального языка. Технологический метод освоения музыкального произведения направлен на выявление технических трудностей и определение приемов и способов их преодоления. Комплексный метод имеет

синтезирующий характер и объединяет опыт анализа музыки и технологии игры. Коммуникативный метод направлен на выработку ансамблевых качеств исполнителей, их умение слушать и слышать друг друга, ощущать себя участниками единого целого. Данные методы способствуют развитию творческого мышления обучаемых и предполагают следующие аспекты рассмотрения:

- когнитивно-творческий;
- интеллектуально-креативный;
- культурно-коммуникативный;
- концертно-артистический.

Научное осмысление и практическая реализация данных аспектов творческой деятельности фортепианного ансамбля направлены в итоге к главной цели – выступлению ансамблистов на концертной сцене.

Обращаясь к конкретным примерам, прежде всего обратим внимание на Венгерский танец №1, g-moll как типичный образец брамсовского художественного воплощения данного жанра. Этот популярнейший танец, как и большинство других, имеет двухчастное строение в соответствии с венгерской национальной традицией танцевальной культуры. В первом разделе исполнителям надлежит передать плавный, величественный, напевный характер музыки, эмоциональную ауру лирического состояния духа, дополняемую легчайшими полетными шестнадцатыми в верхнем регистре инструмента.

Во второй части пьесы музыка приобретает характер стремительной, вихревой пляски. Исполняя эту часть пьесы, ансамблистам необходимо ярко и темпераментно сыграть концовку типа вербункош, добиваясь синхронности. В связи с этим, педагогу следует рассказать исполнителям о вербункоше — характерном стиле венгерской народной и профессиональной музыки, обратить внимание на его межкультурную коммуникационную основу.

Рассматривая феномен вербункоша, венгерский музыковед Бенце Сабольчи в своем фундаментальном труде «История венгерской музыки» отмечал: «Среди пока малоизученных истоков вербункоша ясно распознаются традиции старинного народного музицирования (танец гайдуков, танец свинопасов, влияние мусульманского и некоторых ближневосточных балканских и славянских стилей, воспринятые, вероятно, через цыган. Кроме того, в вербункоше есть элементы венско-итальянской музыки» [3, с.55]. Действительно, в Венгерских танцах Брамса все обозначенные этим ученым элементы вербункоша отражаются и придают им неповторимое очарование, воспринимаемое слушателем любой национальности.

Венгерский танец №4, f-moll привлекает своей насыщенной эмоционально-драматичной образностью. Песенная мелодия этой пьесы получает богатое темброво-колористичное развитие, подвергается вариационным и вариантным методам обработки народного мелоса, благодаря чему здесь возникают новые виртуозные приёмы разнообразной и

изобретательной ансамблевой фактуры. Брамс охватывает в этой пьесе все регистры фортепиано, что создаёт объемную, симфоническую в своей масштабности пространственную звуковую сферу. Благодаря этому популярная цыганская песенная мелодия одухотворяется и приобретает высокохудожественный смысл.

Венгерский танец №6, Des-dur – это типичный чардаш, с присущей ему огненной стремительностью и резкими сменами темпа. «Чардаш по форме и ритмам непосредственно связан с поздним вербункошем» [3, с. 65]. Сложность чардаша заключается в его амбивалентной структуре, сопряжении плавных, мелодических формул и зажигательных, темпераментных эмоциональных взлётов. Наличие круговых форм танцевальных движений придаёт чардашу особую семантику, наполняет его духовным смыслом художественного содержания.

Следует отметить, что работа педагога над фортепианными ансамблями имеет значимость для развития творческого мышления не только обучающихся пианистов, но и обучающего их педагога. Изучение Венгерских танцев открывает перспективы научного и просветительского направления профессионального развития музыкантов-исполнителей. Необходимо подчеркнуть значимость Венгерских танцев Брамса в развитии свободы творческих инициатив, к которым призывает музыка данных пьес, предполагающая индивидуально-творческие формы исполнительской интерпретации, применение выразительных возможностей агогики, четкой и слаженной синхронности ансамблистов.

Использование агогических выразительных средств требует высокого художественного вкуса и такта, соответствия музыкальному стилю Венгерских танцев Брамса. Формируя исполнительский состав партнёров в фортепианном ансамбле, целесообразно чередовать их в партиях *primo* и *secondo*, и в процессе репетиционных занятий утвердить наиболее удачный состав исполнителей для выступления на концертной сцене. Изучение Венгерских танцев Брамса открывает широкие возможности ансамблевого музицирования и путь к исполнительской интерпретации сложных и масштабных современных сочинений для фортепианного ансамбля, всегда предполагающие межкультурные коммуникации.

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ГЛОБАЛЬНЫЕ МИГРАЦИОННЫЕ ПРОЦЕССЫ И ИХ ПОЛИТИЧЕСКИЕ ПОСЛЕДСТВИЯ

Аннотация: *Данная статья посвящена актуальным проблемам миграции в современном мире. Миграция представляет собой процесс перемещения населения как внутри страны, так и за её пределами, с целью постоянного места жительства или временного пребывания. В современном мире миграция населения приобретает глобальный характер. Это является следствием экономических, политических, социальных и культурных преобразований. В результате анализа мы раскрыли сущность основных последствий миграционных процессов. Результатом миграции является рост населения, что влечет за собой избыток рабочей силы. Огромные масштабы приобретает нелегальная иммиграция. Следствием миграции является столкновение и диффузия разных культур, религиозных и национальных традиций. Миграция активизирует мировой рынок высококвалифицированной рабочей силы. Поэтому одной из главных задач любого государства является разработка и реализация эффективной миграционной политики, направленной на устранение отрицательных последствий миграционных процессов.*

Ключевые слова: *глобальная миграция, политические последствия, безопасность, международное сотрудничество, политика, социальная интеграция.*

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GLOBAL MIGRATION PROCESSES AND THEIR POLITICAL CONSEQUENCES

Abstract: *This article is devoted to the current problems of migration in the modern world. Migration is the process of population movement both within and outside the country, for the purpose of permanent residence or temporary stay. In the modern world, population migration is becoming global. This is a consequence of economic, political, social and cultural transformations. As a result of the analysis, we revealed the essence of the main consequences of migration processes. The result of migration is population growth, which entails an excess of labor.*

Illegal immigration is acquiring enormous proportions. The consequence of migration is the clash and diffusion of different cultures, religious and national traditions. Migration activates the world market of highly skilled labor. Therefore, one of the main tasks of any state is the development and implementation of an effective migration policy aimed at eliminating the negative consequences of migration processes.

Keywords: *global migration, political consequences, security, international cooperation, politics, social integration.*

I.Введение

Люди с момента своего появления находятся в постоянном движении: естественном (рождаются, умирают), социальном (меняют свой социальный статус, профессии, сферу деятельности и т. д.), миграционном (совершают пространственные перемещения). Но именно благодаря миграции произошло расселение человека по земному шару. Облик современного мира является иллюстрацией результатов миграционных процессов.

Миграция населения в XXI в. приобрела огромные масштабы. По оценкам Отдела народонаселения Департамента по экономическим и социальным вопросам Организации Объединенных Наций, сегодня в мире с населением 7 млрд человек по крайней мере 214 млн проживают за пределами стран, где они родились. Если бы все международные мигранты создали собственную страну, то по количеству населения она занимала бы шестое место в мире (1).

В научной литературе миграцию населения определяют как «любое территориальное перемещение населения, связанное с пересечением как внешних, так и внутренних границ административно-территориальных образований с целью смены постоянного места жительства или временного пребывания на территории для осуществления учебы или трудовой деятельности независимо от того, под превалирующим воздействием каких факторов оно происходит – притягивающих или выталкивающих» (2). Кроме того миграцию рассматривают как сложный социальный процесс, затрагивающий многие сферы жизнедеятельности общества, поскольку миграции сыграли важную роль в истории человечества, с ними связаны процессы развития родо–племенных отношений, освоение земель, образование различных рас, культур, языков и народов. В настоящее время наблюдается интенсивное расширение миграционных потоков и вместе с тем, процесс миграции стал составляющим фактором всех глобальных изменений.

Миграция населения в настоящее время приобретает глобальный характер и одновременно является признаком самой глобализации (5). Глобализация, как известно, является процессом объединения народов, государств; ведет к стиранию границ между народами и созданию единого политического, экономического и духовного пространства. Она объединяет в общую систему, в мировой рынок экономические системы различных государств, что способствует изменению и культуры, и быта народов. Процесс

глобализации облегчает доступ всего человечества к новым изобретениям, технологиям, знаниям, снимает запреты и ограничения для развития и творчества, следовательно, глобализация носит системный характер, охватывает все сферы жизни общества.

В современном мире глобализация, охватив не только развитые страны, но и страны третьего мира, подняла миграцию на абсолютно новый уровень, сделав ее необходимой составляющей любого государства. В докладе ООН отмечается, что более половины всех мигрантов проживают в 10 странах мира. Среди них на первом месте США (45,8 миллионов), РФ на втором месте (11 миллионов), на третьем – Германия (9,8 миллионов). Появилось новое понятие «глобализация миграционных процессов». Под этим явлением, как правило, понимается «увеличение масштабов международной миграции населения, вовлечение все большего числа стран мира в миграционное взаимодействие, качественное изменение структуры миграционных потоков в соответствии с потребностями глобализирующегося рынка труда» (3).

Проблемы международной миграции остаются в числе приоритетных вопросов повестки дня ООН, организация занимается различными аспектами международной миграции. В частности, входящая в ее состав Международная организация по миграции совместно со своими партнерами в международном сообществе в рамках содействия правительствам и гражданскому обществу многих государств. Миграция является довольно сложным и противоречивым процессом. Имея ряд плюсов и позитивных результатов для развития принимающих и отправляющих стран, она ведёт и к негативным последствиям. Чем больше население страны вовлечено в миграционные процессы, тем острее проявляются его последствия. Так, например, миграция способствует повышению материального благосостояния семей, но в то же время сохранение семьи и воспитание детей затрудняется отсутствием одного или обоих родителей (4). Помимо политических, демографических и экономических последствий, широкомасштабная миграция может иметь и санитарно-эпидемиологические последствия. Очевидные риски данного сценария связаны с ростом социальной напряженности на почве ксенофобии и межэтнических конфликтов в результате официального увеличения иммиграции.

II.Литературный обзор

Термин «миграция» имеет латинские корни (migratio) и означает перемещение, переселение. Однако понятия «перемещение» и «переселение» не являются идентичными и имеют разный смысл. Следует отметить, что и в научной среде нет единого взгляда на содержание данного понятия. Еще в 1987 г. Л. Л. Рыбаковский обращал внимание, что «в демографической науке, как, впрочем, и в других науках, изучающих миграцию, ни одно понятие не имеет столько различных трактовок, как миграция». В. А. Ионцев отмечал 36 определений потятия «миграция населения» в отечественной и 27 определениях — в зарубежной литературе.

Встречающиеся в научно-исследовательской литературе определения миграции населения А. У. Хомра попытался объединить в три группы:

а) самое широкое — тождественно понятию «подвижность»; при этом подходе миграция населения — это отраслевое, территориальное, профессиональное и социальное перераспределение;

б)широкое, представляющее миграцию как совокупность механических, профессиональных и отраслевых перемещений;

в) определение, в котором под миграцией населения понимается любое пространственное перемещение.

Согласно классификации Л. Л. Рыбаковского, все определения миграции населения разделены на четыре группы. В основу его классификации положен сущностный момент.

Первая группа определений смешивает два таких различных явления, как миграционный процесс и миграционный результат. Например, Н. Н. Филиппов и В. А. Суков понимают миграцию населения как «его перемещение по территории страны, в более широком смысле слова она представляет отраслевое, территориальное, профессиональное и социальное перераспределение».

Ко второй группе относятся определения, не разделяющие такие разные понятия, как «перемещение» и «мобильность». Так, Л. Л. Шамилева определяет миграцию как форму мобильности населения. Л. Л. Рыбаковский подчеркивает, что под миграцией населения следует понимать территориальное перемещение, а под мобильностью — способность к миграции, т. е. потенциальную миграционную активность.

В третьей группе определений миграции происходит смешение различных видов движения, в частности миграционного и социального. Например, М. В. Курман считает, что территориальная миграция не исчерпывает всего разнообразия видов миграции населения; в содержание данного термина включает производственную миграцию (внутри- и межотраслевую), а также образовательную и профессиональную миграцию (характеризующую переход из одной образовательной или профессиональной группы в другую) и выводит обобщающее все формы миграции понятие «социальная миграция».

Четвертая, наиболее распространенная и признаваемая большинством исследователей, группа определений относит к миграции только территориальные перемещения населения. Кроме того, следует иметь в виду, что и территориальные передвижения могут быть меж- и внутрипоселенными, при этом только первые из них можно отнести к миграциям. Территориальные перемещения весьма разнообразны и различаются в зависимости от расстояния передвижения, статуса объектов, между которыми происходит перемещения, сроков и целей перемещения. Даже подразумевая под миграцией территориальные передвижения населения, в термин «миграция населения» различные исследователи вкладывают самый разнообразный смысл. Не случайно и в отечественной, и в

зарубежной литературе появилось множество «прилагательных», конкретизирующих это понятие: сезонная, маятниковая, безвозвратная, временная, челночная, постоянная, экономическая, вынужденная, добровольная, экологическая, трудовая, городская, сельская, внешняя, международная, внутренняя и т. д.

Л. Л. Рыбаковский выделяет три возможных подхода к включению в миграцию различных видов территориального движения населения.

Во-первых, под миграцией понимается все многообразие пространственного движения населения, независимо от его характера и целей.

Во-вторых, в миграцию включают пространственное перемещение между населенными пунктами, которое ведет к постоянной или временной смене места жительства, а также представляет собой регулярное двустороннее движение между местом жительства и сферой труда или учебы.

В-третьих, к миграции относят такой процесс пространственного движения населения, который в конечном счете ведет к его территориальному перераспределению.

Повышение интенсивности различных видов миграции — экономической, этнической, трудовой — характерная черта глобализации, а доля мигрантов в постоянном населении стран отражает степень включенности в глобализационные процессы. Вместе с тем миграционные процессы имеют как преимущества, так и недостатки, становясь, таким образом, источником противоречий и конфликтов. Так, иммиграционные потоки в развитые страны уменьшают долю титульных наций, так как иммигранты, как правило, имеют более высокий уровень рождаемости. Например, в Германии, в Италии и др.

Быстрый рост населения в развивающихся странах вызвал избыток рабочей силы там, а развитие образования привело к тому, что растущая часть молодежи вполне способна адаптироваться к требованиям рынка труда развитых стран.

Огромные масштабы приобрела нелегальная иммиграция. Речь идет о дешевой и абсолютно бесправной рабочей силе, значительную часть которой составляют женщины. Нелегальные перемещения приводят к массовой маргинализации мигрантов и криминализации всей сферы миграционных отношений. Наглядным примером этого явления является наша страна.

Переселение народов по давно устоявшимся и новым направлениям сопровождается некоторыми особыми явлениями, связанными со столкновением и диффузией разных культур, религиозных и национальных традиций, которые, и чем дальше, тем больше, будут оказывать дестабилизирующее воздействие прежде всего на страны-реципиенты. Интенсивно расширяются явления усыновления детей, рожденных в иных странах и культурах. Как видим, миграционные процессы воздействуют на генофонд наций стран-реципиентов и стран-доноров.

Миграция активизирует мировой рынок высококвалифицированной рабочей силы. Такое явление наблюдается в США, в Канаде. Напротив,

движение неквалифицированных работников ограничено национальными барьерами, которые постоянно возрастают.

Устойчивая трудовая миграция за несколько десятилетий привела к сегментации рынков труда в развитых странах и выделению секторов, занятых преимущественно мигрантами. Это в первую очередь непрестижные рабочие места, не требующие высокой квалификации, с тяжелыми условиями и низкой оплатой, это наиболее дискриминируемые, неформальные или теневые сегменты занятости. Так, по оценкам социологов, численность неформально занятых в России составляет 25 млн человек (более 30% экономически активного населения) (6).

Все чаще возникают конфликты территориального характера. По подсчетам UNFPA (Фонд ООН в области народонаселения), спасаясь от преследований, вооруженных конфликтов и насилия, покинули свои страны около 13 млн. беженцев. Значительное число людей вынуждены уезжать по социальным и экологическим причинам.

Усиление миграционной активности вызывает обострение межнациональных проблем. Происходит столкновение различных культур, ценностей, конфессий, что может привести к серьезным последствиям, таким как межнациональный конфликт, война.

В условиях глобализации выявилось ещё одно свойство внешней миграции: международные миграционные потоки в настоящее время продолжают формироваться преимущественного за счёт населения развивающихся стран, основным мотивом перемещения которого является стремление обеспечить себе и своим близким более высокий уровень жизни, который в ведущих странах мира в десятки раз выше, чем в других странах. Иммигранты всё чаще не только уклоняются от возвращения на родину, но и добиваются переселения к себе близких родственников (1).

III.Заключение

Таким образом, глобализация миграционных процессов – это, прежде всего, объективное усиление проницаемости межгосударственных перегородок и резкое возрастание скорости и интенсивности трансгосударственных, транснациональных перетоков человеческих ресурсов (6). Последствия миграции, как видим, проявляются в различных сферах и могут быть как положительными, так и отрицательными. В этой связи одной из основных задач, стоящих перед странами, в эпоху глобализации, является разработка эффективной миграционной политики, четко регулирующей миграционные процессы, чтобы обеспечить бесконфликтное и благополучное развитие стран, их дальнейшей экономическое, политическое, культурное и социальное процветание.

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САМАРҚАНД ВИЛОЯТИДА ЮҚУМЛИ КАСАЛЛИКЛАР ҲОЛАТИНИ ЭПИДЕМИОЛОГИК БАҲОЛАШ

Аннотация. *Сўнгги йилларда инфекцияни ўрганиш муаммоларига эътибор сезиларли даражада ошди, чунки инфекция инсоннинг ташқи муҳит билан алоқасини воситачилик қилувчи ва катталар ҳамда болалар саломатлигини белгиловчи энг муҳим омилдир (1). Инфекция масалаларининг долзарблиги ҳар йили ошиб бормоқда. Сўнгги йилларда Самарқанд вилоятида 1 000 000 аҳолига тўғри келадиган инфекциянинг тарқалиши 882,4 интенсив кўрсаткични ташкил этди.*

Калит сўзлар. *ЎРВИ, инфекция, эпидемия, гепатит А, гепатит В, гепатит С.*

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EPIDEMIOLOGICAL ASSESSMENT OF THE STATE OF INFECTIOUS DISEASES IN THE SAMARKAND REGION

Abstract. *In recent years, attention has significantly increased to the problems of studying infection as the most important factor mediating the relationship between a person and the external environment and determining the health of adults and children (1). The relevance of infection issues is increasing every year. In recent years, the prevalence of infection in the Samarkand region per 1,000,000 population was an intensive indicator of 882.4.*

Keywords. *ARVI, infection, epidemic, hepatitis A, hepatitis B, hepatitis C.*

Мавзунинг долзарблиги. Кейинги йилларда юқумли инфекциясини ўрганиш мухим ахамиятга эга, айниқса унинг долзарблиги юқумли касалликлар сони йилдан йилга ошмоқда.Ушбу касалликнинг этиологик сабаблари турлича булиб ахоли орасида кўплаб кузатилмокда.Юқумли касалликлар Самаркад вилоятида таркалиши хар 100000 ахоли сонига нисбатан 2023 йилда 989,1 ни ташкил этган булса, 2024 йилга келиб 882,4 ни курсатиб, 10% га камайганлигини курсатмокда.

Тадқиқотнинг мақсади: Вилоят ахолиси орасида юқумли касалликларни холатини эпидемик бахолашдан иборатдир.

Материал ва услублар. Вилоят ахолисини инфекцияси билан хисобга олинишини Вилоят санитария-эпидемиологик осайшталик ва жамоат саломатлигини саклаш (ВСЭО ва ЖС) бошкармасининг статистик маълумотлари асосида ўрганилди (2023-2024 йиллар).

Тадқиқот натижалари. Вилоятда 2023 йилда ўтган 12 ойига нисбатан 2024 йилнинг шу даврига нисбатан рўйхатга олинган 40 турдаги юқумли касалликлардан 10 та тури (25%) (қорин тиф ва паратифлар, кўк йўтал,бўғма, шол, менингит, қизамиқ, қизилча,педикулёз касалликлари) қайд этилмади, 21 та тури (52,5%), (сальманеллёз, ЎВЮК, скарлатина, жами вирусли гепатитлар, вирусли гепатитнинг А тури, вирусли гепатит В, сурункали гепатитлар, ЎРВИ, захм, қора оқсок, сил касаллиги, тениаринхоз, энтеробиоз, лейшманиоз) 2024 йилнинг шу даврига нисбатан кўпайиши кузатилди, 9та тури (22,5%) (бактериал дизентерия, тепки, грипп, туберкулез, сузак, қўтир, эхинококкоз,тениаринхоз, энтеробиоз, аскаридоз, геминолепидоз, COVID-19 ва шифохона ички инфекцияси) нинг эса камайиш ҳолати кўзатилди.

2023 йилда жами руйхатга олинган юқумли касалликларнинг сони 41250 тани ташкил этса,2024 йилга келиб 372104 тани ташкил этди. Бу эса утган йилга нисбатан 10 фоизга камайганлигини курсатади Бу куйидаги жадвалда курсатилган.

Самарканд вилоятида 2023/2024 - йиллардаги юқумли касалликлар ҳақида маълумот

Ахоли сони 4170062 / 4216220

№	Инфекция тури	Абсолют сони		Интенсив курсатгич, 100 минг ахолига	
		2023	2024	2023	2024
1	Ичтерлама "Брюшной тиф"	-	-	-	-
2	Паратифлар А,В,С	-	-	-	-
3	Бошка сальм-з	5	4	0,12	0,09
3	УИИ жами	8 487	7 298		173,09
4	Куйдурги	-	-	-	-
5	Кора оксок «бруцеллез»	124	95	2,97	2,25
8	Кўкютал «коклюш»	-	-	-	-
9	Дифтирия	-	-	-	-
10	Полиомиелит	-	-	-	-
11	Менингит	-	-	-	-
12	ОИТС (ВИЧ)	383	362	9,18	8,59
13	Сувчечак «ветряная оспа»	161	58	3,86	1,38
14	Кизамик «Корь»		1 851	-	
15	Скарлатина	67	33	1,61	43,90
16	Кизилча "Краснуха"	1	-	0,02	0,78
16	Вирусли гепатит	10 231	8 888		210,80
17	Геп вирусни таш жами	110	75	2,64	1,78
18	Сурункали геп	125	63	3,00	1,49
19	Қутуриш «Бешенство»	1	2	0,02	0,05
20	Эпид. паротит	-	-	-	-
21	Малярия	-	-	-	-
22	УРВИ	7 858	5 955		141,24
23	Грипп	-	-	-	-
24	Туберкулез органов дых	1 046	1 028	25,08	24,38
25	Захм	284	296	6,81	7,02
26	Сузак	87	100	2,09	2,37
27	Кутир	172	217	4,12	5,15
28	Педикулез	7	4	0,17	0,09
29	Эхинококкоз	15	20	0,36	0,47
30	Тениаринхоз	8	12	0,19	0,28
31	Трихофития	305	285	7,31	6,76
35	Энтробиоз	10 100	9 033		214,24
36	Аскардиоз	1	-	0,02	-
37	Лейшманиоз	17	19	0,41	0,45
38	Гименолипедоз	1 392	1 400	33,38	33,21
39	Шифохона ички инфекцияси	67	69	1,61	1,64
40	COVID-19	196	37	4,70	0,88
	ЖАМИ :	41 250	37 204		882,40

Юқумли касалликлари 2023 йилнинг 12 ойида ўтган йилнинг шу даврига нисбатан (41250-37304) 3946 тага камайиб, ҳар 100 минг аҳолига нисбатан интенсив кўрсатгич 882.4 ни ташкил этди.

Хулоса.

1.Юқумли касалликларни 2024 йилда 2023 йилга нисбаттан 10 фоизга камайган.Бу эса юқумли касалликларга карши прафилактик комплекс чора-тадбирлар режаси ижроси жойларда яхши таминланганлигини курсатади.

2. Вилоятда руйхатга олинган юқумли касалликларни 10 тури (25%) кайд этилмаган,21 тури (52,5%) купайган ва 9 тури (22,5%)да камайганлиги кузатилган.

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РАЗВИТИЕ КОНЦЕПЦИИ ЛАНДШАФТА И СОВРЕМЕННОЕ ЛАНДШАФТОВЕДЕНИЕ

Annotatsiya: *В данной статье анализируется развитие и современное состояние концепции ландшафта, которая является одной из важнейших проблем географических исследований. В статье освещается возникновение термина "ландшафт," его превращение в научное понятие и сущность предмета ландшафтоведения, который сегодня является одной из дисциплин, имеющих важное научное и практическое значение во всех странах мира.*

Ключевые слова: *ландшафт, геосистема, природный территориальный комплекс, антропогенный ландшафт, культурный ландшафт, ландшафтная сфера, ландшафтоведение.*

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DEVELOPMENT OF THE LANDSCAPE CONCEPT AND MODERN LANDSCAPE SCIENCE

Annotation: *This article analyzes the development and current state of the landscape concept, which is one of the most important problems of geographical research. The article covers the emergence of the term "landscape," its transformation into a scientific concept, and the essence of the subject of landscape science, which today is one of the disciplines that has important scientific and practical significance in all countries of the world.*

Keywords: *landscape, geosystem, natural territorial complex, anthropogenic landscape, cultural landscape, landscape sphere, landscape science.*

Основное понятие, объединяющее теории, законы, модели, гипотезы, обобщения и мнения, возникшие в результате научных исследований, называется концепцией.

В настоящее время нельзя сказать, что человек, не интересующийся естественными науками, обладает широким кругозором. Чтобы иметь широкий кругозор, нужно иметь представление о естественных науках. Одним из таких понятий является международно признанный научный термин "Ландшафт." В развитии географии концепция ландшафта (геосистема, природно-территориальный комплекс, геокомплекс) является одним из важнейших теоретических положений.

Слово "ландшафт" впервые встречается в трудах монахов Фульдского монастыря в IX веке. При переводе с латыни "Библейской гармонии" теолог Татиан заменил латинское слово регион словом ландшафт. Позже это понятие постепенно стало (возродилось) понятием, далеким от своего первоначального значения. Ландшафт стал административно-территориальным и территориальным понятием [1]. В XVI веке начинает развиваться ландшафтная живопись. На рисунках изображены типичные виды земель. К началу XIX века под ландшафтом понималась окружающая территория, видимая наблюдателю с первого взгляда и отличающаяся от соседних земель.

Немецкое слово Landschaft использовалось художниками с XV века для обозначения какого-либо аспекта облика земной поверхности - природного пейзажа[3].

В настоящее время термин "ландшафт" в научном содержании заимствован из немецкого разговорного языка (die Landschaft; land земля, территория, край, место schaft взаимосвязь). Термин ландшафт был введен в научную географическую литературу в 1805 году немецким географом А. Гоммеером с четко определенным значением. В 1885 году И. Виммер в своей книге "Historische Landschaftskunde" высказал идею о том, что география должна ориентировать взаимодействие объектов и явлений на определенных территориях на ландшафтообразующий комплекс. Современное ландшафтоведение было основано в середине XIX века немецкими учеными А. Гумбольдтом и К. Риттером. А. Гумбольдт в своих исследованиях также использовал слово "Ландшафт." Но под ландшафтом он понимал красоту окружающей среды, воспринимаемую глазами (визуально) и оцениваемую эстетически. Поэтому А. Гумбольдта можно считать основателем художественного ландшафтоведения[4].

В конце XIX века в Германии и ряде других стран ландшафт стал рассматриваться как объект изучения географии. Эта идея, которая позже интерпретировала географию как ландшафтоведение, была развита О. Шлюттером (Schlüter, 1906), учеником Ф.Ф. Рихтгофена. О. Шлюттер считал, что главной задачей географии является изучение изменений ландшафта от "дикого" до культурного состояния.

После О. Шлюттера многие немецкие географы, уделяя большое внимание понятию "ландшафт," определяют географию как ландшафтоведение. Л. Вайбель (1933) в своей статье, посвященной сущности термина "ландшафт," пишет, что в Германии этот термин начал широко использоваться в то время, когда географы сосредоточились на изучении более мелких территорий.

Одним из ученых, внесших большой вклад в развитие географии как ландшафтоведения (Landschaftskunde) в Германии, является З. Пассарге (1867-1958). Он исследовал ландшафты не только в процессе изучения небольших территорий (районов), но и на основе выводов глобального масштаба. По его мнению, главная задача географа - изучение природных ландшафтов. В своих книгах "Основы ландшафтоведения" (1920), "Описание ландшафта" (1929), "Проблемы культурно-географических местностей" (1933) он также изложил вопросы, связанные с изучением ландшафтов[2].

На ранних этапах становления ландшафтоведения значительный вклад внесли ученые Западной Европы и Америки. Научное представление о ландшафте в разных странах формировалось рядом ученых, таких как А. Гумбольдт, К. Риттер, Г.Н. Высоцкий, Г.Ф. Морозов, Л.С. Берг, А.А. Борзов, Р.И. Аболин, З. Пассарге, О. Шлюттер. В целом, концепция ландшафта является продуктом и достижением немецких и русских географических идей.

В начале XX века идея А.Н. Краснова о природных (географических) комплексах воплотилась в понятии "ландшафт," широко используемом в настоящее время в физической географии, и позволила ландшафтоведению сформироваться как самостоятельной науке. На основе учения о природных территориальных комплексах сформировалось новое направление - ландшафтоведение. Ландшафт - однородный участок географической оболочки, характеризующийся закономерным сочетанием природных компонентов и характером взаимосвязей между ними. Ландшафт состоит не только из природных комплексов, но и мелких природных территориальных комплексов (фации, урочища, местности и др.).

Особенно велики заслуги в становлении ландшафтоведения и разработке учения о ландшафте российского ученого Л.С.Берга (МГУ, ученик Анучина). Благодаря его исследованиям сформировалось представление о целостной территориальной единице ландшафта в системе географических комплексов, обладающей основным и определенным ограниченным объемом и содержанием [5].

В мировой литературе существуют различные трактовки понятия ландшафта. В некоторых подходах ландшафт приравнивается к окружающей среде (географическим условиям). Другой подход вытекает из культурологических особенностей ландшафта. В нашей географической литературе ландшафт рассматривается как естественная система [8].

В современной географической литературе понятие "ландшафт" трактуется в основном тремя способами:

1) в региональной интерпретации ландшафт - (первоначально в работах Л.С. Берга ландшафт интерпретируется в региональном контексте А.А. Григорьевым, С.В. Калесником, А.Г. Исаченко, Н.А. Солнцевым, К.И. Геренчуком, Н.И. Михайловым, А. Саидовым, Ю. Султановым, Л. Алибековым, Т. Жумабоевым, А. Рахматуллаевым и многими другими учеными. По их мнению, ландшафт - это конкретное, территориально ограниченное место на поверхности Земли. А.А. Григорьев, В.М. Четыркин, А.Г. Исаченко и ряд других ученых считают ландшафт синонимом географического района) - это конкретная территория с единым геологическим фундаментом, одинаковым типом рельефа, общим климатом, гидротермическими условиями, одинаковым сочетанием почв, биоценозов и, следовательно, одинаковым уровнем сложения и природными границами простых комплексов (фаций, урочищ).

2) в типологической интерпретации - (Л.С.Берг, Б.Б.Полинов, И.М.Крашенников, С.С.Неуструев, Н.А.Гвоздецкий, Э.М.Мурзаев, Н.Бабушкин, Н.А.Когай, В.М.Чупахин, А.Ю.Федина, М.У.Умаров, П. Баратов, Ш.С. Зокиров и ряд других ученых) учитывается представление об относительной однородности ландшафта, т.е. ландшафт рассматривается как совокупность природных компонентов и его распространение не зависит от территории. В этой интерпретации ландшафты не считаются региональными единицами, то есть единицами физико-географического районирования.

Понятие "ландшафт" в типологической интерпретации близко к понятию "почвы." Например, пустынные ландшафты, степные ландшафты и др.

3) ландшафт в общем понимании является синонимом региональных и типологических комплексов любого размера. При этом понятие ландшафта можно сравнить с такими общими понятиями, как климат, почва, рельеф. По мнению Ф.Н. Милькова, "ландшафт - это совокупность предметов и явлений, находящихся во взаимной обусловленности и взаимозависимости, проявляющихся в виде исторически сложившихся, непрерывно развивающихся географических комплексов" [4]. В общей интерпретации термин "ландшафт" используется в единственном числе. Например, "Ландшафт бассейна Кашкадарьи," "пустынный ландшафт" и др.

Вопрос о месте ландшафтоведения в системе наук сам по себе остается нерешенным: ряд ученых (Ш.С. Закиров, Х.Р. Тошов 2016) считают, что место ландшафтоведения должно быть не в ряду физической географии, а в ряду Общего знания о Земле и региональной физической географии, которые являются ее частями, ландшафтоведение изучает не все объективно существующие на поверхности Земли физико-географические комплексы, а только локальные. - Некоторые ученые (Абдулкасимов А.А., 2011; Абдуллаев С.И., 2015;) ландшафтоведение относится к физико-географическим наукам и составляет их ядро и связывает их. Они считают, что задача ландшафтоведения заключается в всестороннем изучении региональных и локальных геосистем, то есть дифференциации и интеграции, развития и

размещения природных территориальных комплексов, их различных свойств, существования, динамики и закономерностей эволюции.

Для всех типов интерпретаций ландшафта это понимание его как природных территориальных комплексов. Разница заключается в том, в каком типе и таксономической величине рассматривается понятие ландшафта. Все три интерпретации понятия "ландшафт" можно рассматривать как теоретическую модель природной среды. Каждое из направлений в определенной степени служит практике. В связи с широким применением системного подхода в географических исследованиях ландшафт (природно-территориальный комплекс) стал рассматриваться как геосистемы регионального и местного масштаба.

Как отмечалось выше, современные ландшафты, распространенные практически на всех больших и малых территориях нашей планеты, были изменены в определенной степени прямо или косвенно в результате деятельности человека. Поэтому современные ландшафты в основном состоят из территориального сочетания антропогенных ландшафтов с более или менее измененными природными ландшафтами. В целом, можно считать, что на Земле практически не сохранилось природных ландшафтов, которые не были изменены в той или иной степени. Это связано с тем, что непрерывное круговое движение вещества и энергии в географической оболочке проявляется как в ландшафтных компонентах Антарктиды и Антарктики, не подверженных воздействию деятельности человека, так и в высокогорных районах.

Поэтому концепция ландшафта (геосистемы) за последние 40-50 лет значительно изменилась. Потому что долгое время ландшафт представлялся как замкнутая саморегулирующаяся система. В настоящее время ландшафт рассматривается как открытая динамическая пространственно-временная система, "система взаимодействия человека и природы. Как отмечает Т.Д.Александрова, "исследование различных типов антропогенных ландшафтов как особой категории природных образований, сопровождающих деятельность человека, стало одной из наиболее актуальных проблем современного ландшафтоведения" [9]

Ландшафт - это не только объект научного исследования, но и объект человеческой деятельности. Ландшафт - это геосистема, существующая на основе естественных законов, саморегулирующаяся, восстанавливающаяся, потребляющая, генерирующая, накапливающая и территориально воспроизводящая материальные и нематериальные ресурсы.

В настоящее время в рамках ландшафтоведения большое значение имеет изучение морфологии ландшафта (при исследовании конкретного ландшафта, его выявлении в полевых условиях и картографировании, изучение и знание его морфологического строения. Одной из важнейших теоретических частей ландшафтоведения является учение о морфологическом строении ландшафтов.), геотопология, ландшафтная геохимия,

антропогенное ландшафтоведение, прикладное ландшафтоведение и другие направления.

Современное ландшафтоведение активно занимается разработкой научных основ оптимизации взаимодействия человека с природой, принципов и методов создания культурных ландшафтов. Знание ландшафтов должно быть основой сотрудничества человека и природы. Ландшафтоведение имеет важное мировоззренческое значение, оно пронизано идеями гуманизации, экологизации, конструктивности.

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ПОРТО-КОВАЛЬНЫЕ АНАСТОМОЗЫ ТОЛСТОЙ КИШКИ И КОЛЛАТЕРАЛЬНОЕ КРОВООБРАЩЕНИЕ

Резюме: *В статье изучены порто-ковальные анастомозы толстой кишки и коллатеральное кровообращение. В этих опытах отток венозной крови затруднялся на большом протяжении на уровне девяти прямых венозных ветвей от нисходящей ободочной кишки. Одновременная перевязка указанных артерий и вен позволила установить в первые дни лишь некоторую отечность всех слоев кишечной стенки и умеренное венозное полнокровие слизистого и подслизистого слоев. Предварительно на прямой кишке выключался комплекс упомянутых артерий, участвующих в питании этого органа.*

Ключевые слова: *эксперименте, собаки, средняя ободочная артерия, левая ободочная артерия, прямые артерии, дуге Риолана, порто-кавальные анастомозы.*

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PORTO-COVAL ANASTOMOSIS OF THE LARGE INTESTINE AND COLLATERAL CIRCULATION

Abstract: *The article studies porto-coval anastomoses of the large intestine and collateral circulation. In these experiments, the outflow of venous blood was hampered over a large area at the level of nine direct venous branches from the descending colon. Simultaneous ligation of the indicated arteries and veins allowed us to establish in the first days only some edema of all layers of the intestinal wall and moderate venous plethora of the mucous and submucous layers. The complex of the mentioned arteries participating in the nutrition of this organ was previously switched off on the rectum.*

Key words: *experiment, dogs, middle colic artery, left colic artery, straight arteries, Riolan's arc, portocaval anastomoses.*

Ввдение. В этой связи морфологические исследования отдельных органов и систем в эксперименте представляют большое теоретическое и

практическое значение [1,6]. Нормальная работа кишечника возможна при условии его оптимального кровоснабжения [2]. Между аппаратом пищеварения и сердечно-сосудистой системой существует тесная структурно - функциональная зависимость, необходимая для отправления специализированной функции кишечника [3]. Кровеносная система обеспечивает необходимый уровень обменных процессов, а также осуществляет транскапиллярный обмен в стенке кишечника [4]. Поэтому нарушения кровообращения в стенке кишечника приводят к патологии клеточного и тканевого метаболизма, развитию различного вида повреждений в стенке кишечника [5,7].

Цель исследования. Нами были изучено порто-ковальные анастомозы толстой кишки и коллатеральное кровообращение в эксперименте.

Материалы и методы исследования. В исследованиях перевязывались на собаках средняя ободочная, левая ободочная и 2 прямые артерии на дуге Риолана. Ишемия кишечной стенки в этих условиях приводила к некрозу всех слоев кишечной стенки й гибели животного от перитонита.

Результаты исследования. Однако, если к упомянутому комплексу артерий добавлялось лигирование средней ободочной и задней брыжеечной вен вблизи слияния её с передней брыжеечной веной, то мы не получили ожидаемых благоприятных результатов, т. к. 1/3 животных погибала от перитонита, а у выживших животных в дальнейшем наблюдались функциональные и морфологические изменения со стороны толстой кишки. Таким образом, это неполное затруднение оттока венозной крови лишь несколько улучшило исходы операции, но не предотвратило возможности возникновения гангрены, т. е. экспериментально не было доказательств редуцированного кровообращения. Можно предположить, что приток крови по артериальным коллатералям был несколько меньше оттока венозной крови, т. к. сохранялся окольный путь оттока венозной крови по порто-ковальным анастомозам в области прямой кишки в венозную систему задней полой вены.

В дальнейшем для того, чтобы отток венозной крови привести в большее соответствие с перевязанными артериями, особенно, на задней брыжеечной артерии, дополнительно перевязать русло каудальной брыжеечной вены непосредственно у начала прямой кишки. В этих опытах отток венозной крови затруднялся на большом протяжении (на уровне девяти прямых венозных ветвей от нисходящей ободочной кишки) и, естественно, произошло большое разобщение задней брыжеечной вены с системой задней полой вены. Результаты экспериментов стали значительно лучше в том отношении, что после перевязки тех же артерий (средней ободочной, задней брыжеечной артерии с левой ободочной и с двумя прямыми артериями на дуге Риолана) в сочетании с венами (средней ободочной и задней брыжеечной вены в двух местах - у прямой кишки и в месте слияния с передней брыжеечной веной) уже не было смертельных исходов. Все 15 собак этого опыта перенесли операцию и жили продолжительное время (от 120 до 300 дней) без каких-либо нарушений со стороны толстой кишки. На вскрытии не обнаруживались

никакие изменения. Одновременная перевязка указанных артерий и вен позволила установить в первые дни лишь некоторую отечность всех слоев кишечной стенки и умеренное венозное полнокровие слизистого и подслизистого слоев. В базальных отделах слизистой оболочки выявлялась выраженная инфильтрация. Для выявления ишемического состояния, некроза и перитонита в районе прямой кишки и прилежащем участке нисходящей ободочной кишки. К ним относятся система задней брыжеечной артерии (левая ободочная и краниальная прямокишечная вместе с дополнительной семикратной перевязкой краевого сосуда в промежутках между прямыми сосудами, отходящими от левой ободочной и краниальной прямокишечной артерий). В условиях такого выключения артериального русла удалось вызвать некроз на кишечной стенке и гибель животных от перитонита через 2-3 дня.

Предварительно на прямой кишке выключался комплекс упомянутых артерий, участвующих в питании этого органа. Когда же одновременно выключались в одном комплексе и перечисленные артерии прямой кишки, и задняя брыжеечная вена вместе с двумя внутренними подвздошными венами, но мы не наблюдали особых функциональных изменений в последующий период жизни животного. Это и есть наилучший способ экспериментального редуцированного кровообращения. Неоднократные преднамеренные вскрытия показали, что никаких макроскопических изменений в операционном поле прямой кишки не отмечено. Сравнивая перевязку венозного русла в опытах на смежных отделах толстой кишки - нисходящий отдел ободочной и прямой кишки, мы отмечаем их сходство в том, что перевязывались главные венозные русла, охватывающие проксимально и дистально операционное поле, перевязанных артериальных сосудов. В экспериментах на прямой кишке для получения эффекта редуцированного кровообращения перевязывались задняя брыжеечная вена, как ветвь воротной вены и две внутренние под: поздошные вены, как ветви задней полой вены. Только учитывая упомянутые закономерности, можно получить необходимое равновесие притока и оттока в нижнем отделе толстой кишки.

Вывод. Эксперименты с перевязкой задней брыжеечной вены и передней брыжеечной вены значительно отличаются, т. к. отток в последней вене направлен в воротную вену, собирающую кровь из тонкой кишки, а в заднюю брыжеечную вену венозная кровь собирается от толстой кишки, и ее отток может совершаться в заднюю полую вену животного и в воротную вену. В отличие от тонких кишок, где можно перевязывать только одноименные вены кишечным артериям для сохранения жизни животного, на ободочной же кишке возможно наряду с венами мелкого калибра выключать вены крупного диаметра, к которым относится задняя брыжеечная вена, которая выключалась в двух местах, а также внутренние подвздошные вены, относящиеся к задней полой вене.

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ОСОБЕННОСТИ РАСПРОСТРАНЕНИЯ И РАЗВИТИЯ ЭХИНОКОККА

Аннотация. *Эхинококкоз — это опасное паразитарное заболевание, вызываемое личиночной стадией ленточного червя Echinococcus. В статье рассматриваются особенности географического распространения эхинококка, факторы, способствующие его эпидемиологической устойчивости, а также механизмы развития заболевания в организме человека. Особое внимание уделяется циклу передачи паразита, роли промежуточных и окончательных хозяев, а также влиянию санитарно-гигиенических условий и особенностей животноводства на распространение эхинококкоза. Представлены современные данные по патогенезу, клиническим проявлениям и возможностям профилактики заболевания.*

Ключевые слова: *эхинококкоз, паразит, ленточный червь, промежуточный хозяин, эпидемиология, патогенез, санитария, зоонозные инфекции*

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FEATURES OF THE SPREAD AND DEVELOPMENT OF ECHINOCOCCUS

Abstract. *Echinococcosis is a dangerous parasitic disease caused by the larval stage of the tapeworm Echinococcus. The article discusses the features of the geographic distribution of echinococcus, factors contributing to its epidemiological resistance, as well as the mechanisms of disease development in the human body. Particular attention is paid to the transmission cycle of the parasite, the role of intermediate and final hosts, as well as the influence of sanitary and hygienic conditions and animal husbandry characteristics on the spread of echinococcosis. Modern data on the pathogenesis, clinical manifestations and prevention options for the disease are presented.*

Keywords: *echinococcosis, parasite, tapeworm, intermediate host, epidemiology, pathogenesis, sanitation, zoonotic infections*

Введение

Эхинококкоз является одним из наиболее актуальных зоонозных паразитарных заболеваний, представляющих серьёзную угрозу как для

здоровья человека, так и для животноводства. Возбудителем болезни является личиночная стадия ленточного гельминта рода *Echinococcus*, основными носителями которого выступают плотоядные животные, а промежуточными хозяевами — сельскохозяйственные и дикие млекопитающие, включая человека. Заболевание широко распространено в регионах с развитым животноводством, особенно в сельской местности, где тесный контакт между человеком и животными способствует передаче паразита.

На фоне глобализации, миграции населения и изменения экологических условий наблюдается рост числа случаев эхинококкоза в ранее неэндемичных районах. Это требует более глубокого изучения особенностей его распространения, а также разработки эффективных профилактических и диагностических мероприятий.

В данной статье рассматриваются эпидемиологические и биологические аспекты эхинококкоза, с акцентом на механизмы передачи и развития паразита, а также влияние экологических и антропогенных факторов на динамику заболевания.

Материалы и методы

Исследование проводилось на базе данных, собранных в эндемичных по эхинококкозу районах, включая сельскохозяйственные регионы с высокой плотностью поголовья домашних животных (овец, крупного рогатого скота, собак). В качестве материала использовались клинические данные пациентов с подтверждённым диагнозом эхинококкоза, а также данные ветеринарных и санитарно-эпидемиологических служб.

Применялись следующие методы:

Эпидемиологический анализ — для оценки уровня заболеваемости и выявления факторов риска.

Лабораторные методы — включая серологические тесты (ИФА) и ПЦР для диагностики эхинококкоза у человека и животных.

Ультразвуковое и рентгенологическое исследование — для визуализации эхинококковых кист в органах.

Анализ патологоанатомических данных — для изучения морфологии кист и стадий развития паразита.

Статистическая обработка данных — с использованием программных средств для выявления корреляций между эпидемиологическими показателями и экологическими факторами.

Полевые наблюдения сопровождались опросами местных жителей и фермеров для выявления путей передачи и санитарно-гигиенических условий, способствующих распространению заболевания.

Результаты и обсуждение

Результаты проведённого исследования подтвердили наличие устойчивой эпидемиологической ситуации по эхинококкозу в сельских районах с развитым животноводством. Выявлено, что наибольшая заболеваемость наблюдается среди населения, занимающегося разведением овец и крупного рогатого скота. Более 65% клинически подтверждённых

случаев эхинококкоза пришлись на лиц, имевших регулярный контакт с потенциально заражёнными животными и не соблюдавших элементарные санитарные меры.

Серологические и инструментальные методы диагностики (УЗИ, ИФА) показали высокую чувствительность и специфичность при выявлении эхинококковых кист на ранних стадиях заболевания. В большинстве случаев поражения были локализованы в печени (72%), реже — в лёгких и других органах.

Проведённый эпидемиологический анализ подтвердил связь между уровнем заболеваемости и недостаточной санитарной культурой, отсутствием регулярной дегельминтизации собак и свободным выпасом сельскохозяйственных животных. Также выявлена низкая осведомлённость населения о путях заражения эхинококком, что способствует его дальнейшему распространению.

Обсуждение результатов подчёркивает необходимость комплексного подхода к контролю эхинококкоза, включающего ветеринарные, медицинские и образовательные меры. Важным элементом профилактики является систематическая работа с населением по вопросам личной гигиены, обработки пищи, контроля над численностью бездомных животных и проведения регулярных ветеринарных осмотров.

Заключение

Эхинококкоз остаётся серьёзной медико-ветеринарной проблемой в регионах с развитым животноводством и недостаточным уровнем санитарной культуры. Результаты исследования показывают, что распространение заболевания во многом обусловлено тесным взаимодействием человека с животными, отсутствием должного ветеринарного контроля и низким уровнем информированности населения.

Для эффективного снижения уровня заболеваемости необходимо внедрение комплексных профилактических мероприятий, включающих регулярную дегельминтизацию домашних животных, санитарное просвещение населения, улучшение условий содержания скота и контроль за численностью бездомных животных. Кроме того, важно обеспечить доступность современных диагностических методов и усилить межсекторальное сотрудничество между медицинскими и ветеринарными службами.

Только системный подход и координация усилий на местном и государственном уровнях позволят эффективно контролировать распространение эхинококкоза и минимизировать его последствия для здоровья населения.

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СОВРЕМЕННЫЕ МЕТОДЫ ИЗУЧЕНИЯ ГЕНЕТИКИ ЧЕЛОВЕКА

Аннотация. *Современные достижения в области молекулярной биологии и биоинформатики открыли новые горизонты в изучении генетики человека. В данной статье рассматриваются наиболее актуальные методы исследования человеческого генома, включая секвенирование нового поколения (NGS), микрочиповые технологии, полимеразную цепную реакцию (ПЦР), CRISPR-Cas9 и биоинформационный анализ. Анализируются их преимущества, области применения и значение в диагностике наследственных заболеваний, персонализированной медицине и генной терапии.*

Ключевые слова: *генетика человека, секвенирование, CRISPR-Cas9, молекулярная диагностика, персонализированная медицина, мутации, геномика, биоинформатика*

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MODERN METHODS OF STUDYING HUMAN GENETICS

Abstract. *Modern advances in molecular biology and bioinformatics have opened up new horizons in the study of human genetics. This article reviews the most relevant methods for studying the human genome, including next-generation sequencing (NGS), microarray technologies, polymerase chain reaction (PCR), CRISPR-Cas9, and bioinformatics analysis. Their advantages, areas of application, and significance in the diagnosis of hereditary diseases, personalized medicine, and gene therapy are analyzed.*

Keywords: *human genetics, sequencing, CRISPR-Cas9, molecular diagnostics, personalized medicine, mutations, genomics, bioinformatics*

Введение

Генетика человека — это одна из наиболее динамично развивающихся областей современной биомедицины. Изучение наследственной информации позволяет не только понять природу различных заболеваний, но и разрабатывать эффективные стратегии их диагностики, лечения и профилактики. С начала расшифровки генома человека в 2003 году генетические технологии претерпели значительный прогресс: от простейших

методов цитогенетики до высокоточного секвенирования ДНК и редактирования генома.

Современные методы позволяют анализировать генетические вариации с высокой точностью и в кратчайшие сроки. Они используются как в фундаментальных исследованиях, так и в клинической практике — при выявлении наследственных заболеваний, определении предрасположенности к онкопатологиям и разработке таргетной терапии.

Настоящая работа посвящена анализу наиболее эффективных методов изучения генетики человека, их техническим особенностям и применимости в современной медицине.

Материалы и методы

В данной работе использован комплексный подход к анализу современных методов, применяемых для изучения генетики человека. Основу исследования составили как теоретические источники, так и практические наработки, отражающие передовой опыт генетических лабораторий. Материалом послужили научные статьи, опубликованные в международных базах данных за период 2014–2024 годов, включая публикации в журналах, индексируемых в Scopus и Web of Science, а также отчёты Всемирной организации здравоохранения и Национального института здоровья США.

В рамках теоретического анализа были рассмотрены методы секвенирования нового поколения, такие как Illumina и Oxford Nanopore, позволяющие определять полную нуклеотидную последовательность ДНК с высокой точностью. Также было уделено внимание ПЦР-диагностике, которая по-прежнему широко используется в клинической практике для амплификации специфических участков генома. Сравнительно оценены возможности микрочиповых технологий при массовом скрининге и диагностике распространённых мутаций.

Особое внимание в исследовании уделено технологии редактирования генома CRISPR-Cas9 как инновационному методу, открывающему перспективы в терапии наследственных заболеваний. Рассмотрены как лабораторные протоколы её применения, так и этические аспекты, связанные с вмешательством в человеческий геном.

Дополнительно в анализ были включены современные биоинформатические инструменты, обеспечивающие обработку, аннотирование и визуализацию больших объёмов генетических данных. Использование платформ Geneious, ClinVar, UCSC Genome Browser и других позволило оценить точность интерпретации мутаций и генетических вариаций.

Методологическая часть исследования также включала обзор клинических примеров применения данных методов при диагностике таких заболеваний, как муковисцидоз, наследственные формы рака, редкие митохондриальные синдромы. Таким образом, исследование проводилось на стыке молекулярной биологии, клинической генетики и биоинформатики, что

позволило всесторонне охарактеризовать возможности современных методов в изучении генетики человека.

Результаты и обсуждение

Анализ современных методов изучения генетики человека показал, что наиболее эффективные из них основаны на применении высокоточных молекулярно-биологических технологий. Секвенирование нового поколения (NGS) позволило значительно расширить представление о структуре и вариабельности человеческого генома. Благодаря высокой чувствительности и способности одновременно анализировать миллионы фрагментов ДНК, данный метод стал незаменимым в клинической генетике, особенно при диагностике редких наследственных заболеваний и злокачественных новообразований. Практика показала, что использование NGS-технологий позволяет не только идентифицировать мутации, но и прогнозировать течение заболевания, а также подбирать индивидуализированное лечение.

Полимеразная цепная реакция, несмотря на длительное использование, продолжает занимать важное место в молекулярной диагностике. Её доступность, быстрота и точность делают её удобной для выявления известных мутаций, а также для оценки экспрессии определённых генов, особенно в условиях ограниченных ресурсов.

Технологии микрочипов доказали свою эффективность при массовом генетическом скрининге, особенно в популяционных исследованиях. Благодаря возможности одномоментного анализа тысяч точек генома, микрочипы успешно используются в фармакогенетике, пренатальной диагностике и в программах по оценке генетической предрасположенности к заболеваниям.

Особое место в обсуждении занимает технология редактирования генома CRISPR-Cas9. Хотя её применение в клинической практике пока ограничено, результаты экспериментов демонстрируют высокую точность и эффективность модификации ДНК. На примере экспериментального лечения таких заболеваний, как серповидноклеточная анемия и наследственная амавротическая, можно отметить значительный прогресс в направлении генной терапии. Однако остаются нерешёнными вопросы безопасности, специфичности и биоэтики, связанные с редактированием генома человека.

Кроме того, важную роль в современном генетическом исследовании играет биоинформатика. Обработка и интерпретация огромного объёма данных, полученных в результате секвенирования и других методов, невозможны без мощных вычислительных платформ и алгоритмов. Применение биоинформатических программ позволяет не только систематизировать генетические вариации, но и строить прогностические модели развития заболеваний на основе индивидуального генома пациента.

В совокупности результаты исследования подтверждают, что интеграция передовых молекулярных методов с информационными технологиями обеспечивает качественно новый уровень диагностики и персонализированной медицины. Современные подходы в генетике человека

становятся неотъемлемой частью клинической практики и играют ключевую роль в развитии превентивной и таргетной терапии.

Заключение

Современные методы изучения генетики человека открывают широкие возможности в медицине и биотехнологии. Их применение способствует раннему выявлению наследственных заболеваний, созданию персонализированных схем лечения и развитию генной терапии. Однако наряду с техническими достижениями необходимо учитывать этические и правовые аспекты, особенно в области редактирования генома.

Будущее медицинской генетики связано с интеграцией молекулярных методов и искусственного интеллекта, что обеспечит прорыв в профилактике и лечении многих неизлечимых заболеваний.

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ЭКОЛОГИЧЕСКИЕ ПРОБЛЕМЫ, НАБЛЮДАЕМЫЕ НА ПЛАНЕТЕ И ИХ ДЕЙСТВИЯ НА ЖИЗНЕДЕЯТЕЛЬНОСТЬ ЧЕЛОВЕКА

Аннотация. *В настоящее время человечество сталкивается с множеством острых экологических проблем, таких как загрязнение атмосферы, водных ресурсов и почвы, изменение климата, вырубка лесов и утрата биологического разнообразия. Эти явления оказывают прямое и опосредованное влияние на здоровье, качество жизни и безопасность человека. В данной статье рассматриваются основные глобальные экологические угрозы, их причины и последствия, а также анализируются механизмы их воздействия на жизнедеятельность человека. Особое внимание уделяется необходимости устойчивого развития, международного сотрудничества и формирования экологической культуры среди населения.*

Ключевые слова: *экологические проблемы, загрязнение окружающей среды, изменение климата, здоровье человека, устойчивое развитие, биосфера, экологическая безопасность, воздействие на человека*

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ENVIRONMENTAL PROBLEMS OBSERVED ON THE PLANET AND THEIR EFFECTS ON HUMAN LIFE

Abstract. *Humanity currently faces many acute environmental problems, such as air, water and soil pollution, climate change, deforestation and loss of biodiversity. These phenomena have a direct and indirect impact on human health, quality of life and safety. This article examines the main global environmental threats, their causes and consequences, and analyzes the mechanisms of their impact on human life. Particular attention is paid to the need for sustainable development, international cooperation and the formation of environmental culture among the population.*

Keywords: *environmental problems, environmental pollution, climate change, human health, sustainable development, biosphere, environmental safety, impact on humans*

Введение

В XXI веке экологические проблемы приобрели глобальный масштаб и стали

одной из важнейших угроз для устойчивого развития человечества. Загрязнение воздуха и воды, разрушение экосистем, истощение природных ресурсов, изменение климата и сокращение биоразнообразия — все эти факторы непосредственно влияют на условия жизни человека, состояние здоровья и социально-экономическую стабильность обществ.

Рост индустриализации, урбанизация, нерациональное использование ресурсов и низкий уровень экологической ответственности в течение десятилетий привели к нарушению природного баланса на планете. В результате человечество сталкивается с новыми вызовами, включая увеличение числа заболеваний, связанных с экологией, ухудшение качества питьевой воды, почвенная деградация, природные катастрофы и изменение погодных условий.

Настоящая статья направлена на систематизацию и анализ актуальных экологических проблем, изучение их причин и последствий, а также оценку их воздействия на жизнедеятельность человека. Кроме того, рассматриваются возможные пути решения этих проблем и необходимость перехода к модели устойчивого развития.

Материалы и методы

Для проведения данного исследования был использован комплексный междисциплинарный подход, сочетающий методы анализа в области экологии, медицины, социологии и статистики. Основной целью было изучение взаимосвязи между экологическими проблемами и их воздействием на жизнедеятельность человека.

Теоретическая база исследования: были изучены научные труды отечественных и зарубежных исследователей по следующим направлениям:

Глобальные экологические угрозы и их эволюция за последние 50 лет;

Влияние загрязнения окружающей среды на здоровье человека;

Изменения климата и их последствия для демографической ситуации;

Концепция устойчивого развития и стратегии адаптации общества к экологическим изменениям.

Источники эмпирических данных. В качестве материала использовались:

Данные Всемирной организации здравоохранения (ВОЗ) по уровню заболеваемости, вызванной факторами окружающей среды (респираторные заболевания, онкология, сердечно-сосудистые болезни и др.);

Мониторинговые отчёты Программы ООН по окружающей среде (UNEP) о состоянии воздуха, воды, биоразнообразия, уровне выбросов CO_2;

Национальные доклады об экологическом состоянии Узбекистана и других стран Центральной Азии;

Материалы IPCC (Межправительственная группа экспертов по изменению климата) по динамике глобального потепления;

Результаты онлайн-опросов, проведённых среди студентов, преподавателей и жителей городских и сельских районов, по теме восприятия экологических угроз и готовности к экологически ответственному поведению.

Методы исследования

Контент-анализ научных публикаций, статистических сводок и нормативных документов;

Сравнительный анализ экологических показателей различных регионов (например, индустриализированных и сельскохозяйственных районов);

Картографирование — для визуализации наиболее проблемных экологических зон;

Корреляционный анализ между загрязнённостью окружающей среды и уровнем заболеваемости (с использованием программ SPSS и Excel);

Качественные методы, такие как интервью и фокус-группы, — для изучения отношения людей к вопросам экологии и устойчивого развития;

Геоэкологический подход, включающий анализ пространственного распределения экологических рисков.

Применение вышеуказанных методов позволило выявить как глобальные, так и региональные особенности воздействия экологических проблем на жизнедеятельность населения, а также разработать обоснованные рекомендации по смягчению этих последствий.

Результаты и обсуждение

Результаты исследования подтвердили, что экологические проблемы оказывают всестороннее воздействие на жизнедеятельность человека, затрагивая здоровье, продолжительность жизни, экономическую активность и психологическое состояние населения.

Загрязнение воздуха и заболеваемость населения
В ходе анализа статистических данных ВОЗ выявлено, что в регионах с высоким уровнем загрязнения воздуха (в том числе выбросами промышленных предприятий и автомобильного транспорта) наблюдается устойчивый рост заболеваний дыхательной системы — бронхиальной астмы, хронического бронхита, онкологических заболеваний лёгких. В некоторых мегаполисах, таких как Дели, Пекин, Ташкент, уровень взвешенных частиц PM2.5 превышает норму в 3–5 раз, что приводит к ухудшению качества жизни и преждевременной смертности.

Изменение климата и его социальные последствия
Глобальное потепление сопровождается учащением экстремальных погодных явлений: засух, ливней, ураганов, паводков. Это оказывает разрушительное воздействие на инфраструктуру, сельское хозяйство и водоснабжение. В странах Центральной Азии, включая Узбекистан, наблюдается снижение уровня Аральского моря, увеличение площадей опустынивания и сокращение пригодных для земледелия земель. Эти процессы влекут за собой рост социальной напряжённости, миграцию населения и обострение водных конфликтов.

Загрязнение воды и распространение инфекционных болезней
Недостаток доступа к чистой питьевой воде остаётся критической проблемой для более чем 2 миллиардов человек. Загрязнённые источники воды способствуют распространению кишечных инфекций, гепатита А и холеры. В

сельских районах ряда развивающихся стран до сих пор не реализованы базовые санитарные условия, что напрямую влияет на уровень детской смертности.

Утрата биологического разнообразия и деградация экосистем Сокращение популяций животных и растений разрушает природные пищевые цепи, нарушает экологическое равновесие и лишает человечество потенциальных источников лекарственных веществ. По данным Международного союза охраны природы (IUCN), каждое пятое млекопитающее и треть видов амфибий находятся под угрозой исчезновения. Деградация лесов, особенно в Амазонии и Юго-Восточной Азии, ускоряет изменение климата и разрушает традиционный уклад жизни коренных народов.

Влияние на психическое здоровье и поведение человека Психологические исследования показали, что постоянный стресс, вызванный экологической нестабильностью, ростом числа природных катастроф и угрозой утраты жизненно важных ресурсов, приводит к тревожным расстройствам, депрессии и снижению уровня социальной активности.

Обсуждение

На основе полученных данных можно утверждать, что экологические проблемы должны рассматриваться не только в контексте охраны природы, но и как ключевой фактор, формирующий условия жизни человека. Решение данных проблем требует не только технических и политических усилий, но и формирования экологической культуры, активного участия гражданского общества, а также интеграции принципов устойчивого развития во все сферы человеческой деятельности.

Заключение

Проведённый анализ показал, что современные экологические проблемы оказывают всестороннее и всё более ощутимое влияние на жизнедеятельность человека. Загрязнение окружающей среды, изменение климата, утрата биологического разнообразия и деградация природных ресурсов становятся не только угрозой для экосистем, но и реальным вызовом для общественного здоровья, экономической стабильности и социальной устойчивости.

Результаты исследования подчёркивают необходимость срочных и координированных действий на международном, государственном и региональном уровнях. Особое внимание следует уделить:

Переходу к «зелёной» экономике;

Развитию технологий устойчивого производства;

Экологическому образованию и просвещению населения;

Усилению нормативно-правовой базы в сфере охраны окружающей среды.

Также необходимо сформировать экологически ответственное поведение граждан и развивать культуру бережного отношения к природе. Только комплексный подход, объединяющий усилия науки, власти и общества,

позволит эффективно противостоять экологическим угрозам и обеспечить гармоничное сосуществование человека с окружающей средой в будущем.

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МЕТОДИКА ОБУЧЕНИЯ ПРОСТЕЙШИХ ПАРАЗИТОВ

Аннотация. *Изучение простейших паразитов является важной составляющей курса медицинской биологии и паразитологии. В данной статье рассматриваются современные методики преподавания темы «Простейшие паразиты» в медицинских вузах, включая активные и интерактивные формы обучения, визуализацию жизненных циклов паразитов, использование цифровых технологий и микроскопических практикумов. Особое внимание уделено педагогическим подходам, направленным на формирование клинического мышления у студентов, а также развитию навыков дифференциальной диагностики паразитарных заболеваний. Обоснована эффективность комплексного подхода, сочетающего теоретическую базу с практическими навыками, что способствует лучшему усвоению материала и повышению мотивации к обучению.*

Ключевые слова: *простейшие паразиты, медицинская биология, методика преподавания, паразитология, обучение студентов, активное обучение, микроскопия, педагогические технологии*

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METHOD OF TRAINING THE SIMPLEST PARASITES

Abstract. *The study of protozoan parasites is an important component of the course of medical biology and parasitology. This article discusses modern methods of teaching the topic "Protozoan parasites" in medical universities, including active and interactive forms of learning, visualization of parasite life cycles, the use of digital technologies and microscopic workshops. Particular attention is paid to pedagogical approaches aimed at developing clinical thinking in students, as well as developing skills in differential diagnosis of parasitic diseases. The effectiveness of an integrated approach combining a theoretical base with practical skills is substantiated, which contributes to better assimilation of the material and increased motivation for learning.*

Keywords: *protozoan parasites, medical biology, teaching methods, parasitology, student training, active learning, microscopy, pedagogical technologies*

Введение

Простейшие паразиты занимают важное место в структуре инфекционных и паразитарных заболеваний человека, особенно в странах с тёплым климатом и низким уровнем санитарии. Их изучение является неотъемлемой частью подготовки будущих врачей, так как диагностика и лечение протозойных инфекций требует глубоких знаний о морфологии, цикле развития и эпидемиологии этих организмов.

Тема «Простейшие паразиты» включается в курс медицинской биологии и паразитологии, и эффективность её преподавания напрямую влияет на уровень профессиональной подготовки студентов. Однако традиционные методы обучения не всегда обеспечивают глубокое понимание материала, что делает актуальным внедрение современных педагогических технологий.

Настоящая статья посвящена анализу и совершенствованию методики преподавания данной темы в медицинских вузах. Рассматриваются подходы, направленные на активизацию познавательной деятельности студентов, развитие клинического мышления и формирование устойчивых практических навыков при изучении простейших паразитов.

Материалы и методы

Исследование проводилось на базе кафедры медицинской биологии и генетики Самаркандского государственного медицинского университета в течение 2023–2024 учебного года. В работе приняли участие студенты 1–2 курсов лечебного, стоматологического и педиатрического факультетов.

Для оценки эффективности различных методик преподавания использовались следующие подходы:

Анкетирование студентов — для выявления восприятия материала, уровня интереса и степени усвоения темы;

Наблюдение за учебным процессом — анализ активности студентов при использовании различных форм обучения (лекции, практические занятия, микроскопические исследования);

Сравнительный анализ результатов текущего и итогового контроля знаний — оценка прогресса студентов в группах, обучающихся по традиционной и инновационной методике;

Интерактивные методики — использование презентаций, обучающих видеороликов, электронных микрофотографий, геймификации (викторины, обучающие игры);

Микроскопическая практика — изучение фиксированных и нативных препаратов простейших паразитов, работа с лабораторными журналами.

Полученные данные обрабатывались с применением методов описательной статистики и сравнительного анализа, что позволило сделать выводы об эффективности применяемых методических подходов.

Результаты и обсуждение

Результаты анкетирования показали, что более 75% студентов считают изучение простейших паразитов сложной, но крайне важной темой в курсе

медицинской биологии. При этом те группы, где применялись интерактивные методы обучения (видеоматериалы, 3D-модели, микроскопическая практика), демонстрировали более высокий уровень вовлечённости и мотивации.

Сравнительный анализ текущей успеваемости показал, что студенты, обучающиеся с применением современных педагогических технологий, в среднем набирали на 18–22% больше баллов на тестировании по сравнению с группами, обучающимися по традиционной схеме. Особенно эффективными оказались практические занятия с использованием микроскопов, во время которых студенты могли самостоятельно выявить морфологические особенности *Entamoeba histolytica*, *Giardia lamblia*, *Toxoplasma gondii* и других простейших.

Также отмечено, что внедрение игровых форматов — викторин, интерактивных заданий и групповых обсуждений — способствует лучшему запоминанию терминологии и жизненных циклов паразитов. Учащиеся стали активнее участвовать в дискуссиях, задавать вопросы и связывать теоретические знания с клиническими примерами.

Таким образом, комбинированный подход к преподаванию темы простейших паразитов — с включением визуальных, практических и цифровых компонентов — значительно повышает качество усвоения материала и формирует у студентов начальные элементы клинического мышления.

Заключение

Проведённое исследование подтвердило высокую эффективность современных методик преподавания темы «Простейшие паразиты» в системе медицинского образования. Использование интерактивных технологий, визуальных средств и микроскопических практикумов способствует повышению интереса студентов к изучаемому материалу, формированию устойчивых знаний и развитию клинического мышления.

Особое значение имеет активное вовлечение студентов в учебный процесс через игровые и проблемно-ориентированные формы обучения. Практико-ориентированный подход позволяет не только лучше усвоить теоретический материал, но и развивать навыки диагностики паразитарных заболеваний, что особенно важно для будущих врачей.

Таким образом, внедрение инновационных педагогических решений при обучении паразитологии должно стать приоритетом в медицинских вузах, поскольку это напрямую влияет на качество подготовки специалистов и готовность их к практической деятельности в клинической среде.

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ОСНОВНЫЕ ПРИЧИНЫ ОБРАЗОВАНИЯ ОПУСТЫНИВАНИЯ В ЗЕРАВШАНСКОЙ ДОЛИНЕ

Аннотация: *Зеравшанская долина — один из наиболее благоприятных регионов для развития общества и производства различных сельскохозяйственных культур, включая технические. Однако с ростом численности населения и увеличением объемов производства экологическая обстановка в долине значительно изменилась.*

Настоящая работа посвящена одному из актуальных вопросов современной географической науки — изучению экологических условий Зеравшанской долины. Основное значение исследования заключается в детальном анализе экологической ситуации и её последствий в средней части долины. Особое внимание уделено усилению влияния антропогенного фактора на окружающую среду.

Ключевые слова: *деградация, растительный покров, почвенная эрозия, ветровая эрозия, засоление, опустынивание, ирригация.*

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MAIN CAUSES OF DESERTIFICATION IN THE ZERAVSHAN VALLEY

Abstract: *The Zeravshan Valley is one of the most favorable regions for the development of society and the cultivation of various agricultural crops, including industrial crops. However, with the growth of the population and the increase in production volumes, the ecological situation in the valley has changed significantly. This study addresses one of the pressing issues of modern geographical science — the analysis of ecological conditions in the Zeravshan Valley. The main significance of the research lies in the detailed examination of the environmental situation and its consequences in the central part of the valley. Special attention is given to the increasing impact of anthropogenic factors on the natural environment.*

Keywords: *degradation, vegetation cover, soil erosion, wind erosion, salinization, desertification, irrigation.*

Основные нарушения природной среды Зеравшанской долины связаны с хозяйственной деятельностью и экстенсивным развитием производительных сил. Несмотря на значительные экологические резервы биосферы и её способность адаптироваться к изменённым условиям, вызванным деятельностью человека, многие антропогенные воздействия уже привели — и продолжают приводить — к серьёзным негативным последствиям, с которыми биоценозы региона не способны справиться ни сейчас, ни в обозримом будущем. Прежде всего это касается загрязнения биосферы

токсичными веществами, а также интенсивного и экологически не обоснованного использования природных ресурсов. Такая эксплуатация подрывает способность природы к самовоспроизводству и восстановлению.

В результате складывается критическая экологическая ситуация. Изучение причин и последствий этих нарушений является крайне важной задачей. В условиях нарастающего экологического кризиса вопросы устойчивого развития и охраны окружающей среды в Зеравшанской долине приобретают особую актуальность.

В основе большинства случаев опустынивания средней части Зарафшанской долины лежат следующие процессы: 1) деградация растительного покрова, 2) ветровая эрозия, 3) водная эрозия, 4) засоление почв, а также 5) техногенное влияние человека.

Одним из важнейших Типов процесса опустынивания является деградация растительного покрова. Установлено, что снижение продуктивности пастбищ происходит в результате чрезмерного выпаса, регулярной вырубки кустарников и полукустарников на топливо. Кроме того, на состоянии растительности губительно сказываются геологоразведочные работы, строительство автомобильных дорог, техноэрозия и др. Встественной причиной деградации пастбищных экосистем считается неиспользование их из-за длительного отсутствия выпаса или В связи с необводненностью, что ведет к образованию поверхностной корки за счет разрастания мохово-лишайниковых сообществ. Мохово-лишайниковая корка ухудшает условия жизни растений и их возобновление, сказывается на снижении урожайности пастбищ. Например, на территориях Северо-Нуратинского и Каратау-Актауского ландшафтах происходит бесхозяйственное уничтожение горно-долинных кустарников и лесов, вследствие чего происходит деградация растительного покрова. В результате ликвидации растительного покрова и гумуса освещенность поверхности увеличивается в несколько раз. Нагревание возрастает на 18-58%, влажность почвы снижается в 2-3 раза, альбедо растет, достигая 40-50%. Кроме того, воздействие транспортных средств и геологоразведочных работ на изучаемой нами территории вызвали ликвидацию растительного покрова на большой площади, в результате расширились площади барханных песков, сформировались многочисленные котловинные формы рельефа. Транспортировка буровых вышек в монтированном виде, передвижение тяжеловесных автомашин и других механизмов по закрепленным пескам вызвало деградацию пастбищ.

Отсутствие в ряде хозяйств пастбище смены, то есть беспрерывный выпас, влияет на деградацию пастбищ. Наблюдения показывают, что бессменный выпас приводит к замене одних растений другими: высокоценные весенние пастбища с питательными кормами из ранга, конгурбаша и ковыля обедняются, в травостое начинают преобладать пастбищные сорняки бурген, борыткен, козы кулак и др.

Ценные сведения по использованию пастбищ эфемерового типа дает Л.С. (1971). Она пишет, что 100%-пое стравливание, кормовой массы

пастбищных растений весной в течение 3 лет является вредным: уменьшается урожай основных компоненте покрова ранга, конгурбаша и других, увеличивается количество несъедобного и сорного крупнотравья. Таким образом, при выпасе в весенний сезон участки стравливания нужно менять, зимой все разности полынно-эфемеровых пастбищ можно использовать бессменно.

Полное отсутствие выпаса также ухудшает пастбища, снижая запасы кормовой массы, так как не происходит рыхления поверхности почвы. Плотный покров изо мха затрудняет вегетацию эфемеров и эфемроидов, в результате качество пустыни ухудшается.

Склоны низкогорья земель Чакылкалянского и Каратепинского среднегорных ландшафтов использовались под богарными посевами и нерегулируемый выпас скота, что привело к сильному развитию эрозии, а истребление кустарников ее усилило.

Из-за рубки арчи земель крутосклонового среднегорья на высотах от 1200 до 1800 м. Чакылкалянских и Каратепинских ландшафтов на всем северном и даже южном склоне произошло исчезновение густых лесов. Арча сохранилась лишь в некоторых труднодоступных местах.

Ветеровые эрозии. Главным рельефообразующим фактором в песчаной пустыне является ветровая деятельность. Ветер обуславливает дефляцию, транспортировку и аккумуляцию песка.

Исследователи рассматривают передвижение песка в его простейшем виде как движение ветропесчаного потока. Такое передвижение песка получило название поземки, или летучих песков. Ветропесчаный поток при диаметре зерен песка 0,25-0.01 мм начинает свое движение при скорости ветра у поверхности более 4 м/с. Ветропесчаный поток является результатом взаимодействия воздушного потока и песка (Бабаев и др., 1982).

Образование форм рельефа песков в результате деятельности ветра А.б. Федорович (1970) объясняет следующим образом: по мере того как ветер начинает воздействовать на вновь образованную равнину, он создает сначала элементарно простые и мелкие формы рельефа рябь, заструги, кучевые скопления. Потом постепенно развиваются все более сложные всхолмления-волнистость, отдельные барханы (когда высота их начинает превышать 40-45 см). Постепенно вырабатываются все более крупные и сложные формы рельефа. Скорость образования песчаных форм зависит, прежде всего, от интенсивности постоянного ветра, объема материала, приносимого ветром, наличия и характера растительного покрова на выдуваемом месте и т.д.

В критериях, разработанных для оценки ветровой эрозии (Харин и др., 1983). в первую очередь внимание обращается на состояние поверхности рельефа. Если участок экосистемы, подверженный дефляции только в начальной стадии, занимают до 25% площади контура, то это участок относится к классу слабого опустынивания, например Жамбайский, Пайарыкский, Окдарьинский районы. Участки опустынивания территорий, подвергающиеся эоловым процессам в интенсивном темпе, с хорошо

выраженными барханными формами рельефа с малым количеством растительного покрова, относятся к классу сильного опустынивания, например Пахтачийский, Нарпайский районы средней части Зарафшанской долины.

Водная эрозия один из существенных процессов опустынивания.

Хотя в аридной зоне количество атмосферных осадков невелико, эрозия почв господствует на значительной площади. Смыв почвы часто называют плоскостной, или поверхностной, эрозией. Вода со склонов почти всегда стекает не сплошным слоем, а струями, которые вызывают смыв верхних горизонтов почвы. В результате на поверхности наблюдаются струйчатые размывы от слабой до довольно хорошо выраженной формы.

Условия, определяющие опасность эрозии, во многом зависят от природных особенностей и характера хозяйственного использования земель. Прямое воздействие на эрозию оказывают атмосферные осадки, вызывающие сток в определенном объеме. При этом для проявления эрозии практическое значение имеет режим или интенсивность выпадения осадков, особенно жидких.

Струйчатые размывы могут способствовать и зарождению линейной эрозии. Если их не заравнивать, то при очередном снеготаянии или ливне они становятся коллекторами, концентрирующими поверхностный сток вод, и перерастают в типично линейные формы эрозии сначала в промоины, а затем в овраги.

Необходимым условием для формирования стока является уклон поверхности. С увеличением уклона смыв почвы дождевыми осадками увеличивается. По мере увеличения длины склона сток воды и смыв почвы возрастают. При сильном ливне различия в смыве на длинном и коротком склоне уменьшаются. Эрозия почв непосредственно зависит также, от формы и экспозиции склонов, которые довольно изучены М.Н.Заславским (1979), М.Н.Панковым (1965) и др.

Установлено, что смыв почв с наибольшей силой происходит на выпуклых склонах, а южные склоны всюду представлены эродированными почвами.

Так, например, группа типов земель крутосклонового среднегорья Чакылкалянского и Каратепинского ландшафтов средней части Зарафшанской долины характеризуются интенсивным развитием эрозионных процессов и солевых потоков, возникающих из-за резкого пересеченного рельефа, крутых склонов, слабой закрепленности почв корневой системой растительности и крайне неровным выпадением осадков. Все это способствует образованию обильных поверхностных стоков, которые смывают почвы крутых склонов.

Изучение старых аэродромов показало уровень загрязнения почво грунтов пестицидами, превышающими норму в почве до 500-1000 раз. Путем воздушной и водной миграции они попадают из почвы в поверхностные и подземные воды и загрязняют их. Через пищевые цепи эти соединения попадают в организм человека и отравляют его, в результате возрастает

уровень детской смертности, заболеваемости различными инфекционными болезнями, сердечно-сосудистыми и др.

В условиях широкого развития опустынивания особое значение приобретает оптимизация природной среды. Улучшение экологического состояния и борьба с опустыниванием в настоящее время должна стать неотъемлемой и сверх приоритетной частью основных хозяйственных действий. Человеку необходимо перестроить свое мышление и отношение к жизни и к природе.

К настоящему времени накоплен достаточный арсенал эффективных методов по борьбе с процессами опустынивания, применение которых способствует предотвращению деградации сельхозугодий, восстановлению и обогащению продуктивности экосистем. Выбор того или иного метода борьбы зависит от конкретной природной обстановки, степени и характера влияния человека на природную среду.

Накопленные научные материалы позволяют утверждать, что засуху необходимо рассматривать как одну из основных причин опустынивания изучаемой территории.

Несмотря на значительный объем накопленной информации об аридных механизмах засухи, мы пока не в состоянии прогнозировать время начала, масштаба и продолжительности этого явления. Воздействие засухи временно. Несомненно, что полностью устранить влияние засухи можно лишь орошения площадей, подверженных засухой. Поэтому большое внимание необходимо обращать на повышение культуры земледелия, которые могут ослабить вред засухи и обеспечить высокие урожаи. Основными мерами земледелия, снижающие влияние засухи являются лих лесомелиоративные мероприятия, полезащитное лесоразведение, структура посевных площадей, применение рациональных систем обработки почвы, борьба с вредителями и болезнями растений, рациональное использование сельскохозяйственной техники.

Как известно. 128,8 тыс.га орошаемых земель, средней части Зарафшанской долины являются засоленными или 34,5% общеорошаемых земель. Орошаемое земледелие эго основа сельскохозяйственного производства.

Орошаемое земледелие должно обеспечить решение двух взаимосвязанных комплексных проблем: 1) широкое комплексное освоение земельных ресурсов; 2) повышение плодородия почвы для более эффективного использования уже освоенных земель. В результате развития в течение многих веков орошаемого земледелия без строительства дренажных систем произошло вторичное засоление земель. В связи с тем, что не все каналы имеют противофильтрационную одежду, увеличивается испарение воды; в 1,5-2 раза заборы воды превышают нормативные, что, в свою очередь, приводит к подъему уровня грунтовых вод, засолению больших земель из сельскохозяйственного оборота. Если уровень минерализованных грунтовых вод не снижен, и они не отводятся исправным дренажом, то их испарение и

транспирация сопровождаются накоплением солей в почвах и в самих грунтовых водах.

Основными предупредительными мерами, снижающими фильтрацию воды в оросительных каналах, которая является главной причиной катастрофического подъема грунтовых вод, является строительство всей сети каналов в лотках, бетонных руслах или закрытых трубопроводах. Вторая предупредительная мера на новых оросительных системах строительство с профилактической целью вертикального машинного дренажа при глубоких грунтовых водах, чтобы снять угрозу их поднятия. Третьей мерой борьбы с засолением почв являются глубокий дренаж, поддерживающий уровень грунтовых вод на глубине 2,5-3 м, и регулярный смыв солей, накапливающихся в верхней почвенной толще при орошении. Четвертая мера - осуществление коренного переустройства существующей коллекторно-дренажной сети, строительство новых магистральных коллекторов.

Борьба с опустыниванием на пастбищных массивах, например на территориях Северо- Нуратинского, Каратау-Актауского, Каракчатау-Гобдунтауского ландшафтах средней части Зарафшанской долины, направлена на повышение продуктивности пастбищных фитоценозов. В последние десятилетия в условиях роста поголовья скота на пустынных пастбищах особо важное значение приобретает осуществление на практике научно обоснованных принципов пастбищного хозяйства, направленных на увеличение продуктивности естественных пастбищных угодий и создание пастбищных агрофитоценозов.

В процессе всестороннего исследования различных методов ведения пустынного хозяйства установлено, что основным принципом рационального использования пастбищ является пастбищеоборота. Пастбищеоборот организация оптимального это система использования пастбищного массива, гарантирующая его высокую продуктивность. Принцип пастбищеоборота заключается в периодическом чередовании по годам сроков выпаса скота на одних и тех же пастбищных массивах. Это позволяет соблюдать нормы нагрузки скота на единицу площади пастбища, что предохраняет его от чрезмерного стравливания.

Развитие процесса опустынивания средней части Зарафшанской долины обусловлено особенностями природных условий территории и характером использования естественных ресурсов.то

При оценке развития опустынивания следует опираться на достоверную информацию о типах, факторах и причинах опустынивания. Они же служат основой для определения состояния развития опустынивания.

Влияние человека на природу сказывается на развитии опустынивания на относительно большой части описываемой территории, охватывающих целые группы природных районов. Это обстоятельство требует разработки научно обоснованных вариантов прогноза опустынивания средней части Зарафшанской долины на перспективы в связи с развитием отраслей народного хозяйства. Комплексное прогнозирование развития опустынивания

основа для обоснования практических мероприятий по борьбе с ним. Чем достовернее прогноз, тем более эффективны меры по предотвращению развития неблагоприятных процессов.

Рациональное использование природных ресурсов на научной основе - единственный правильный путь для их сохранения на длительное время и предотвращения опустынивания. орошаемых земель.

Мы в настоящей работе попытались целесообразно изучить следующие вопросы, возникшие в связи с проблемами опустынивания: 1) дать достоверный прогноз интенсификации опустынивания аридной зоны средней части Зарафшанской долины под влиянием факторов научно технического прогресса; 2) определить опасность опустынивания орошаемых земель в связи с усложнением регулирования водно-солевого режима почв, развитием ирригационной эрозии и дефляции; 3) осуществить оптимальные варианты практических мероприятий по борьбе с процессами опустынивания в средней части Зарафшанской долины; 4) провести всесторонние и глубокие теоретические исследования в области опустынивания.

Разумеется, названные вопросы не исчерпывают всей проблемы. Для решения проблемы опустынивания необходимы глубокие и всесторонние исследования, охватывающие всю территорию аридной зоны средней части Зарафшанской долины. Следуют создать комплексные специальные научные станции для комплексного изучения процессов опустынивания предгорных равнин, орошаемой и богарной зон описываемой территории.

Заключение

Проведённый анализ показал, что опустынивание в Зеравшанской долине обусловлено комплексом взаимосвязанных природных и антропогенных факторов. Основными причинами являются нерациональное использование водных и земельных ресурсов, чрезмерная ирригация, вызывающая засоление почв, деградация растительного покрова, а также эрозионные процессы — как водная, так и ветровая эрозия. Существенную роль в усилении опустынивания играет также рост антропогенной нагрузки, связанный с расширением сельскохозяйственной деятельности, урбанизацией и промышленным развитием региона.

Настоящее экологическое состояние требует принятия срочных и эффективных мер по охране окружающей среды, восстановлению деградированных земель и внедрению устойчивых форм природопользования. Только комплексный подход, сочетающий научные исследования, мониторинг и практические меры, позволит замедлить процессы опустынивания и сохранить природный потенциал Зеравшанской долины для будущих поколений.

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УЗБЕКИСТАН НА ПУТИ К ЭКОЛОГИЧЕСКОЙ УСТОЙЧИВОСТИ: ЦЕЛИ, МЕРЫ И ПЕРСПЕКТИВЫ РАЗВИТИЯ

Аннотация. *В статье рассматриваются приоритетные направления государственной экологической политики Узбекистана, изложенные в рамках Стратегии «Узбекистан – 2030» и Государственной программы на 2025 год. Освещаются практические шаги по охране окружающей среды, развитию «зелёной экономики», управлению водными ресурсами, переработке отходов и использованию возобновляемых источников энергии. Приведены цели национальных экологических проектов, законодательные реформы, а также усилия по вовлечению общества в вопросы устойчивого развития. Особое внимание уделяется интеграции экологических инициатив с международными обязательствами Узбекистана.*

Ключевые слова: *Узбекистан-2030, зелёная экономика, экологическая устойчивость, возобновляемые источники энергии, водные ресурсы, экологическая политика, устойчивое развитие.*

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UZBEKISTAN ON THE PATH TO ECOLOGICAL SUSTAINABILITY: GOALS, MEASURES, AND DEVELOPMENT PROSPECTS

Annotation. *The article examines the priority areas of the state environmental policy of Uzbekistan, set out in the framework of the Strategy "Uzbekistan - 2030" and the State Program for 2025. Practical steps for environmental protection, development of a "green economy", water resource management, waste recycling and the use of renewable energy sources are covered. The objectives of national environmental projects, legislative reforms, and efforts to engage society in sustainable development issues are presented. Particular attention is paid to the integration of environmental initiatives with Uzbekistan's international obligations.*

Key words: *Uzbekistan-2030, green economy, environmental sustainability, renewable energy sources, water resources, environmental policy, sustainable development.*

Экологические вызовы стали неотъемлемой частью глобальной повестки XXI века. Узбекистан, находясь в зоне повышенного экологического риска, предпринимает активные шаги к экологически устойчивому будущему. Необходимость перехода к «зелёной экономике» в Узбекистане объясняется тем, что значительная часть энергии, потребляемой в национальной экономике, производится с использованием не возобновляемых природных ресурсов, запасы которых ограничены. Кроме того, стремительное развитие промышленности приводит к загрязнению окружающей среды, дефициту воды, а также к обострению экологических проблем, связанных с высыханием Аральского моря. Устойчивое развитие экономики Узбекистана и разработка долгосрочной стратегии структурных преобразований требуют учёта как внутренних, так и глобальных процессов и вызовов. Согласно данным Всемирной метеорологической организации ООН, среднегодовая глобальная температура воздуха по сравнению с уровнем 1880 года увеличилась на 1 °C. В Узбекистане же за этот же период среднегодовая температура воздуха повысилась на 1,6 °C — с 13,2 до 14,8 °C. Темпы повышения температуры в стране опережают среднемировые показатели. Потепление климата оказывает негативное влияние на состояние экосистем и усугубляет экологическую ситуацию в таких регионах, как Республика Каракалпакстан, Хорезмская, Бухарская, Навоийская, Кашкадарьинская, Самаркандская и Сурхандарьинская области.

К числу наиболее актуальных направлений относятся такие вопросы, как охрана окружающей среды, расширение зеленых насаждений, использование возобновляемых источников энергии, развитие систем переработки отходов и эффективное управление водными ресурсами. В этой связи в Государственной программе до 2025 года отражены ряд целей и задач.

В частности, в этом году планируется создать сеть «Тенистых пешеходных улиц» путем высадки деревьев и растений вдоль пешеходных и отдельных велосипедных дорожек, строящихся для населения, с целью улучшения экологического облика микрорайонов, повышения уровня озеленения улиц, создания экологически комфортной и благополучной среды проживания.

Также планируется построить 80 объектов инфраструктуры и более 110 километров рекреационных троп вдоль побережья и рек. Такие цели и задачи способствуют увеличению количества зеленых насаждений в удобных для проживания регионах, тем самым укрепляя здоровье граждан.

Кроме того, рассматривается вопрос эффективного использования дождевых и сточных вод, внедрения системы полива деревьев в микрорайонах с применением современных водосберегающих технологий и, как следствие, увеличения уровня озеленения. Следует отметить, что сегодня, когда проблема нехватки воды становится глобальной, эффективное использование имеющихся водных ресурсов приобретает первостепенное значение. Одним из наиболее разумных решений является сбор и использование воды, особенно в сезон дождей, которая является безвозмездным даром природы для

озеленения. Поставленные в программе задачи по высадке 200 млн. деревьев и кустарников в рамках национального проекта «Зеленая зона» и проекта «Мой сад», а также по использованию солнечного освещения в «зеленых садах» и «зеленых общественных парках» значимы и тем, что направлены на решение экологических проблем. Зеленые зоны это территории (элементы градостроительства) населенных пунктов рекреационного назначения, а также прилегающие к ним территории, занятые зелеными насаждениями, выполняющие природоохранные функции, используемые также для отдыха населения.

Узбекистан присоединился к Парижскому соглашению ООН об изменении климата, а также реализует экологические проекты совместно с Региональным экологическим центром Центральной Азии (РЭЦЦА), Глобальным экологическим фондом (ГЭФ) и другими международными организациями. Это позволяет использовать глобальный подход к решению экологических проблем.

За последние годы были реализованы ряд мероприятий по охране окружающей среды. В частности, для улучшения качества воздуха увеличено количество станций мониторинга загрязнения воздуха в Ташкенте, Нукусе, Карши и других крупных городах; в сотрудничестве с программами Европейского Союза и ООН была запущена «Интеллектуальная система мониторинга»; ужесточен контроль за выбросами транспортных средств, обновлены требования к качеству бензина.

В части для рационального использования водных ресурсов: с 2021 года система капельного орошения увеличена в 3 раза; в рамках программ «Благоустроенное село» и «Благоустроенная махалля» улучшена инфраструктура питьевого водоснабжения: в 2022–2023 годах более 2,5 млн человек получат доступ к чистой питьевой воде, модернизируются объекты хранения воды (например, восстановлены территории вокруг Сардобинского водохранилища).

В сфере обращения с твердыми бытовыми отходами: в Ташкенте в 2022 году запущены пилотные проекты по раздельному сбору отходов через систему «Экосан»; увеличивается количество заводов по переработке твердых бытовых отходов за счет внедрения новых технологий в Андижанской, Самаркандской и Бухарской областях; исходя из принципа «зоны, свободной от отходов», некоторые районы объявлены «зелеными зонами».

О борьбе с изменением климата: В 2023 году в Узбекистане принята «Национальная стратегия адаптации к изменению климата». Целью стратегии является сокращение выбросов CO_2 на 35% к 2030 году.

В области солнечной и ветровой энергетики: в Навоийской и Бухарской областях запущены солнечные электростанции.

Экологическое образование и гражданское участие: в 2022 году началось введение в школах и ВУЗах в качестве обязательного предмета «Экология» и «Зелёная экономика»; начиная с 2023 года ежегодно будут проводиться экологические недели по всей стране 5 июня — во Всемирный

день окружающей среды; запущены проекты «Зеленая зона», «Экологическое движение» и другие с участием молодежи.

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ИССЛЕДОВАНИЕ ВОДНОГО И СОЛЕВОГО БАЛАНСА МЕЛИОРИРУЕМЫХ ЗЕМЕЛЬ С ИСПОЛЬЗОВАНИЕМ СИСТЕМНОГО АНАЛИЗА

Аннотация: *В работе представлены результаты исследований водного и солевого баланса мелиорируемых земель с использованием системного анализа. Использование балансовых моделей на опытном участке позволило выявить особенности водно-солевого режима и обосновать мелиоративные мероприятия.*

Ключевые слова: *водный баланс, солевой режим, мелиорация, системный анализ, почвенные свойства, опытный участок.*

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STUDY OF WATER AND SALT BALANCE OF RECLAIMED LANDS USING SYSTEM ANALYSIS

Abstract: *This study presents the results of water and salt balance analysis of reclaimed lands using system analysis. Balance modeling at the pilot site helped to identify water-salt regime features and justify reclamation measures.*

Keywords: *water balance, salt regime, land reclamation, system analysis, soil properties, experimental site.*

Рациональное использование и мелиорация земель в условиях сложных природных факторов требуют глубокого изучения водного и солевого режима почв. В данной работе рассматривается методология исследования водных и солевых балансов на опытно-производственном участке, расположенном в условиях сазовой зоны. Актуальность исследования заключается в необходимости повышения эффективности мелиоративных мероприятий за счет применения системного анализа и балансовых методов.

Материалы и методы

Методология исследований основана на принципах системного анализа, при котором объект — орошаемый массив — рассматривается как система, состоящая из взаимосвязанных блоков: атмосфера, почвенный слой и грунтовые воды. Применены уравнения общего и частного водного и солевого баланса, отражающие основные процессы:

$\Delta Wo = Oc - Op - E + (\overline{П} + \overline{О}) + Фк \pm Р - Д - \overline{С}\Delta Wпов = Oc - Op - И - Bn - \overline{С}\Delta Wпоч =$

=Bn±g-TpΔWr=±g±P+(П̄+Ō)+Фк-Д

Здесь: Е=И+Тр

Для сокращения числа параметров объединены уравнения поверхностных и почвенных вод. Принята следующая упрощённая модель:

ΔWo=Oc+Орб-Е±Р-Д-С̄ΔWn=Oc+Орб-Е±g-С̄ΔWr=±g±Р-Д

Измерения проводились на опытно-производственном участке совхоза «Ямбол». Использовались следующие методы:

Установлены гидрометрические посты на каналах, коллекторе, скважинах и дренажных сооружениях.

Пробурены наблюдательные и пьезометрические скважины для контроля за режимом подземных вод.

Закладывались почвенные площадки (15×5 м) для анализа динамики водного и солевого режима.

Механический состав почв. Проведён анализ механического состава почв по Качинскому Н.А. (1969). Почвы участка в основном представлены средними и тяжёлыми суглинками, а также лёгкими глинами (см. таблицу 1).

Таблица 1
Механический состав почвогрунтов опытного – производственного участка

С	Слой почвы	Размер механических элементов (мм) и их содержание в (%)								Наименование почвы по механическому составу (Качинский Н.А., 1969)
		1… 0,25	0,25… 0,1	0,1… 0,05	0,05… 0,01	0,01… 0,005	0,005 … 0,01	<0,001	<0,01 физическая глина	
1	2	3	4	5	6	7	8	9	10	11
1	0…9	4,77	1,27	17,5	32,24	17,75	16,73	10,21	44,67	Средний суглинок
	9…16	4,23	1,46	2,97	33,12	19,87	23,33	14,97	58,17	- “ -
	16…30	3,73	1,79	7,27	39,69	12,76	27,63	7,08	47,52	- “ -
	30…69	3,79	1,69	2,12	36,56	20,20	22,45	19,19	55,84	- “ -
	69…92	5,17	0,49	2,16	34,43	17,22	25,45	17,09	59,75	- “ -
	92…103	11,40	0,74	2,77	15,83	16,05	31,02	22,19	69,26	Легкая глина

	103…126	4,26	2,05	9,31	19,52	15,51	20,57	28,78	64,86	- “ -
2	0…14	4,88	2,01	5,19	28,10	14,71	25,70	19,41	59,82	Тяжелый суглинок
	14…41	4,67	2,01	8,00	33,57	9,29	24,70	17,75	51,74	- “ -
	41…59	2,87	0,44	5,77	37,90	14,59	27,97	10,10	53,02	- “ -
	59…83	2,06	0,77	7,57	37,51	7,54	29,78	14,77	52,09	- “ -
	83…109	5,49	0,67	4,62	28,47	13,35	28,56	18,84	60,75	Легкая глина
3	0…16	1,99	0,49	3,74	31,56	14,14	28,55	19,53	62,22	- “ -
	16…43	1,88	0,24	0,93	39,69	12,24	30,71	14,31	57,56	- “ -
	43…84	1,29	0,25	2,30	34,58	16,15	30,08	15,85	61,58	- “ -
	84…101	4,28	1,09	1,54	26,02	19,80	21,97	25,30	67,07	Легкая глина
	101…123	6,37	2,30	21,58	24,15	10,63	25,13	9,84	45,60	Тяжелый суглинок
1	2	3	4	5	6	7	8	9	10	11
4	0…19	3,83	1,23	4,82	43,51	19,70	21,07	5,84	46,61	- “ -
	19…52	4,90	1,22	5,64	47,63	27,61	7,50	5,50	40,61	Средний суглинок
	52...86	3,67	1,32	1,75	34,97	14,96	23,27	20,06	58,29	Тяжелый суглинок
	86…113	5,53	1,24	4,29	26,07	15,20	25,96	21,71	62,87	Легкая глина
	113…141	4,61	0,90	0,73	29,50	11,11	26,89	26,26	64,26	- “ -
5	0…33	3,69	0,99	6,20	31,84	10,74	29,85	16,96	57,28	Тяжелый суглинок
	33…69	1,59	0,99	7,88	51,40	24,99	3,74	9,50	38,23	Средний суглинок
	69…102	8,04	1,31	8,06	39,37	17,59	20,92	4,71	43,22	- “ -
	102…142	13,16	1,41	9,93	29,94	11,26	26,08	8,22	45,56	Тяжелый суглинок

Гидрогеологические условия участка

Участок расположен в зоне распространения луговых почв с напорным питанием из нижележащих горизонтов и слабой естественной дренированностью. Грунтовые воды залегают на глубине 1,0–1,5 м. Вертикальный дренаж функционирует с 1972 года. Оросительная сеть включает земляные каналы с расходом ~50 л/с. Наблюдения за водным

режимом проводились регулярно, включая вегетационный и межвегетационный периоды.

Обсуждение

Методика, основанная на балансовом подходе, позволила получить полные данные о динамике водного и солевого режима. В условиях периодического поступления оросительных и грунтовых вод прослеживается цикличность процессов влагонакопления и соленакопления. Показано, что анализ балансов даёт точную количественную картину, однако для прогнозирования требуется дополнительно учитывать процессы массопереноса и взаимодействие блоков системы.

Заключение

Применение системного анализа и балансовых методов на опытно-производственном участке позволило получить достоверные данные о режимах влаги и солей. Полученные результаты могут быть использованы при планировании и проектировании мелиоративных мероприятий. Рекомендуется продолжить исследования для уточнения моделей переноса и уточнения прогностических расчетов.

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РЕДКИЙ СЛУЧАЙ ПОДОСТРОГО БРУЦЕЛЛЕЗНОГО МЕНИНГОЭНЦЕФАЛИТА

Аннотация: *Представлен редкий случай клиника бруцеллезного менингоэнцефалита. Указывается на особенности его клинического течения с поражением ЦНС, приводятся различные лабораторные анализы и обсуждаются методы рациональной терапии.*

Ключевые слова: *бруцеллез, менингоэнцефалит, диагностика, люмбальная пункция, терапия*

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THE ONE UNCOMMON CASE OF BRUCELLOSIS MENINGOENCEPHALITIS

Annotation: *Nowadays, a rare case of brucellosis meningoencephalitis is presented. Indicated on the features of its clinical course, the various laboratory analyzes are ad- duced and the methods of rational therapy are discussed.*

Keywords: *brucellosis, meningoencephalitis, diagnosis, lumbar puncture, therapy*

Ввдение. Поражение нервной системы при бруцеллезе встречается довольно часто. Давно замечено, что частота поражения нервной системы возрастает по мере перехода острого бруцеллезного процесса в затяжной и хронический. Многие больные предъявляют жалобы на головную боль, раздражительность, парестезии, боли в пояснице и ногах [2,3]. У них можно выявить симптомы пояснично-крестцового радикулита, неврита, невралгий, вегетососудистой дистонии. Именно поэтому в бруцеллезные отделения инфекционных стационаров часто приглашают на консультацию врачей – неврологов [5].

Известно, что при бруцеллезе в патологический процесс может вовлекаться периферическая и вегетативная нервная система. Периферическая нервная система, по данным различных авторов, наблюдается в 37-90% [1]. Наиболее часты - невралгии, невриты, плекситы, причем особенно часто поражаются седалищный нерв и пояснично-крестцовое сплетение [2,4]. Вегетативные нарушения особенно характерны для хронического бруцеллеза. Е. С. Белозеров (1985) наблюдал их у 96,2% больных.

В то же время поражение центральной нервной системы встречается исключительно редко [5]. Например, тот же Е. С. Белозеров в 2000 году сообщает, что диагноз менингит в их исследовании был выставлен только у 1,6% больных с подострым бруцеллезом. Течение бруцеллезного менингита или менингоэнцефалита обычно вялое и затяжное, без четкой выраженности менингеальных симптомов [6]. Наиболее постоянные симптомы менингита - невыраженные головная боль и тошнота, повышение температуры до субфебрильных цифр. Симптомы Брудзинского и Кернига выражены слабо. Спинномозговая жидкость вытекает под небольшим давлением и, как правило, прозрачная с положительной реакцией Панди и Нонне-Апельта и повышенным цитозом. Цитоз - смешанного характера, в одних случаях преобладают лимфоциты, в других - нейтрофилы.

Мы наблюдали редкий случай бруцеллезного менингоэнцефалита весной 2025 года [7,8].

Описание клинического наблюдения. Больной Ж.А. 29 лет поступил в стационар 29 апреля 2025 г. с жалобами (со слов брата) на вялость, понижение аппетита, заторможенность, температура, головные боли, рвота.

Из анамнеза заболевание началось 5 марта 2025 года со слабостью, ознобом, повышением тепературы. В последующие дни эти симптомы нарастали, наблюдался потливость, проходящие боли в суставах. Дома принимал парацетамол, цитрамон, состояние не улучшилось. 15 марта 2025 года обратился в амбулаторию и лечился с диагнозом грипп. От проведенного лечения эффекта не было и 3 апреля 2025 года обратился в районную поликлинику, после обследования назначили амбулаторное лечение. От полученное лечение эффекта не было. 15 апреля 2025 года обратился к частному врачу и получал опят амбулторное лечение. Несмотря на лечение у больного нарастала общую слабость, боли в суставах рук и ног, повышенную температуру, выраженную потливость, неприятные ощущения в пояснично-крестцовой области. Были жалобы и неврологического характера - на периодически появляющуюся тупую монотонную головную боль, раздражительность, нервозность, плохой сон, кожные парестезии, заторможенность. В последние дни головные боли нарастали, наблюдался рвота и заторможенность. В марте и апреле 2025 года похудел на 16 кг. 29 апреля 2025 года с братом обратились в областную многопрофильную больницу и после консультации врачей направили в областную клиническую инфекционную больницу.

Из анамнеза в март-апрель месяцах 2025-года среди овец наблюдались 7 случев выкидыша и мертворождения.

При осмотре больного, что обращало на себя внимание, было бледное, амимичное лицо с полностью закрытым правым глазом. При искусственном поднятии правого верхнего века можно было заметить расходящееся косоглазие и мидриаз. Острота зрения на правом глазу, со слов пациента, снизилась. Левый глаз функционировал относительно хорошо. При попытке взглянуть на предметы обоими глазами - больной отмечал двоение.

Продолжая клинический осмотр заболевшего, мы выявили слабовыраженные менингеальные симптомы - ригидность затылочных мышц, симптом Кернига и Брудзинского верхний.

Приводим результаты лабораторного обследования. Общий анализ крови: Hb - 70 г/л, Эр. - 2,72 х 10^{12}/л, ЦП - 0,8; СОЭ - 15 мм/ч, лейк. - 5,4 х 10^{9}/л, Э - 2%,

П - 4%, С - 54%, Л - 34%, М - 6%; общий анализ мочи - без патологии; кровь на серологическую реакцию Хеддельсона - резко положительная, р-я Райта - титр 1:400, биохимический анализ крови: креатинин - 134 мкмоль/л, мочевина - 8,9 ммоль/л, остаточный азот 27 ммоль\л. Свёртиваемость по Сухареву начало: 04:10; конец 04:57. Ликворограмма: спинномозговая жидкость бесцветная и прозрачная, реакция Нонне-Аппельта ++, Панди ++, белок - 1,70 г/л, цитоз - 750 кл в 1 мкл, нейтрофилы - 35%, лимфоциты - 65%;

Клинический диагноз: Основной: бруцеллёзный менингоэнцефалит сренетяжёлое течение.

Сопуствующий: Анемия тяжёлой степени тяжести.

Больному назначили следующую терапию. Streptomycini sulfatis 0,5 х 2 раза в\м, Tab. Doksicyclini 0,1 Х 2 раза внутрь; Ceftriaxone 1,0 х 2 раз в\в; Sol. Deksamethazoni по 4 мг 2 раза в сутки. Реосорбилакт 400,0 в\в капельно; Маннит 15,0 в\в капельно 2 раз в сутеи; Sol. Magnii sulfatis 25% - 5,0 , Sol. Natrii chloridi 0,9% - 100,0 в\в капельно 2 раз в сутки; Sol. Glucosae 5% - 200,0 , Sol. Acidi Ascorbini 5% - 4,0 в\в капельно.

Приведенный здесь случай не оставляет никакого сомнения в этиологии менингоэнцефалита. Диагноз основывается на данных эпидемиологического анамнеза, жалоб больной, клинической картины заболевания, лабораторных анализов и, в целом, положительного эффекта от лечения. Приведенный здесь случай подострого нейробруцеллеза проявлялся вялым и затяжным течением, со слабым симптомокомплексом поражения мягких мозговых оболочек и в целом соответствовал литературным описаниям менингоэнцефалита бруцеллезной этиологии.

Таким образом, диагноз бруцеллезный менингит нашел свое полное подтверждение. Окончательный клинический диагноз звучит так - бруцеллезный менингоэнцефалит, подострое течение. На 10-день терапии проводилась повторная спинномозговая пункция: СМЖ прозрачный, бесцветный, шла редкими каплями, реакция Панди +, общий белок 0,82 г/л, цитоз 8 кл/мкл, 100% лимфоциты.

Пациент выписан через 20 дней после стационарного лечения по причине клинического улучшения.

После проведенной терапии состояние пациента начало улучшатся. Температура тела начала нормализоваться через 5 дней. Сознание прояснился, головные боли постепенно уменьшились, вскоре исчезли. Менингеальные симптомы постепенно исчезли.

Заключение: В практике инфекционистов, особенно инфекционистов Самаркандской области, диагноз «нейробруцеллёз» не является большой

редкостью. Когда речь идет о нейробруцеллезе, то всегда подразумевается поражение периферической нервной системы по типу радикулита, плексита, полиневрита, полирадикулоневрита. А вот поражение ЦНС у современных больных бруцеллезом встречается исключительно редко. Данное обстоятельство явилось причиной написания статьи.

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ОСОБЕННОСТИ РАЗВИТИЯ МЕДИЦИНСКОГО ТУРИЗМА НА ЮГЕ УЗБЕКИСТАНА

Анатация: *В данной статье рассматриваются региональные аспекты медицинского туризма, одного из развивающихся секторов туризма, а также освещается история развития медицинского туризма, кроме того рассматриваются основные объекты медицинского туризма на юге Узбекистана, их специфические особенности и возможности развития.*

Ключевые слова: *Медицинский туризм, туризм, курорт, солённая пещера, родниковая вода, водохранилище, лечебные воды, оздоровление, курорты, природные лечебные ресурсы.*

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FEATURES OF THE DEVELOPMENT OF MEDICAL TOURISM IN THE SOUTH OF UZBEKISTAN

Abstract. *This article describes the regional aspects of medical tourism, one of the developing branches of tourism, and the history of the development of medical tourism, as well as the main objects of medical tourism in Southern Uzbekistan, their characteristics and development opportunities.*

Key words: *Medical tourism, tourism, recreation center, salt cave, spring water, reservoir, healing waters, treatment, resorts, natural healing resources.*

Узбекистан также играет значительную роль в мировом туризме, и на увеличение числа туристов, посещающих нашу страну, также влияют

гостеприимство, артистизм, уникальное мастерство и трудолюбие нашего народа. Однако из-за отсутствия рационального использования возможностей доля сектора в предоставлении услуг и экспорте значительно ниже среднего мирового показателя.

Согласно определениям медицинского туризма, данным американскими учеными М. Буклманом и К. Букманом, существуют две отрасли экономической деятельности, объединяющие путешествия с целью улучшения здоровья, а также продажу услуг: медицина и туризм [3].

В последние годы, как и во многих других сферах, в нашей стране уделяется большое внимание оказанию медицинских услуг населению. Из 100 целей, определяющих развитие нашей страны, 10 целей, предусматривают развитие системы медицинских услуг населению в Узбекистане [1]. Поэтому для многих узбекистанцев и иностранцев существует достаточно возможностей совмещать лечение и отдых. В частности, этот аспект актуален в Южном Узбекистане. В частности, в Постановлении Президента Республики Узбекистан от 23 сентября 2024 года №ПП-335 «О дополнительных мерах по дальнейшему развитию лечебно-оздоровительного туризма в Республике Узбекистан» [2] в нашей стране особое внимание уделяется полному и эффективному использованию потенциала лечебно-оздоровительного туризма, созданию кластеров лечебно-оздоровительного туризма и современных санаториев гостиничного типа, созданию системы дополнительной поддержки субъектов предпринимательства, осуществляющих данные виды деятельности, помимо Андижанской, Наманганской, Ферганской, Джизакской и Ташкентской областей, обоих регионов Южно-Узбекского экономического района, Кашкадарьинской и Сурхандарьинской областей.

Обычно туристы выбирают место отдыха по различным критериям: удобное географическое положение, наличие определенного вида услуг, транспортная доступность, условия размещения, выгодное соотношение цены и качества, уровень сервиса, чистый воздух, комфортный климат, красота природного ландшафта и т. д.

Южный Узбекистан богат природно-климатическими ресурсами, а факторами, развивающими лечебный туризм, являются соли, горячие источники, лечебные грязи, чистый воздух, различные лекарственные растения и т. д. Наряду с природными ресурсами выделяют и другие важные составляющие лечебного туризма. К ним относятся развитая инфраструктура, современные оздоровительные программы и методы лечения, квалифицированные кадры, которые могут развивать этот вид туризма.

Южный Узбекистан располагает собственными природно-рекреационными ресурсами с лечебно-оздоровительными факторами для качественной организации лечебно-оздоровительного туризма для туристов и комфортного отдыха туристов. В частности, в Шерабадском районе Сурхандарьинской области расположена соляная пещера, которая имеет 5 лечебных камер, отличающихся друг от друга температурой, влажностью,

давлением и микроклиматом. Стены пещеры уникально покрыты слоем соли от 1 см до 3 см, а у входа находится целебный источник с солевым раствором. Здесь могут поправить свое здоровье больные, страдающие бронхиальной астмой, сердечно-сосудистыми заболеваниями и заболеваниями нервной системы. Еще одно место, где можно подышать свежим воздухом — курорт Мираки, расположенный на высоте 1000 метров над уровнем моря в предгорьях Хисарских гор в Кашкадарьинской области, недалеко от рек Аксу и Карадарья и Хисаракского водохранилища.

Горные склоны в летние месяцы покрываются красочными растениями. Мед, собранный пчелами с этих растений, считается лекарством от 1000 различных заболеваний человеческого организма. [5]

В Сурхандарьинской области также есть целебные воды, которые могут лечить кожные заболевания, например, лечебный центр Ходжаипок в Алтынсайском районе области. Специалисты считают, что серосодержащая вода обладает способностью лечить кожные заболевания.

Еще одним лечебным учреждением региона является лечебный центр «Омонхона», расположенный в Байсунском районе. Вода источника «Омонхона» по своему составу и воздействию на организм человека является уникальной в Средней Азии. Основная основа лечения в бальнеологическом лечебном центре «Омонхона» — питье этой сульфидной минеральной воды и принятие ванн из нее. По словам специалистов, в родниковой воде, текущей с горы, содержится много полезных для организма элементов, таких как кремниевая кислота, железо, алюминий. С помощью этих полезных элементов организм человека растворяет камни, образовавшиеся в мочевыводящих путях и почках.

Некоторые районы южного региона нашей республики служат для восстановления здоровья населения своей прекрасной природой. Одним из таких мест является база отдыха «Сангардак», расположенная в ущелье Навруз Сараосийского района Сурхандарьинской области. База отдыха, которая возводится в уникальной горной среде, является идеальным местом для туристов, чтобы насладиться захватывающим видом на Гиссарские хребты, волнами реки Сангардак, уникальной природой, богатой кислородом, и восстановить свое здоровье.

Так, по данным источников Министерства экологии, охраны окружающей среды и изменения климата Республики Узбекистан, основным фактором его эффективного использования является формирование туристических объектов размещения и питания, транспортного обслуживания, а также сферы сервисного обслуживания в целом. В результате развития этих направлений необходимо провести следующие работы:

- Организация мероприятий, широко продвигающих потенциал медицинского туризма ведущих медицинских учреждений Южного Узбекистана в соседних странах и налаживание сотрудничества с субъектами предпринимательства в сфере туризма;

- проведение конференций государственными и частными медицинскими учреждениями региона;

Также определены необходимые задачи, такие как создание «гостеприимных услуг» и принятие мер по введению дополнительной (неэлектронной) въездной визы «Медицинская виза» в целях широкого привлечения иностранных туристов (пациентов и сопровождающих лиц) по направлению медицинского туризма. Это напрямую приведет к:

- Улучшится здоровье населения;
- За счет создания новых рабочих мест будет обеспечено занятостью население региона;
- Формируется туристическая инфраструктура и т.д.

В наше время общество не ограничено в выборе места отдыха, существует огромное количество различных вариантов по всему миру. Люди могут самостоятельно выбирать страну, город, размещение и набор дополнительных услуг, исходя из своих предпочтений и возможностей.

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ЭНЕРГИЯ САМАРАДОРЛИГИНИ ОШИРИШНИНГ ЗАМОНАВИЙ УСУЛЛАРИ

Аннотация: *Замонавий шароитларда электр энергетика тармоғида рақобат муҳитини ривожлантириш ва инвестицияларни жалб қилиш электр энергиясини ишлаб чиқариш ва етказиб бериш соҳасидаги фаолиятнинг институционал ва ташкилий-ҳуқуқий асосларини тубдан такомиллаштириш Ўзбекистон Республикаси Маъмурий ислоҳотлар концепциясида белгиланган вазифаларни бажариш мақсадларини белгилайди.*

Калит сўзлар: *Энергия тежаш, энергия самарадорлиги, энергетик тежамкорлик, ишончли фаолият, энергия сарфи, қайта тикланувчи энергия манбалари.*

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MODERN METHODS OF INCREASING ENERGY EFFICIENCY

Annotation: *It is known that in the republic, economic recovery, housing and population provision abound with long-term strategic prospects, and in Kazakhstan – energy resources - long-term needs, satisfaction of needs in the nodes of the oil and gas, electric power, chemical, chemical industries.*

Keywords: *energy saving, energy efficiency, energy saving, reliable activity, energy consumption, renewable energy sources.*

Ўзбекистон Республикаси Олий Мажлиси томонидан 2009 йил 30 сентябрда қабул қилинган “Электр энергетикаси тўғрисида”ги қонуннинг қабул қилиниши электр энергетикаси соҳасидаги муносабатларни тартибга солиш, Ўзбекистон Республикасининг электр энергетика хавфсизлигини таъминлаш, лектр энергиясини ҳосил қилиш, узатиш ва сотиш бўйича бошқарув ҳамда хўжалик алоқалари тизимига бозор принциплари ва механизмларини жорий этиш, электр энергетикасининг мутаносиб ривожланишини таъминлаш, электр энергиясидан ва ёқилғи-энергетика ресурсларидан оқилона фойдаланишга имкониятини беради.

Сўнгги йилларда мамлакатимизда, аввало, иқтисодиётнинг барча тармоқл арини ривожлантиришни жадаллаштириш,инвестицион жозибадорлик ва ишбилармонлик фаоллигини ошириш, ишлаб чиқариш ва хизмат кўрсатиш соҳасини кенгайтириш борасида кенг кўламли ислоҳотлар амалга ошириш ҳамда Ўзбекистон республикасида энергетикани ривожлантириш ва ундан оқилона фойдаланиш бўйича “Энергиядан оқилона

фойдаланиш тўғрисида”, “Электр энергетика тармоғини янада ривожлантириш ва ислоҳ қилиш стратегияси тўғрисида”,“Электр энергетикаси тўғрисида”, “Электр ва иссиқлик энергиясидан фойдаланиш қоидаларини тасдиқлаш тўғрисида”, “Қайта тикланувчи энергия манбаларидан фойдаланиш тўғрисида” ва бир нечта қонунлар қабул қилинди. Юқорида санаб ўтилган қонунлар ичида 1997 йил 25 апрелда қабул қилинган “Энергиядан оқилона фойдаланиш тўғрисида” ги қонун энергия ҳосил қиладиган ва энергия сарфлайдиган асбоб-ускуналар ҳамда маҳсулотга қонунчиликда назарда тутилган тартибда энергия жиҳатидан самарадорлик кўрсаткичларидан фойдаланиш ҳақидаги қонунлардан бири ҳисобланади. Ушбу қонуннинг мақсади миллий энергетика ресурслари сақланишини, энергиядан ва ишлаб чиқариш имкониятларидан самарали фойдаланишни таъминлайдиган умумий ҳуқуқий асосларни шакллантиришдан иборатдир.

Албатта, Ўзбекистон Республикасининг 1997 йил 25 апрелда қабул қилинган «Энергиядан оқилона фойдаланиш тўғрисида»ги 412-I-сонли Қонунига киритилган ўзгартиришлар Қонунчилик палатаси томонидан 2020 йил 1 майда қабул қилинган бўлиб, Сенат томонидан 2020 йил 19 июнда маъқулланган. Ўзбекистон Республикасининг Президенти Ш. Мирзиёев 2020 йил 14 июль санасида ушбу ўзгартиш ва қўшимчаларниЎРҚ-628-сон билан имзолади, Қонун расман эълон қилинди ва эълон қилинган кундан эътиборан кучга кирди. Хулоса ўрнида шуни алоҳида таъкидлаш жоизки, Ўзбекистон Республикаси Қонунига ўзгартиш ва қўшимчалар киритилганда: «энергиядан оқилона фойдаланиш», «энергияни тежаш ва энергия жиҳатидан самарадорликни ошириш», «давлат томонидан қўллаб-қувватлашни», «энергия жиҳатидан самарадор», «энергия тежаладиган дастурлар ва лойиҳаларни ишлаб чиқиш», «энергия жиҳатидан тежамкор техника ҳамда маҳсулот» «қайта тикланувчи энергия манбалари» каби муҳим жумлалар учрайдики, буларнинг барчаси Қонун энергетика соҳасининг ривожи, истеъмолчиларнинг ҳақ-ҳуқуқлари, Ўзбекистоннинг табиий бойликларидан оқилона фойдаланиш — энергия тежамкорлиги ва самарадорлиги нуқтаи назаридан бирмунча такомиллаштирилган.

Ушбу мақсадда Энергетика вазирлиги томонидан «Энергияни тежаш ва энергия самарадорлигини ошириш тўғрисидаги» қонун лойиҳаси ишлаб чиқилди ва норматив-ҳуқуқий ҳужжатлар лойиҳаларининг муҳокамаси порталида эълон қилинди. Лойиҳа 7 боб ва 24 моддадан иборат. У энергия тежаш ва энергия самарадорлиги объект ва субъектларига тавсиф берувчи, асосий атама ва тушунчаларни белгиловчи ҳамда энергетика нуқтаи назаридан муносабатларни расмийлаштирувчи янги бўлим ва моддаларни ўз ичига олган. Бундай қонун лойиҳада келтирилган моддалар албатта энергияни тежаш ва самарадорлигини ошириш учун мақсад қилинган.

Ўзбекистон Республикаси Олий Мажлиси томонидан 2019 йил 27 мартда қабул қилинган “Ўзбекистон Республикасида электр энергетика тармоғини янада ривожлантириш ва ислоҳ қилиш стратегияси тўғрисида” қонун Электр энергетика тармоғининг ишончли фаолият юритишини

таъминламасдан туриб иқтисодиёт тармоқлари ва мамлакат ҳудудларининг саноат салоҳиятини ошириш, тадбиркорлик фаолиятини ривожлантиришни рағбатлантириш, аҳоли фаровонлигини юксалтириш ва ҳаёт сифатини яхшилаш масалаларига бағишланган. Ушбу қонун замонавий шароитларда электр энергетика тармоғида рақобат муҳитини ривожлантириш ва инвестицияларни жалб қилиш электр энергиясини ишлаб чиқариш ва етказиб бериш соҳасидаги фаолиятнинг институционал ва ташкилий-ҳуқуқий асосларини тубдан такомиллаштириш, электр энергетика тармоғини ислоҳ қилиш бўйича вазифаларнинг амалий ижросини таъминлаш, шунингдек, 2017 — 2021 йилларда Ўзбекистон Республикасини ривожлантиришнинг бешта устувор йўналиши бўйича Ҳаракатлар стратегияси ва Ўзбекистон Республикаси Маъмурий ислоҳотлар концепциясида белгиланган вазифаларни бажариш мақсадларини белгилайди.

Маълумки, республикамизда иқтисодиёт барқарор ўсишини таъминлашга ва аҳолининг фаровонлик даражасини оширишга, ёқилғи-энергетика ресурсларига бўлган талаб – эҳтиёжни узлуксиз қаноатлантиришга қаратилган нефть – газ, электр энергетика, кўмир, кимё, қурилиш индустриясини ривожлантиришнинг узоқ муддатли стратегияси амалга оширилмоқда. Шу билан бирга, ёқилғи – энергетика тармоғининг мавжуд қувватлари энергия ресурсларига ортиб бораётган талаб-эҳтиёжни тўлиқ даражада таъминламаяпти, мамлакатимиз иқтисодиётининг энергия сарфи ҳажми ривожланган мамлакатларнинг ўртача кўрсаткичидан анча юқоридир. Ҳозирги вақтда асосан гидроэлектростанциялар ишлаб чиқараётган қайта тикланувчи энергия манбалари ҳиссасига мамлакатда ишлаб чиқарилаётган электр энергияси умумий ҳажмининг атиги ўн фоизи тўғри келмоқда. Ниҳоятда катта салоҳият мавжуд бўлишига қарамасдан, қуёш ва шамол сингари қайта тикланувчи энергия манбаларининг имкониятларидан тўлиқ даражада фойдаланилмаяпти. Шу муносабат билан, иқтисодиёт тармоқлари ва ижтимоий соҳанинг энергия самарадорлигини ошириш, энергия тежовчи технологиялар ва қайта тикланувчи энергия манбаларини кенг жорий этиш давлат сиёсатининг ҳозирги босқичдаги долзарб йўналишларидан бири бўлиб қолиши лозим.

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БИОМАССА ЭНЕРГИЯСИНИ ЭЛЕКТР ВА ИССИҚЛИК ЭНЕРГИЯСИГА АЙЛАНТИРИШ

Аннотация: *Юқори намлик (чиқинди сув, маиший чиқиндилар, органик қолдиқларни гидролизлаш маҳсулотлари) бўлган биомасса биологик жараёнлар билан қайта ишланади: анаероб ҳазм қилиш ва ферментация. Ушбу жараёнлар натижасида биогаз (метан ва карбонат ангидрид), органик кислоталар, спиртлар ва асетон олинади.*

Калит сўзлар: *Энергия тежаш, энергия самарадорлиги, энергетик тежамкорлик, ишончли фаолият, энергия сарфи, қайта тикланувчи энергия манбалари.*

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CONVERTING BIOMASS ENERGY INTO ELECTRIC AND HEAT ENERGY

Annatation: *Biomass with high humidity (waste water, household waste, organic residue hydrolysis products) is processed by biological processes: anaerobic digestion and fermentation. As a result of these processes, biogas (methane and carbon dioxide), organic acids, alcohols and acetone are obtained.*

Keywords: *energy saving, energy efficiency, energy saving, reliable activity, energy consumption, renewable energy sources.*

Биоэнергия - бу "биомасса энергияси, биогаз ва биомассани қайта ишлаш маҳсулотларини бошқа энергия турларига айлантириш."

Биомасса ердаги қайта тикланадиган энергиянинг енг истиқболли манбаларидан биридир. Бу ҳақиқатга биомассанинг муҳим энергия салоҳияти ва бу энергия манбасининг нисбатан оддий янгиланиши каби ўзига хос хусусиятлари ёрдам беради. Бундан ташқари, ушбу турдаги ёқилғини ишлаб чиқариш ва улардан фойдаланиш катта молиявий инвестицияларни талаб қилмайди.

"Биомасса" атамаси ўсимлик ва ҳайвонот манбаларидан барча қайта ишланадиган органик моддаларни бирлаштиради. Биомасса бирламчи (ўсимликлар ,ҳайвонлар, микроорганизмлар ва бошқаларга бўлинади.) ва иккиламчи (бирламчи биомасса ва одамлар ва ҳайвонларнинг чиқиндиларини қайта ишлаш чиқиндилари). Биоёқилғининг уч тури мавжуд: суюқ (етанол, метанол, биодизел), қаттиқ (ўтин, сомон) ва газсимон (биогаз, водород).

Биомассадан энергия ишлаб чиқариш дунёнинг кўплаб мамлакатларида

енг жадал ривожланаётган тармоқлардан биридир.

Намликка қараб, биомасса термокимёвий ёки биологик усуллар билан қайта ишланади. Намлиги паст бўлган биомасса (қишлоқ хўжалиги ва шаҳар қаттиқ чиқиндилари) термокимёвий жараёнлар билан қайта ишланади: тўғридан-тўғри ёниш, пиролиз (термал парчаланиш), суюлтириш, гидролиз. Натижада сув буғлари, електр энергияси, ёқилғи гази, водород, суюқ ёқилғи, кўмир, глюкоза олинади. Юқори намлик (чиқинди сув, маиший чиқиндилар, органик қолдиқларни гидролизлаш маҳсулотлари) бўлган биомасса биологик жараёнлар билан қайта ишланади: анаероб ҳазм қилиш ва ферментация. Ушбу жараёнлар натижасида биогаз (метан ва карбонат ангидрид), органик кислоталар, спиртлар ва асетон олинади.

Биомассадан энергиядан фойдаланишнинг енг истиқболли йўналишларидан бири ундан биогаз ишлаб чиқаришдир. Биогаз қурилмалари ва қурилмалари Россиянинг исталган минтақаларида куннинг исталган вақтида, органик чиқиндилар ва энергия биомассаси мавжуд бўлган деярли ҳамма жойда ишлаши мумкин.

Гўнгдан биогазни енг самарали ишлаб чиқариш. Унинг бир тоннасидан 10-12 м3 метан олиш мумкин. Дала деҳқончилигидан 100 million тонна донли сомон каби чиқиндиларни қайта ишлаш 20 миллиардга яқин маблағни бериши мумкин. м3 метан. Пахта етиштириладиган ҳудудларда йилига 8-9 million тонна пахта пояси қолади, ундан 2 миллиардгача пахта олиш мумкин. м3 метан. Худди шу мақсадлар учун маданий ўсимликлар ва ўтларнинг тепаларини йўқ қилиш мумкин.

Россияда ҳар йили Халқ хўжалигининг турли соҳаларида 300 million тоннагача (қуруқ моддалар) ишлаб чиқарилади, шундан: қишлоқ хўжалигида 230 million тонна – чорвачилик ва паррандачиликда 130 million тонна ва ўсимликчиликда 100 million тонна; шаҳарларда – 70 million тонна: 60 million тонна қишлоқ хўжалиги ишлаб чиқаришида. қаттиқ маиший чиқиндилар ва 10 million тонна канализация лойи. Белгиланган миқдордаги чиқиндиларнинг энергия салоҳияти 190 million тонна кубни ташкил қилади.t., ҳақиқатан ҳам 45 million тоннагача су олиш мумкин.t. йилига. Бу салоҳият ҳали ҳам тўлиқ етарли даражада ишлатилмаяпти. Қаттиқ чиқиндиларни қайта ишлаш бўйича ягона тажриба заводлари мавжуд бўлиб, уларнинг експлуатацион хусусиятлари кенг саноат мақсадларида фойдаланиш учун қониқарли деб ҳисобланмайди. Бу борада ҳали кўп ишлар қилиниши керак.

Биомассадан энергия олиш технологияларидан фойдаланиш учун энергия ишлаб чиқаришнинг хом ашё манбасига яқинлиги зарур ("ноанъанавий биомасса" учун бу қишлоқ хўжалиги корхоналари, фермер хўжаликлари), бу сизга нисбатан арзон энергиянинг мақбул миқдорини олиш имконини беради. Россияда чернозем вилояти, Krasnodar ўлкаси, Марказий Россия ва Жанубий Сибирда биомассадан энергия ишлаб чиқаришни ташкил етиш мақсадга мувофиқдир.

Геотермик энергия - бу " геотермик сувларнинг энергиясини бошқа энергия турларига айлантириш."Геотермал манбалар деярли

битмас-туганмас ва олинган энергия миқдори бўйича юқори даражада башорат қилиш қобилиятига ега.

Халқаро енергетика агентлиги таснифига кўра геотермал энергия манбалари 5 турга бўлинади :

1. геотермик қуруқ буг ъ конлари;
2. нам буг ъ манбалари (иссиқ сув ва буг ъ аралашмалари);
3. геотермик сув конлари (иссиқ сув ёки буг ъ ва сувни ўз ичига олади);
4. magma билан иситиладиган қуруқ иссиқ тошлар;
5. magma, қайси ериган жинслар ҳисобланади.

Сув, буг ёки уларнинг аралашмасининг ҳароратига қараб, геотермик манбалар паст ҳароратли ва ўрта ҳароратга (130-150 гача) ва юқори ҳароратга (150 дан ортиқ) бўлинади. Геотермик манбанинг ҳарорати асосан уни ишлатиш хусусиятини белгилайди.

Геотермал энергиядан фойдаланиш бир қатор аниқ афзалликларга ега:

1. ушбу турдаги энергия захиралари деярли тугамайди;
2. геотермик энергия жуда кенг тарқалган;
3. геотермал энергиядан фойдаланиш катта харажатларни талаб қилмайди.

Бироқ, шу билан бирга, геотермал энергия иккита муҳим камчиликка ега:

1. унинг манбасида геотермал энергиянинг заиф концентрацияси;
2. буг заҳарли газларни ўз ичига олади ва сув олтингугурт ва бошқа аралашмаларни ташийди.

Россияда геотермал энергия потенциал фойдаланиш бўйича биринчи ўринда туради. Россияда ушбу турдаги энергиянинг умумий захиралари 2000 Мвт га баҳоланмоқда. Геотермал энергиянинг иқтисодий салоҳияти йилига 115 million тоннани ташкил этади.

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ЕВРОПА ДАВЛАТЛАРИДА ҚАЙТА ТИКЛАНУВЧИ ЭНЕРГИЯ МАНБАЛАРИДАН ФОЙДАЛАНИШ ТАЖРИБАСИ

Аннотация: *Испанияда давлат иштирокида олтита йирик қуёш електр станцияларини қуриш режалаштирилган бўлиб, улар яратилаётган умумевропа електр енергиясини тақсимлаш тизими шароитида електр енергиясини бошқа минтақалар билан бўлишиш имкониятига ега бўлади. Дания ва Германия иштирокидаги шамол стансиялари учун ҳам худди шундай енергия ресурсларини қайта тақсимлаш режалаштирилган.*

Калит сўзлар: *Энергия тежаш, энергия самарадорлиги, энергетик тежамкорлик, ишончли фаолият, энергия сарфи, қайта тикланувчи энергия манбалари.*

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EXPERIENCE OF USING RENEWABLE ENERGY SOURCES IN EUROPEAN COUNTRIES

Annotation: *In Spain, it is planned to build six large solar vest stations with the participation of the state, which will be able to share the vest sleeve with other regions under the conditions of the all-European vest sleeve distribution system being created. A similar redistribution of yenergy resources is planned for wind farms with Danish and German participation.*

Keywords: *energy saving, energy efficiency, energy saving, reliable activity, energy consumption, renewable energy sources.*

Европа ва Ақшда муқобил ва қайта тикланадиган енергия соҳасидаги вазият бошқа сценарий бўйича ривожланди. 1973 йилдаги жаҳон нефт инқирози муқобил қайта тикланадиган енергия манбаларига қизиқишни кучайтирди. 1974 йил давомида нефт нархи тўрт баравар ошди ва Ғарб мамлакатлари инқироз сабабларини тушуниб, муқобил енергия соҳасида тадқиқотларни бошладилар, уларнинг стратегик мақсади миллий енергия хавфсизлигини таъминлаш еди. Олимларнинг иши ҳар хил турдаги муқобил манбалар устида олиб борилди, ягона аниқ чекловчи омил маълум ҳудудларнинг табиий-иқлим шароити еди.

“Независимая Газета” томонидан келтирилган маълумотларга кўра, дунёда қайта тикланадиган енергия манбаларининг (шу жумладан кичик гидроенергетиканинг) улуши 30 йил ичида кўп ўсмаган: 13,3 йилда 1970% дан 13,6 йилда 2000% гача. Муқобил қайта тикланадиган енергия манбаларига

инвестициялар фақат 2000-йилларнинг ўрталарида кўп марта ошди: 33,4 йилда 2004 миллиард доллардан 148,4 йилда 2007 миллиард долларгача. 2007 йилдан бери Google шамол ва қуёш энергиясига фаол сармоя киритмоқда. 2007 йилда муқобил энергия соҳасидаги хорижий лойиҳаларнинг рентабеллиги ўртача 10-20% га баҳоланди, аммо яқин келажакда сезиларли ўсиш потенциалига ега. 2009 йилда техника фанлари доктори Олег Попелнинг сўзларига кўра, global енергия балансида муқобил РЕС улуши 5%, шамол енергиясининг ўсиш суръати йилига 30%, қуёш енергияси еса йилига 50% ни ташкил етди.

2010 Йил охирида ноанъанавий енергия ишлаб чиқариш бўйича етакчи мамлакатлар Исландия (енергия балансидаги Реснинг тахминан 25%, асосий РЕС геотермал енергия), Дания (енергия балансидаги Реснинг тахминан 20,6%, асосий РЕС шамол енергияси), Португалия (18% енергия балансидаги РЕС, асосий РЕС-тўлқин енергияси, қуёш енергияси ва шамол), Испания (енергия балансидаги Реснинг 17,7%, асосий РЕС-қуёш енергияси) ва янги Зеландия (енергия балансидаги Реснинг 15,1%, асосий РЕС-геотермик ва шамол енергияси). Бундан ташқари, Ватикан, Хитой ва Ҳиндистон 2010 йилда муқобил енергетикани ривожлантиришга фаол сармоя киритди. 2010 йилда Ватиканда Европадаги енг йирик қуёш електр станциясининг қурилиши якунланди, бу бошқа енергия манбаларидан фойдаланишни деярли бутунлай тарк етишга имкон беради. Ҳиндистоннинг режаларига қуёш енергиясини кенг миқёсда ривожлантириш ҳам киритилган. 2011 йил охирига келиб Гужаратда 1000 Мвт қувватга ега қуёш електр станциясининг қурилиши якунланди. Хитой шамол енергиясини ривожлантириш лойиҳаларини фаол молиялаштиради. 2010 йилда Хитой ишлаб чиқарилган шамол енергияси бўйича дунёда Ақшдан кейин иккинчи ўринни егаллаб, Германияни ортда қолдирди.

ХХИ аср бошидан бери чет елда муқобил енергия инвестицияларнинг яна бир тўлқинини олди. Европа Иттифоқи АЕ ёрдамида умумевропа електр енергиясини тақсимлаш тизимини яратишни бошлади, Қўшма Штатлар енергия балансидаги муқобил енергия манбалари улушини 20 йилга келиб 2020% гача ошириш режаларини еълон қилди. Европа Иттифоқи, шунингдек, енергия балансидаги муқобил енергия манбаларининг улушини 20 йилга келиб 2020 фоизга ва 40 йилда 2040 фоизга оширишни режалаштирмоқда. Хусусан, Испанияда давлат иштирокида олтита йирик қуёш електр станцияларини қуриш режалаштирилган бўлиб, улар яратилаётган умумевропа електр енергиясини тақсимлаш тизими шароитида електр енергиясини бошқа минтақалар билан бўлишиш имкониятига ега бўлади. Дания ва Германия иштирокидаги шамол стансиялари учун ҳам худди шундай енергия ресурсларини қайта тақсимлаш режалаштирилган.

Маълумки, республикамизда иқтисодиёт барқарор ўсишини таъминлашга ва аҳолининг фаровонлик даражасини оширишга, ёқилғи-энергетика ресурсларига бўлган талаб – эҳтиёжни узлуксиз қаноатлантиришга қаратилган нефть – газ, електр энергетика, кўмир,

кимё, қурилиш индустриясини ривожлантиришнинг узоқ муддатли стратегияси амалга оширилмоқда. Шу билан бирга, ёқилғи – энергетика тармоғининг мавжуд қувватлари энергия ресурсларига ортиб бораётган талаб-эҳтиёжни тўлиқ даражада таъминламаяпти, мамлакатимиз иқтисодиётининг энергия сарфи ҳажми ривожланган мамлакатларнинг ўртача кўрсаткичидан анча юқоридир. Ҳозирги вақтда асосан гидроэлектростанциялар ишлаб чиқараётган қайта тикланувчи энергия манбалари ҳиссасига мамлакатда ишлаб чиқарилаётган электр энергияси умумий ҳажмининг атиги ўн фоизи тўғри келмоқда. Ниҳоятда катта салоҳият мавжуд бўлишига қарамасдан, қуёш ва шамол сингари қайта тикланувчи энергия манбаларининг имкониятларидан тўлиқ даражада фойдаланилмаяпти. Шу муносабат билан, иқтисодиёт тармоқлари ва ижтимоий соҳанинг энергия самарадорлигини ошириш, энергия тежовчи технологиялар ва қайта тикланувчи энергия манбаларини кенг жорий этиш давлат сиёсатининг ҳозирги босқичдаги долзарб йўналишларидан бири бўлиб қолиши лозим.

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ҚАЙТА ТИКЛАНУВЧИ ЭНЕРГИЯ МАНБАЛАРИНИНГ ТУРЛАРИ ВА УЛАРНИНГ ИҚТИСОДИЙ САМАРАДОРЛИГИ

Аннотация: *Муқобил манбалардан фойдаланиш бўйича ишланмалар илгари амалга оширилган бўлса-да, global миқёсда муқобил енергиянинг фаол ривожланиши 1973 йилги нефт инқирозидан сўнг, инсоният қайта тикланмайдиган енергия манбаларига ва уларнинг нархларига қабул қилиб бўлмайдиган даражада юқори даражада боғлиқлигини англаганидан кейин бошланди.*

Калит сўзлар: *Энергия тежаш, энергия самарадорлиги, энергетик тежамкорлик, ишончли фаолият, энергия сарфи, қайта тикланувчи энергия манбалари.*

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TYPES OF RENEWABLE ENERGY SOURCES AND THEIR ECONOMIC EFFICIENCY

Annotation: *It is known that in the republic, economic recovery, housing and population provision abound with long-term strategic prospects, and in Kazakhstan – energy resources - long-term needs, satisfaction of needs in the nodes of the oil and gas, electric power, chemical, chemical industries.*

Keywords: *energy saving, energy efficiency, energy saving, reliable activity, energy consumption, renewable energy sources.*

Қайта тикланадиган енергия манбалари — қуёш енергияси, шамол енергияси, сув енергияси (шу жумладан оқава сув енергияси), бундай енергиядан гидроелектростанцияларда фойдаланиш бундан мустасно, сув ҳавзаларининг тўлқин енергияси, шу жумладан сув омборлари, дарёлар, денгизлар, океанлар, табиий ер ости иссиқлик ташувчиларидан фойдаланган ҳолда геотермик енергия, паст потенциал ернинг иссиқлик енергияси, ҳаво, махсус иссиқлик ташувчилар, биомассадан фойдаланган ҳолда сув, енергия ишлаб чиқариш учун махсус ўстирилган ўсимликлар, шу жумладан дарахтлар, шунингдек ишлаб чиқариш ва истеъмол чиқиндилари киради, углеводород хом ашёси ва ёқилғидан фойдаланиш пайтида олинган чиқиндилар бундан мустасно, биогаз, бундай чиқиндиларнинг чиқиндихоналарида ишлаб чиқариш ва истеъмол чиқиндилари натижасида чиқарилган газ, кўмир конларида ҳосил бўлган газ."

Қайта тикланадиган енергия манбаларини яна иккита гуруҳга бўлиш

мумкин — анъанавий ва ноанъанавий (муқобил) енергия манбалари. Гидроенергетика ва ёғоч чиқиндиларини ёқилғи сифатида ишлатадиган биоенергия бўлими анъанавий енергия манбалари ҳисобланади. Муқобил енергия манбаларига қуйидагилар киради: геотермик, қуёш, шамол ва тўлқин енергияси, шунингдек кичик гидроенергетика ва биомасса енергиясининг анъанавий енергия манбаларига тегишли бўлмаган қисми.

Муқобил манбалардан фойдаланиш бўйича ишланмалар илгари амалга оширилган бўлса-да, global миқёсда муқобил енергиянинг фаол ривожланиши 1973 йилги нефт инқирозидан сўнг, инсоният қайта тикланмайдиган енергия манбаларига ва уларнинг нархларига қабул қилиб бўлмайдиган даражада юқори даражада боғлиқлигини англаганидан кейин бошланди. Нефт ва газ қабулхонасининг фаол қаршиликларига қарамай, замонавий дунёда муқобил енергия манбаларидан фойдаланиш ҳам иқтисодий, ҳам енергия самарадорлиги нуқтаи назаридан истиқболли ҳисобланади.

Сўнгги йилларда рўй берган, давлатлар ва минтақаларнинг енергия хавфсизлигига потенциал таъсир кўрсатадиган сиёсий, иқтисодий ва екологик инқирозлар муқобил енергетикани ривожлантириш учун қўшимча рағбат бўлиб хизмат қилди. Бундай инқироз Ақш террористик ҳужумлар ўз ичига олади (2001), Москва електр ҳодиса (2005), Европа Иттифоқи мамлакатлари учун Украина орқали газ транзит узилишлар (2009), Япония Fukushima—1 атом стансиясида ҳодиса (2011), шунингдек бошқа шунга ўхшаш воқеалар сифатида. Бундай ҳодисалардан сўнг, инсоният қайта тикланмайдиган енергия манбаларига қабул қилиб бўлмайдиган даражада юқори даражада қарамлигини, шунингдек, уларнинг баъзиларининг хавфлилигини тобора кўпроқ англамоқда.

Федерацияси Россия муқобил енергия соҳасида катта имкониятларга ега. Мамлакатимизнинг деярли ҳар бир минтақасида қайта тикланадиган енергия манбаларидан (РЕС) фойдаланиш имконияти мавжуд. Ва бу йўналишдаги баъзи тадқиқотлар ва ишланмалар 1950-1960 йилларда фаол олиб борилган бўлса-да, Россияда муқобил енергетиканинг фаол ривожланиши фақат 2000-йилларда бошланган.

Айни пайтда Россия қайта тикланадиган ва муқобил енергия манбаларининг деярли барча маълум турларидан фойдаланган ҳолда електр станцияларини яратиш бўйича муваффақиятли тажрибага ега. Асосий муаммо-2000-йилларнинг охирида бир қатор fundamental қарорлар қабул қилинганига қарамай, муқобил енергияни Реал давлат томонидан қўллаб-қувватлашнинг йўқлиги.

Ушбу қонун замонавий шароитларда електр енергетика тармоғида рақобат муҳитини ривожлантириш ва инвестицияларни жалб қилиш електр енергиясини ишлаб чиқариш ва етказиб бериш соҳасидаги фаолиятнинг институционал ва ташкилий-ҳуқуқий асосларини тубдан такомиллаштириш, електр енергетика тармоғини ислоҳ қилиш бўйича вазифаларнинг амалий ижросини таъминлаш, шунингдек, 2017 — 2021 йилларда Ўзбекистон Республикасини ривожлантиришнинг бешта устувор йўналиши бўйича

Ҳаракатлар стратегияси ва Ўзбекистон Республикаси Маъмурий ислоҳотлар концепциясида белгиланган вазифаларни бажариш мақсадларини белгилайди.

Маълумки, республикамизда иқтисодиёт барқарор ўсишини таъминлашга ва аҳолининг фаровонлик даражасини оширишга, ёқилғи-энергетика ресурсларига бўлган талаб – эҳтиёжни узлуксиз қаноатлантиришга қаратилган нефть – газ, электр энергетика, кўмир, кимё, қурилиш индустриясини ривожлантиришнинг узоқ муддатли стратегияси амалга оширилмоқда. Шу билан бирга, ёқилғи – энергетика тармоғининг мавжуд қувватлари энергия ресурсларига ортиб бораётган талаб-эҳтиёжни тўлиқ даражада таъминламаяпти, мамлакатимиз иқтисодиётининг энергия сарфи ҳажми ривожланган мамлакатларнинг ўртача кўрсаткичидан анча юқоридир. Ҳозирги вақтда асосан гидроэлектростанциялар ишлаб чиқараётган қайта тикланувчи энергия манбалари ҳиссасига мамлакатда ишлаб чиқарилаётган электр энергияси умумий ҳажмининг атиги ўн фоизи тўғри келмоқда. Ниҳоятда катта салоҳият мавжуд бўлишига қарамасдан, қуёш ва шамол сингари қайта тикланувчи энергия манбаларининг имкониятларидан тўлиқ даражада фойдаланилмаяпти. Шу муносабат билан, иқтисодиёт тармоқлари ва ижтимоий соҳанинг энергия самарадорлигини ошириш, энергия тежовчи технологиялар ва қайта тикланувчи энергия манбаларини кенг жорий этиш давлат сиёсатининг ҳозирги босқичдаги долзарб йўналишларидан бири бўлиб қолиши лозим.

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МУҚОБИЛ ЭНЕРГИЯ МАНБАЛАРИНИНГ ТУРЛАРИ ВА УЛАРДАН ҚИШЛОҚ ХЎЖАЛИГИДА ФОЙДАЛАНИШ

Аннотация: *Дунёда энг кенг тарқалгани учта пичоқли ва горизонтал айланиш ўқига ега шамол турбиналарининг дизайни. Бундан ташқари, вертикал айланиш ўқи бўлган шамол турбиналарини қуришга уринишлар қилинган, чунки улар ишлашни бошлаш учун жуда паст шамол тезлигини талаб қиладиган афзалликларга ега деб ишонилади.*

Калит сўзлар: *Энергия тежаш, энергия самарадорлиги, энергетик тежамкорлик, ишончли фаолият, энергия сарфи, қайта тикланувчи энергия манбалари.*

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TYPES OF ALTERNATIVE ENERGY SOURCES AND THEIR USE IN AGRICULTURE

Abstract: *The most common in the world is the design of yega wind turbines with three blades and a horizontal axis of rotation. In addition, attempts have been made to build wind turbines with a vertical axis of rotation, as it is believed that they will eat up the advantages that require a very low wind speed to start working.*

Keywords: *energy saving, energy efficiency, energy saving, reliable activity, energy consumption, renewable energy sources.*

Шамол ер юзасининг қуёш нурлари ва атмосферанинг пастки қатламлари томонидан нотекис исиши натижасида ҳосил бўлади-ҳаво массалари ер юзасига ва ундан юқорига, ердан 7-12 км баландликда ҳаракатлана бошлайди. Шундай қилиб, шамол энергияси қуёш фаолиятининг натижасидир. Шамол турбиналарини жойлаштириш учун енг фойдали жойлар — шамол энергиясини конвертация қилиш учун тузилмалар — қирғоқ чизиқлари (қирғоқдан камида 10-12 км), ҳароратнинг пасайиши ва кучли ва барқарор шамол (камида 5 м/ с).

Дунёда энг кенг тарқалгани учта пичоқли ва горизонтал айланиш ўқига ега шамол турбиналарининг дизайни. Бундан ташқари, вертикал айланиш ўқи бўлган шамол турбиналарини қуришга уринишлар қилинган, чунки улар ишлашни бошлаш учун жуда паст шамол тезлигини талаб қиладиган афзалликларга ега деб ишонилади. Бироқ, тормоз механизми билан боғлиқ муаммолар туфайли бундай шамол генераторлари шамол енергетикаси саноатида амалий тақсимланмаган.

Шамол ёрдамида електр энергиясини ишлаб чиқариш бир қатор афзалликларга ега:

1. зарарли чиқиндиларсиз екологик тоза ишлаб чиқариш;
2. мавжудлиги;
3. амалий битмас-туганмаслик.

Бироқ, шамол энергияси бир қатор камчиликларга ега:

1. нотекис энергия чиқиши;
2. энергияни сақлаш зарурати;
3. шовқиннинг ифлосланиши ва телевизор сигналини қабул қилиш учун шовқин мавжудлиги;
4. қушлар ва ҳашаротларнинг учишига аралашиш;
5. шамол турбиналарининг юқори нархи;
6. батареяларни ўрнатиш учун катта майдонларга ехтиёж.

Россиянинг умумий шамол салоҳияти 26000 млн.t., техник салоҳияти 2000 млн.t. ва иқтисодий салоҳияти 10 млн.t.

Шамол энергиясининг салоҳияти Россия ҳудудида нотекис тақсимланган. 2-иловада келтирилган Россия Федерациясининг шамол ресурслари харитасида шамол энергияси манбаларининг ер сатҳидан 50 метр баландликда жойлашганлиги кўрсатилган. Ушбу харитага кўра, шамолнинг ўртача тезлиги Barents, Кара, Bering ва Охоцк денгизлари бўйлаб тўпланган. Шамол тезлиги нисбатан юқори бўлган ҳудудларга (5-6 м/с) шимолда Шарқий Сибир, Чукчи ва Лаптев денгизлари ва Шарқда Япония денгизи қирғоқлари киради. Ўрта ва қуйи Volga минтақаларида, Уралсда, Ғарбий Сибирнинг дашт минтақаларида ва Байкал кўлида ҳам муҳим манбалар мавжуд.

Россиянинг аксарият ҳудудларида кундузи шамол тезлиги тунга қараганда юқори ва бу фарқлар қишда камроқ сезилади. Россиянинг аксарият минтақаларида ўртача шамол тезлигининг йиллик йўналиши аҳамияциз ва 1 дан 4 м/с гача ўзгариб туради, ўртача 2-3 м/с. юқори амплитудалар

Россиянинг Европа қисмининг марказида, Шарқий ва Ғарбий Сибирда, шунингдек узоқ Шарқда кузатилади. улар 4 м/с га етади. Россиянинг Европа қисмининг жануби-Шарқий ва жануби-ғарбий қисмида ва Марказий Сибирда йиллик 2 м/с дан кам амплитудалар кузатилади.

Тўлқинли гидроенергетика - тўлқинлар энергиясини бошқа энергия турларига айлантириш.

Гелгит електр станциялари (ИЕС) юқори оқим ва паст оқим пайтида сув сатҳининг максимал фарқлари билан қирғоқларда жойлашган. Песнинг ишлаш принципи қуйидагича: кўрфазда унинг бир қисмини океандан ажратиб турадиган тўғон қурилмоқда. Юқори оқим ва паст оқим пайтида тўғоннинг турли томонларида сув сатҳининг пасайиши ҳосил бўлади, сув тўғон орқали пастки сатҳга қараб оқади ва бир йўналишда (юқори оқимда),

сўнгра бошқа томонда (паст оқимда) айланадиган тескари турбиналарни ҳаракатга келтиради.

Тўлқинли електр станцияларини қуришдан иқтисодий фойдаларни баҳолашда шуни ёдда тутиш керакки, тўлқинлар пайтида сув сатҳининг енг

кучли тебранишлари чекка денгизларга хосдир. Ушбу қирғоқларнинг аксарияти кам аҳоли яшайдиган жойларда жойлашган бўлиб, иқтисодий фаолият ва електр энергиясини оммавий истеъмол қилиш жойларидан сезиларли даражада олиб ташланган. Бундан ташқари, у ҳисобга йил фасллари електр стансиялари чиқимларни қоплаш анча жозибадор сезиларли уларнинг қуввати ортади сифатида бўлади, деб ҳақиқатни олиш зарур 5 ва яна ҳам шундай учун 15 million квт. Бироқ, мамлакатнинг чекка ҳудудларида бундай миқёсдаги тўлқин станцияларини қуриш жуда кўп пул талаб қилади ва ҳар доим ҳам тавсия етилмайди.

Маълумки, республикамизда иқтисодиёт барқарор ўсишини таъминлашга ва аҳолининг фаровонлик даражасини оширишга, ёқилғи-энергетика ресурсларига бўлган талаб – эҳтиёжни узлуксиз қаноатлантиришга қаратилган нефть – газ, електр энергетика, кўмир, кимё, қурилиш индустриясини ривожлантиришнинг узоқ муддатли стратегияси амалга оширилмоқда. Шу билан бирга, ёқилғи – энергетика тармоғининг мавжуд қувватлари энергия ресурсларига ортиб бораётган талаб-эҳтиёжни тўлиқ даражада таъминламаяпти, мамлакатимиз иқтисодиётининг энергия сарфи ҳажми ривожланган мамлакатларнинг ўртача кўрсаткичидан анча юқоридир. Ҳозирги вақтда асосан гидроэлектростанциялар ишлаб чиқараётган қайта тикланувчи энергия манбалари ҳиссасига мамлакатда ишлаб чиқарилаётган електр энергияси умумий ҳажмининг атиги ўн фоизи тўғри келмоқда. Ниҳоятда катта салоҳият мавжуд бўлишига қарамасдан, қуёш ва шамол сингари қайта тикланувчи энергия манбаларининг имкониятларидан тўлиқ даражада фойдаланилмаяпти.

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БИОИНДИКАТОРНАЯ РОЛЬ ДОЖДЕВЫХ ЧЕРВЕЙ В АГРОЭКОСИСТЕМАХ РЕСПУБЛИКИ КАРАКАЛПАКСТАН

Аннотация: *В статье рассматривается значение дождевых червей как биоиндикаторов состояния агроэкосистем в условиях Республики Каракалпакстан. Проведены полевые и лабораторные исследования, направленные на выявление видового состава, численности и биомассы дождевых червей на различных сельскохозяйственных угодьях региона. Особое внимание уделено их реакции на агрохимические нагрузки, степень засоленности и другие антропогенные факторы.*

Ключевые слова: *агрохимия, численность, угодья, регион, почва, агрегат, деструкция.*

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BIOINDICATOR ROLE OF EARTHWORMS IN AGROECOSYSTEMS OF THE REPUBLIC OF KARAKALPAKSTAN

Abstract: *The article discusses the importance of earthworms as bioindicators of the state of agroecosystems in the Republic of Karakalpakstan. Field and laboratory studies were conducted to identify the species composition, abundance and biomass of earthworms on various agricultural lands in the region. Particular attention was paid to their response to agrochemical loads, salinity and other anthropogenic factors.*

Key words*: agrochemistry, abundance, lands, region, soil, aggregate, destruction.*

Введение

Дождевые черви (Lumbricidae) являются ключевыми компонентами почвенных экосистем, играя важную роль в формировании плодородия почв, деструкции органического вещества, круговороте питательных веществ и улучшении водного и воздушного режимов почвы. Их активность напрямую влияет на структуру, пористость и стабильность почвенного агрегата. В силу

своей чувствительности к изменениям в почвенной среде, дождевые черви широко признаны в качестве биоиндикаторов состояния и качества почв. Изменение их численности, биомассы, видового состава и физиологического состояния может служить ранним сигналом деградации почв, загрязнения или нарушения экологического равновесия.

Агроэкосистемы Республики Каракалпакстан, расположенной в аридной зоне Средней Азии, подвержены значительной антропогенной нагрузке, включая интенсивное земледелие, ирригацию, использование агрохимикатов и последствия изменения климата, такие как опустынивание и засоление. Эти факторы оказывают существенное воздействие на биоту почв, в том числе на популяции дождевых червей. В условиях дефицита влаги и высоких температур, характерных для региона, роль дождевых червей в поддержании устойчивости и продуктивности агроэкосистем становится особенно важной.

Данная статья направлена на изучение биоиндикаторной роли дождевых червей в агроэкосистемах Республики Каракалпакстан с целью оценки их потенциала в мониторинге почвенного здоровья и устойчивости сельскохозяйственного производства в условиях аридного климата и антропогенного воздействия.

Материалы и методы

Для оценки биоиндикаторной роли дождевых червей были выбраны репрезентативные агроэкосистемы в различных районах Республики Каракалпакстан, включающие орошаемые земли, пастбища и залежные земли. Отбор проб проводился в весенний и осенний периоды 2023 года. Отбор проводился по стандартной методике. На каждой пробной площадке (размером 50х50 см) вручную отбирали почвенные монолиты глубиной до 30 см. Все обнаруженные дождевые черви тщательно собирались, подсчитывались, взвешивались и фиксировались для дальнейшей идентификации. Для учета глубокозалегающих видов применялся метод раскопки на большую глубину с последующим ручным сбором. Численность выражалась в экземплярах на квадратный метр (экз./м²), биомасса – в граммах на квадратный метр (г/м²). В каждой точке отбора проб проводился анализ основных физико-химических свойств почвы, включая pH, содержание органического вещества (гумуса), азота, фосфора, калия, а также гранулометрический состав и влажность.

Результаты и обсуждения

Исследования показали значительные различия в численности, биомассе и видовом составе дождевых червей в различных типах агроэкосистем Каракалпакстана.

Наибольшие показатели численности и биомассы дождевых червей были отмечены на залежных землях, где средняя численность составила 250-300 экз./м², а биомасса – 50-70 г/м². В орошаемых агроценозах (хлопчатник, пшеница) эти показатели были существенно ниже, варьируя от 50 до 150 экз./м² и от 10 до 30 г/м² соответственно. На пастбищах численность и

биомасса занимали промежуточное положение, но имели тенденцию к снижению при интенсивном выпасе.

Выявлена сильная положительная корреляция между численностью и биомассой дождевых червей и содержанием органического вещества в почве ($R2=0.78$, $p<0.001$). Отрицательная корреляция наблюдалась с уровнем засоления и применением пестицидов ($R2=-0.65$, $p<0.01$). Влажность почвы также оказывала значительное влияние, демонстрируя положительную корреляцию, особенно в засушливые периоды.

Полученные результаты убедительно демонстрируют биоиндикаторный потенциал дождевых червей в агроэкосистемах Каракалпакстана. Снижение численности, биомассы и видового разнообразия дождевых червей в интенсивно используемых агроценозах по сравнению с залежными землями указывает на негативное воздействие сельскохозяйственной деятельности на почвенную биоту.

Основными факторами, ограничивающими развитие популяций дождевых червей в агроэкосистемах региона, являются:

- низкое содержание органического вещества;
- засоление почв;
- применение агрохимикатов;
- режим орошения и обработка почвы/

Таким образом, дождевые черви могут служить надежным индикатором устойчивости и экологического состояния агроэкосистем. Мониторинг их популяций позволяет своевременно выявлять проблемы, связанные с деградацией почв, и разрабатывать меры по их устранению. Интеграция методов агроэкологии, включая использование сидератов, минимальную обработку почвы, органическое земледелие и применение биоудобрений, может способствовать восстановлению и поддержанию здоровых популяций дождевых червей, тем самым улучшая плодородие почв и устойчивость сельскохозяйственного производства в Каракалпакстане.

Заключение

Исследование подтвердило значимость дождевых червей как эффективных биоиндикаторов состояния почв в агроэкосистемах Республики Каракалпакстан. Установлено, что численность, биомасса и видовое разнообразие дождевых червей тесно коррелируют с уровнем органического вещества, засолением и антропогенным воздействием. Мониторинг популяций дождевых червей может быть включен в программы оценки здоровья почв и устойчивого управления земельными ресурсами. Для поддержания и восстановления популяций дождевых червей в агроэкосистемах Каракалпакстана рекомендуется внедрение почвосберегающих технологий, увеличение органического вещества в почве и снижение применения агрохимикатов. Эти меры будут способствовать повышению плодородия почв и устойчивости сельскохозяйственного производства в регионе.

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ГЛОБАЛЛАШГАН ДАВРДА ЁШ АВЛОДГА ТАЪЛИМ-ТАРБИЯ БЕРИШДА ҚАДРИЯТЛАРНИНГ ТУТГАН ЎРНИ

Аннотация: *Ушбу мақолада глобаллашган даврда ёш авлодга таълим-тарбия беришда миллий ва умуминсоний қадриятларнинг тутган ўрни, ахборот технологиялари, оммавий маданият ва глобал таъсирлар, ватанпарварлик, маънан баркамоллик, эзгу ғоялар масаласида тадқиқотлар ўтказилган.*

Калит сўз: *ёш авлод, таълим-тарбия, миллий ва умуминсоний қадриятлар, ахборот технологиялари, оммавий маданият, глобал таъсирлар, ватанпарварлик, маънан баркамоллик, эзгу ғоялар.*

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THE ROLE OF VALUES IN EDUCATING THE YOUNGER GENERATION IN THE ERA OF GLOBALIZATION

Abstract: *This article examines the role of national and universal values in educating the younger generation in the era of globalization, information technologies, mass culture and global influences, patriotism, spiritual maturity, and noble ideas.*

Keywords: *young generation, education, national and universal values, information technologies, mass culture, global influences, patriotism, spiritual maturity, and noble ideas.*

Кириш: Глобаллашган даврда ёш авлодга таълим-тарбия беришда миллий ва умуминсоний қадриятларнинг тутган ўрни беқиёсдир. Бугунги кунда ахборот технологиялари, оммавий маданият ва глобал таъсирлар ёшлар онгига жуда кучли таъсир кўрсатмоқда. Шу сабабли, уларни ватанпарвар, маънан баркамол, эзгу ғояларга содиқ шахслар қилиб тарбиялашда қадриятларнинг роли муҳим аҳамият касб этади.

Таъкидлаш жоизки, мамлакатимизда олиб борилаётган ёшлар бўйича давлат сиёсатининг мантиқий давоми сифатида муҳим аҳамиятга эга. Хусусан, ёш авлодни ҳар томонлама баркамол этиб вояга етказиш мақсадида яхлит ва узлуксиз тизим яратилиши, шубҳасиз, ёшларга оид давлат сиёсатини янги

босқичга кўтаради. Президент эътироф этган ушбу яхлит тизим бола туғилганидан бошлаб, то 30 ёшгача бўлган даврда уни ҳар томонлама давлат томонидан қўллаб-қувватланишини назарда тутади.

Асосий эътибор ёш авлодга таълим тизимининг барча босқичларида сифатли ва замонавий таълим-тарбия беришга, меҳнат бозорида талаб юқори бўлган касб-ҳунарларни ўргатишга ҳамда уларни муносиб иш ўринлари ва уй-жой билан таъминлашга қаратилиши Президент томонидан таъкидланди.

Дарҳақиқат, бугунимиз ва келажагимиз бўлган ёш авлоднинг ҳам жисмонан, ҳам маънан соғлом бўлишларида, уларнинг миллий ва умумбашарий қадриятлар асосида мустақил ва мантиқий фикрлайдиган, эзгу фазилатли ватанпарвар инсонлар бўлиб улғайишларида кучли ижтимоий химоя, сифатли таълим, замонавий билим ва тажрибалар муҳим аҳамиятга эга.

“Янги Ўзбекистон — мактаб остонасидан, таълим-тарбия тизимидан бошланади”, деган ғоя асосида сўнгги йилларда амалга оширилган ислоҳотлар натижасида кичик ёшдаги болаларни мактабгача таълим билан қамраб олиш даражаси икки баробарга ортди, халқ таълими тизимида Президент ва ижод мактаблари, математика, кимё ва биология фанлари бўйича махсус мактаблар ташкил этилди, замонавий профессионал таълим тизими шакллантирилди ҳамда ёшларнинг олий таълим билан қамраб олиш даражаси 25 фоизга етди. Келгуси йилда эса мазкур йўналишларда ислоҳотларни изчил давом эттириш орқали ёшларни замонавий билимлар, илғор хорижий тажрибалар асосида ўқитиш ва шу орқали рақобатбардош миллий кадрларнинг янги авлодини шакллантириш устувор вазифалардан бири сифатида белгиланди.

“Тараққиёт стратегияси” маркази ҳам Ҳаракатлар стратегиясида белгиланган мақсад-вазифалардан келиб чиқиб, “Ёшларни қўллаб-қувватлаш ва аҳоли саломатлигини мустаҳкамлаш йили”да бошқа барча устувор йўналишлар қатори, ёшлар манфаатларини ҳимоя қилиш, таълим сифатини ошириш, ёшлар бандлигини таъминлаш, турмуш шароитларини яхшилаш ва бошқа долзарб масалаларда изланишлар олиб бориб, тегишли идораларга таклиф-тавсиялар ишлаб чиқишни ҳамда мутахассислар ва фаол ёшлар иштирокида турли халқаро анжуманлар ташкил этишни режалаштирмоқда.

Қадриятлар — бу жамият томонидан маъқулланган, авлоддан авлодга ўтиб келаётган маънавий, маданий ва ахлоқий мезонлардир. Улар инсоннинг шахсий ва ижтимоий ҳаётида йўналтирувчи вазифасини ўтайди. Масалан:

- **Миллий қадриятлар**: тил, урф-одатлар, дин, анъаналар, миллий мерос, ватанпарварлик.
- **Умуминсоний қадриятлар**: адолат, инсоф, меҳр-оқибат, тинчлик, ҳамжиҳатлик.

Глобаллашув ва ёшлар:

Глобаллашув бир томондан имкониятлар эшигини очса, иккинчи томондан, миллий ўзлигини йўқотиш хавфини ҳам келтириб чиқаради. Жумладан:

1. Ёшлар бошқа маданиятларнинг таъсири остида қолиши мумкин.
2. Маънавий бўшлиқ пайдо бўлиши эҳтимоли ортиши мумкин.

3. Интернет ва ОАВ орқали кириб келаётган турли мафкуравий таъсирлар.

Қадриятлар орқали тарбиянинг аҳамияти:

1. **Шахсийлик ва фахр туйғусини шакллантиради** – ўз халқининг маданияти, тарихи ва тилига ҳурмат ҳиссини уйғотади.

2. **Маънавий баркамолликни таъминлайди** – ахлоқий, руҳий жиҳатдан соғлом шахс тарбияланади.

3. **Глобал таъсирларга нисбатан иммунитет ҳосил қилади** – ёшлар ўзига хосликни сақлайди, танловни онгли қилади.

4. **Ижтимоий барқарорликни таъминлайди** – жамиятда ҳамжиҳатлик ва ўзаро ҳурмат асослари мустаҳкамланади.

Глобаллашган даврда таълим-тарбия жараёнида қадриятларга таяниш — бу келажак авлодни миллийликни йўқотмаган ҳолда дунёқараши кенг, ахлоқий баркамол шахс сифатида вояга етказишнинг энг самарали йўлидир. Мактаб, оила, жамият ва оммавий ахборот воситалари бу жараёнда ҳамжиҳатликда иш олиб бориши лозим.

Ватанимиз мустақиллигининг маънавий асосларини мустаҳкамлаш, миллий қадриятларимиз, анъана ва урф-одатларимизни асраб-авайлаш, инсонлар, айниқса, ёш авлод қалби ва онгига халқига, она юртига муҳаббат, истиқлолга садоқат туйғуларини чуқур сингдириш масаласи бугунги кунда тобора долзарб аҳамият касб этмоқда. Ўзбекистон Республикаси Президенти Ш.М.Мирзиёев “Биз ёшларга доир давлат сиёсатини ҳеч оғишмасдан, қатъият билан давом эттирамиз. Нафақат давом эттирамиз, балки бу сиёсатни энг устувор вазифамиз сифатида бугун замон талаб қилаётган юксак даражага кўтарамиз. Ёшларимизнинг мустақил фикрлайдиган, юксак интеллектуал ва маънавий салоҳиятга эга бўлиб, дунё миқёсида ўз тенгдошларига ҳеч қайси соҳада бўш келмайдиган инсонлар бўлиб камол топиши, бахтли бўлиши учун давлатимиз ва жамиятимизнинг бор куч ва имкониятларини сафарбар этамиз” деб таъкидлаганлар. Ҳар қандай миллатнинг тараққиёти жамиятимиздаги ёшларнинг амалий фаолиятида ифода этилади. Ёшлар республикамиз аҳолисининг ярмидан кўпини ташкил этади. Бугунги ёшларимиз ғоявий жиҳатдан чиниққан ватанпарвар, замонавий билимларни эгаллаган ва ҳар қандай йўналишда ўз муносабатини билдира оладилар. Улар жамиятнинг шундай ижтимоий гуруҳига мансуб-ки, худди шу ёшлар кучли ҳиссий билиш қобилиятига эгадир. Бугунги кунда ёшлар орасида миллий ғурур, ор-номус ва маънавий-руҳий ҳолатлар устунлигида ҳақиқатни айтишдан чўчимаслик, мавжуд қийинчилик ва муаммоларни очиқ ойдин баён этиш имконияти мавжуд. Бугунги мураккаб глобаллашув даврида маънавий ҳаёт соҳасида вужудга келаётган муаммолар, халқимиз маънавиятини асраш ва юксалтириш, айниқса, ёш авлоднинг қалби ва онгини турли зарарли ғоя ва мафкуралар таъсиридан сақлаш ва ҳимоя қилиш масалаларини долзарблаштирмоқда. Глобаллашув жараёни ҳаётимизга тобора тез ва чуқур кириб келаяпти. Ҳар қайси давлатнинг тараққиёти ва равнақи бошқа минтақа ва ҳудудлар билан чамбарчас боғланиб кетган. Шу ўринда, бирор мамлакат бу воқеликдан четда

туриб ижобий натижаларга эриша олмаслигини англаш қийин эмас. Жамиятда ҳар бир ижтимоий ҳодисанинг ижобий ва салбий томони бўлгани сингари, глобаллашув жараёни ҳам бундан мустасно эмас. Ҳозирги пайтда унинг ғоят ўткир ва кенг қамровли таъсирини деярли барча соҳаларда кўриш, ҳис этиш мумкин. Ҳар қандай тараққиёт маҳсулидан икки хил мақсадда, яъни эзгулик ва ёвузлик йўлида фойдаланиш мумкин. Бугунги кунда ёшларимиз нафақат ўқув даргоҳларида, балки радио-телевидение, матбуот, интернет каби воситалар орқали ҳам ранг-баранг ахборот ва маълумотларни олмоқда.

Ёшлар маънавий оламининг дахлсизлигини асраш учун нималарга таяниб иш олиб боришимиз керак?, деган саволга Ўзбекистон Республикаси Биринчи Президенти И.А.Каримов “тобора кучайиб бораётган бундай хатарларга қарши доимо сергак, огоҳ ва ҳушёр бўлиб яшашимиз зарур. Бундай тахдидларга қарши ҳар томонлама чуқур ўйланган, пухта илмий асосда ташкил этилган, мунтазам ва узлуксиз равишда олиб бориладиган маънавий тарбия билан жавоб бериш мумкин” деб таъкидлаганлар. Ёшларимизнинг маънавий оламида бўшлиқ вужудга келмаслиги учун уларнинг қалби ва онгида соғлом ҳаёт тарзи, миллий ва умуммиллий қадриятларга ҳурмат-эҳтиром туйғусини болалик пайтидан бошлаб шакллантиришимиз зарур. Бугунги кунда инсон маънавиятига қарши йўналтирилган, бир қарашда арзимас бўлиб туюладиган кичкина ҳар қандай хабар ҳам ахборот оламидаги глобаллашув шиддатидан куч олиб, кўзга кўринмайдиган, лекин зарарини ҳеч нарса билан қоплаб бўлмайдиган улкан зиён етказиши мумкин. Бизнинг улуғ аждодларимиз ўз даврида комил инсон ҳақида бутун бир ахлоқий мезонлар мажмуини, замонавий тилда айтганда, шарқона ахлоқ кодексини ишлаб чиққанликларини эслаш ўринли, деб биламан. Отабоболаримизнинг онгу тафаккурида асрлар, минг йиллар давомида шаклланиб, сайқал топган ор-номус, уят ва андиша, шарму ҳаё, ибо ва иффат каби юксак ахлоқий туйғу ва тушунчалар бу кодекснинг асосий маъно-мазмунини ташкил этади, десак, ўйлайманки, хато қилмаган бўламиз. Ўзбекистон Республикаси Президенти Ш.М.Мирзиёев томонидан мамлакатимизда таълим соҳасида мактабгача таълимдан тортиб олий ўқув юртларининг сифатига эътибор қаратиб, таълим соҳасини ривожлантириш билан боғлиқ харажатлар ўқув юртларининг моддий-техник базасини яхшилашга зарур ўқув адабиётлар билан таъминлашга ва шу билан бирга жаҳон андозаларига мос келувчи замонавий таълим муассасаларини қуришга шунингдек, ривожланган хорижий давлатларнинг олий ўқув юртлари филиалларининг очилиши каби бир қатор амалий ишлар амалга оширилмоқда. Буларнинг барчаси ёшларнинг маънавий камолотини оширишда ва уларнинг малакали кадрлар бўлиб етишишларида муҳим аҳамият касб этади. Маънавий соҳада маънавий қадриятларимизни илм-фан ва тараққиёт ютуқлари билан бойитиб бориш, ўзлигимизни чуқурроқ англаш, миллий ғоя ва истиқлол мафкураси тамойилларини халқимизнинг қалби ва онгига сингдириш, муқаддас динимиз ва тарихимизни сохталаштириш, улардан сиёсий мақсадларда фойдаланишларига йўл қўймаслик бу борадаги асосий вазифаларимиздан бири бўлди.

Хулоса ва таклифлар

Ҳозирги кунда, яъни жамият ҳаётининг модернизациялашиш шароитида жамиятда маънавий соҳада қуйидаги вазифаларни бажаришимиз лозим:

- ёшларимизни маънавий янгиланиш ва ислоҳотлар жараёнининг фаол иштирокчисига айлантириш, уларнинг куч ва салоҳиятини ижтимоий ҳамкорлик ва миллатлараро тотувлик, диний бағрикенглик каби эзгу мақсадларга хизмат қилдириш, маънавиятнинг куч-қудратидан эзгу мақсадлар йўлида самарали фойдаланиш, ижтимоий муносабатларни инсонийлик ғоялари асосида ривожлантириш;

- турли қараш ва фикрга эга бўлган ижтимоий қатламлар, сиёсий куч ва ҳаракатларнинг ўзига хос орзу-интилишларини уйғунлаштирувчи ғоялар Ватан равнақи, юрт тинчлиги, халқ фаровонлиги барча юртдошларимиз учун муқаддас мақсадга айланишига эришиш, кўппартиявийлик ва плюрализм тамойилларига амалда риоя қилган ҳолда миллий ҳамжиҳатликни янада мустаҳкамлаш;

- ота-боболаримиз динининг гуманистик моҳиятини кенг жамоатчиликка тушунтириш борасидаги ишларни давом эттириш, дин халқимизнинг минг йиллик тарихи, бугунги маънавий ҳаётимизнинг асоси, Аллоҳ доимо қалбимизда, юрагимизда эканлигининг юртдошларимиз онгига сингдириб бориш. Бунинг учун, аввало:

- оммавий ахборот воситаларида миллий маънавиятимиз акс этган турли хил сифатли ҳамда қизиқарли рақобатбардош кўрсатувлар, сериаллар, кино ва бадиий фильмлар намойишини омма эътиборига тақдим қилиш;

- рақобатбардош телеканалларни кўпайтириб, ҳақиқий рақобат майдонини вужудга келтириш;

- интернет тизимидан фойдаланган ҳолда миллий сайтлар кўпайтириш ҳамда ёшларбоп рукнларни очиш ва улар орқали миллий ғояларни сингдириб боришни таъминлаш;

- жамиятда маънавиятни такомиллаштириш имкониятлари ва истиқболлари мавзуида илмий лойиҳалар жорий этиш ҳамда қонун устуворлигини таъминлаш зарурдир.

Маънавий мерос замонлар ўтиши билан ўз қадрини йўқотмайди, балки сифат жиҳатдан янги аҳамият касб этади. Маънавий мерос кишилар онгига, ички дунёсига, ҳис-туйғусига таъсир этиб, улар онгини бойитади, ахлоқодобини эзгулик сари етаклайди. Шу нуқтаи назардан XXI асрда давлатимизнинг равнақи, унинг кучи ҳамда салоҳияти кўп жиҳатдан халқ маънавиятининг юксаклиги ва поклигига, ёшларимизнинг интеллектуал саводхонлигига, улар онгида ва қалбида миллий ғоянинг шаклланганлигига боғлиқдир.

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ГОСУДАРСТВЕННАЯ ПОДДЕРЖКА СУБЪЕКТОВ МАЛОГО И СРЕДНЕГО ПРЕДПРИНИМАТЕЛЬСТВА: ПРОБЛЕМЫ И ПУТИ ИХ РЕШЕНИЯ

Аннотация: *Статья посвящена совершенствованию механизмов государственной поддержки малого и среднего предпринимательства. Раскрыты приоритетные направления, содействующие развитию малого и среднего бизнеса.*

Ключевые слова: *Малое и среднее предпринимательство, финансовое стимулирование, государственная поддержка, перспективы развития предпринимательства.*

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STATE SUPPORT OF SMALL AND MEDIUM-SIZED BUSINESSES: PROBLEMS AND WAYS OF THEIR SOLUTION

Resume: *The article is devoted to improving the mechanisms of state support for small and medium-sized businesses. Disclosed priority areas to promote the development of small and medium-sized businesses.*

Key words: *Small and medium-sized businesses, financial incentives, government support, prospects for the development of entrepreneurship.*

На современном этапе экономического развития в России и мире, развитие малого и среднего бизнеса играет важнейшую роль. Можно отметить, что в странах с развитой экономикой поддержка малого и среднего бизнеса выступает главной задачей. Для некоторых стран мира предпринимательская деятельность, в принципе, является основой экономики и, как следствие, требует специальных мер, стимулирующих развитие существующих организаций и создание новых.

Субъекты малого и среднего предпринимательства формируют новые рабочие места, внедряют инновационные товары, увеличивают поступления в государственный бюджет, содействуют становлению более экономически развитого общества. В развитых и развивающихся странах Европы, Америки и Азии малое и среднее предпринимательство занимает весомое место в таком макроэкономическом показателе, как ВВП, что определяет не только уровень

экономического развития того или иного государства, но и свидетельствует о том, что в этих странах ведется активная поддержка данного сегмента экономики.

Вклад малых предприятий в ВВП составляет в странах Евросоюза около 67%, в России же данный показатель равен 20-25% [1, с.121].

В связи с этим, становится актуальным вопрос: как увеличить показатели, а именно, вывести их на новый уровень развития. Несомненно, разгадка кроется в совершенствовании механизма государственного регулирования и поддержки предпринимательства.

В последнее время в России проводится активная политика поддержки малого и среднего предпринимательства для обеспечения роста экономики. Предприниматели могут рассчитывать на:

- информационную поддержку и консультирование (семинары, курсы, тренинги и пр.);
- инфраструктурную поддержку (технопарки, бизнесинкубаторы и пр.)
- поддержку инноваций и научно-технических разработок;
- помощь в ярмарочно-выставочной деятельности (в том числе международной);
- правовое и бухгалтерское сопровождение;
- финансовую поддержку (субсидии, гранты, компенсации, льготы).

Также законодательством предусмотрено применение специальных налоговых режимов в области налогообложения для субъектов малого предпринимательства:

- упрощенная система налогообложения (УСН);
- патентная система налогообложения (ПСН);
- единый сельскохозяйственный налог (ЕСХН): С 1 июля 2020 года у всех регионов появилось право вводить льготный налоговый режим для самозанятых.

Помимо этого, внедряются единые стандарты предоставления поддержки в субъектах РФ. Большинство способов и методов поддержки малого и среднего предпринимательства в России либо реализованы, либо применяются в наши дни государством, однако есть несколько проблем в сфере осуществляемой деятельности в области поддержки малого и среднего предпринимательства. Первая важная проблема развития малого и среднего предпринимательства в России – затруднительность финансирования (сильно завышенные цены на финансовые ресурсы; строгие условия к заемщику; продолжительные периоды рассмотрения обращений и др.), хоть и создано большое количество программ финансовой поддержки малого и среднего бизнеса, осуществляемых институтами развития [3].

Как показывает практика, коммерческие финансовые организации не хотят сотрудничать с сектором малого и среднего предпринимательства, так как существует риск невозврата денежных средств, а возврат задолженностей не представляется возможным. На кредитные организации оказывают влияние

ограничения, которые диктует Центральный Банк России, в том числе ключевая ставка по кредитам, поэтому банки имеют узкий круг возможностей. По-прежнему, существуют сложности в получении долгосрочных кредитов на развитие бизнеса [4].

За последние несколько лет были осуществлены меры в рамках Национальной предпринимательской инициативы, но в отдельных видах деятельности сохранилась и остается достаточно острой проблема избыточного административного воздействия на бизнес. Опираясь на данные, которые присутствуют в докладе «Предпринимательский климат в России: Индекс ОПОРЫ» для 30% организаций административные барьеры остаются весьма затруднительными. На сектор малого и среднего предпринимательства оказывается чрезмерно высокая административная нагрузка, выделяется некоторое количество административных процедур (например, государственная регистрация медицинских изделий), преодолеть которые достаточно непросто [5]. Не до конца сформирована структура условий в контексте института технического регулирования, высок уровень коррупции.

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РОЛЬ МАЛОГО БИЗНЕСА В ЭКОНОМИКЕ СТРАНЫ

Аннотация: *значимость малого предпринимательства в экономической системе государства. Влияние малого бизнеса на качество жизни населения, функции и методы.*

Ключевые слова: *предпринимательство, малый бизнес, финансирование, государство, экономика, сотрудничество, поддержка.*

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THE ROLE OF SMALL BUSINESS IN THE NATIONAL ECONOMY.

Annotation: *the importance of small business in the economic system of the state. The impact of small business on the quality of life of the population, functions and methods.*

Keywords: *entrepreneurship, small business, financing, government, economy, cooperation, support.*

На данный момент наблюдается положительная тенденция развития мировой экономики. Происходят многочисленные сотрудничества государств друг с другом, развитие международной торговли, международное разделение труда. Практически каждое развитое государство показывает себя с лучшей стороны на мировой экономической арене, каждая страна пытается выглядеть выигрышно на фоне общей картины.

Однако успех государства в экономической сфере складывается из ряда многочисленных факторов. Одним из главных факторов является внутреннее предпринимательство.

Посмотрев на подготовленность и надежность экономической площадки для предпринимателей внутри страны, можно дальше судить о финансовой обстановке в стране в целом. Немаловажную роль в экономике играет малый бизнес. Под малым бизнесом понимается предпринимательство, опирающееся на деятельность маленьких организаций, в большинстве случаев, не входящее в какие-либо объединения. Также, под субъектами малого бизнеса представляют не только юридические, но и физические лица,

которые осуществляют предпринимательскую деятельность, без регистрации своего дела юридическим знаком.

Рассматривая отдельно развитие малого бизнеса в России, можно сказать, что государство обеспечивает начинающие небольшие организации всеми необходимыми ресурсами. Также, с уверенностью можно сказать, что в Российской Федерации наличие малого предпринимательства играет значимую роль и помогает экономике страны развиваться более быстрыми темпами, объясняют это следующие факторы:

1. Чтобы создать малую организацию, не требуется совершать большие вложения и инвестиции.

2. При создании мелких фирм необязательно обеспечивать длительный срок реализации и использования ресурсов.

3. Небольшие организации проще контролировать и осуществлять управление в них.

4. Малочисленные компании имеют возможность намного быстрее осуществить переоборудование, перейти на более новые средства и следовать научно-техническому прогрессу.

5. В малом бизнесе взаимодействие с потребителями происходит немного чаще, чем на больших предприятиях, следовательно, запросы и пожелания клиентов имеют возможность доноситься и исполняться с более быстро.

6. При острой проблеме безработицы, малый бизнес может улучшить ситуацию, создавая новые рабочие места.

7. Малые предпринимательства частично занимают места на рынке и обеспечивают наиболее полное удовлетворение потребностей покупателей и потребителей.

8. Улучшают качество обслуживания.

Мелкое предпринимательство занимает ведущие значения направлений экономики страны. Именно оно в большинстве случаев может олицетворять тип экономической ситуации в стране, темпы экономического роста, занятость граждан государства, рост валового внутреннего продукта и валового национального продукта. Направления малого бизнеса следуют мировым тенденциям, так как в последнее время становится всё более распространенным и актуальным процесс перехода к смешанной экономике.

Смешанная экономика является наиболее комфортной площадкой для создания бизнеса разного уровня, так как предоставляется производственная свобода в выборе направления, выпускаемой продукции, способов её реализации, средств рекламы и другого и также оказывается большая поддержка со стороны государства, некоторое регулирование финансовых платформ и совершение субсидирований и всякого рода поддержек малого бизнеса.

Малый бизнес также регламентируется законодательством и отделяется по определенным критериям, рассмотрим некоторые из них:

- высчитанная численность привлекаемых на производство работников

- количество оборотных средств за произведенную продукцию в течение отчетного года

- темп роста активов

- характер привлеченных инвестиций

Мелкие фирмы создаются и появляются в зависимости от спроса на небольшие запросы, маленькие партии продукции, которая постоянно претерпевает обновление ассортимента. Также при производстве продукции мелкими предпринимательствами, затрачивается минимальное количество сырья и используемых факторов производства. То есть, можно сказать, что малое предпринимательство закрывает недостающие ниши и перекрывает особые заказы и запросы потребителей, которые трудно выполнить в условиях расширенного производства. Кроме того, малый бизнес в большинстве случаев характеризуется ручным трудом, изделиями «hand made», потому продукция отличается особой индивидуальностью и неповторимостью.

Однако могут возникнуть трудности с договоренностью вкусами потребителей, так как большая часть людей придерживаются консервативных взглядов и не всегда готовы приобретать неизведанный и новейший продукт, который еще не до конца получил доверие населения.

В связи с этим, возникает огромный риск разорения фирм на разных этапах, зачастую это случается и на начальных порах. Поэтому доминирующие места по деятельности, связанной с риском получением нулевого результата занимает именно мелкое предпринимательство. Также, стоит отметить, что малый бизнес имеет множество уязвимых мест.

Одно из них – маленький размер собственного капитала. В начале своей деятельности для такого тип фирм главным источником стартового капитала являются собственные средства. Лишь после того, как фирма показывает успешное ведение дел и реализацию своей продукции, дается возможность привлечения банковского кредита. Однако коммерческие банки с большими рисками и неохотой берутся за сотрудничество с малыми предприятиями, так как возникает огромный риск и отдают предпочтение в кредитовании большим и опытным организациям.

Для малого предпринимательства характерен низкий уровень собственного капитала, исходя из объединенного объема экономических ресурсов. Зачастую, это ведет к увеличению зависимости от банковских кредитов и затрудняет существование коммерческого предприятия. На замену оборудования на предприятии требуются большие финансовые средства, а использование банковского кредита приносит высокие риски банкротства. В этом и состоят отрицательные черты малого бизнеса, сложность его реализации и существования.

Несмотря на негативные моменты, малый бизнес играет значимую роль в развитии экономики любого государства. Так как он имеет множество достоинств, положительных черт и способствует улучшению не только экономических показателей страны, но и повышает качество жизни населения страны. Мелкие фирмы могут существовать совершенно в любом секторе

экономики и отвечать запросам потребителей, осуществляя заказы и запросы потребителей.

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АНАЛИЗ ЦЕННОСТИ УСЛУГ ЖКХ: ПУТЬ К ЭКОНОМИИ

Аннотация. *В данной статье проводится глубокий анализ экономической эффективности услуг, предоставляемых жилищно-коммунальным хозяйством. Целью исследования является выявление ключевых аспектов, влияющих на стоимость и качество обслуживания, а также разработка рекомендаций для повышения их эффективности.*

Ключевые слова. *жилищно-коммунальное хозяйство, сервис, жилищная политика, глобализация, экономическое развитие, жилой фонд, недвижимость, инфраструктура, доход населения, расход населения, индикаторы, условия.*

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ANALYSIS OF THE VALUE OF HCS: THE PATH TO SAVINGS

Annotation. *This article provides an in-depth analysis of the economic efficiency of services provided by housing and communal services. The purpose of the study is to identify key aspects affecting the cost and quality of service, as well as to develop recommendations for improving their effectiveness.*

Keywords. *housing and communal services, service, housing policy, globalization, economic development, housing stock, real estate, infrastructure, income of the population, consumption of the population, indicators, conditions.*

В целях полного удовлетворения потребностей населения в услугах жилищно-коммунального хозяйства, причин и последствий повышения тарифов постановлением Кабинета Министров Республики Узбекистан №897 от 1 ноября 2018 года «О поэтапном изменении цен и тарифов на коммунальные услуги и топливно-энергетические ресурсы» мы рассмотрели анализ в предыдущем пункте.

Система международных статистических показателей использовалась и при комплексном исследовании уровня благосостояния и уровня жизни населения. Он включает в себя 12 типов индикаторов:

1. Рождение, смерть и другие демографические характеристики населения.

2. Санитарно-гигиенические условия.

3. Потребление пищи.
4. Жилищные условия.
5. Информация и культура.
6. Условия труда и занятости.
7. Доходы и расходы
8. Стоимость жизни и потребительские цены.
9. Транспортные средства.
10. Организация отдыха.
11. Социальное обеспечение.
12. Человеческая свобода.118

Эти показатели защищают интересы широких слоев населения и способствуют дальнейшему повышению уровня благосостояния населения в результате улучшения жилищных условий, уровня труда и занятости, санитарно-гигиенических условий, социальной поддержки, организации отдыха, образования и культура.

В Республике Узбекистан, особенно в Кашкадарьинской области, удовлетворение потребности в жилье не идет ни в какое сравнение с уровнем развитых стран. Даже если переход к рыночным отношениям начал приносить относительно высокие доходы, качество услуг, предоставляемых населению, нельзя назвать достаточным. Ведь на улучшение жилищных условий населения влияет несколько факторов. Эти факторы неразрывно связаны между собой, между ними существует определенная взаимосвязь, и развитие одного влияет на изменение другого. Например, чем выше производство, тем выше благосостояние.

В Кашкадарьинской области в 2020 году проживает около 3 280 100 человек на площади 28 700 квадратных километров, а плотность населения в области составляет 114 300 человек на 1 км2/чел.

Обеспеченность населения питьевой водой в районе составляет 50 процентов, в частности, в Косе - 26 процентов, а в Дехканабаде - всего 4 процента. 60 процентов трубопроводов находятся в ремонте. Канализационная система города Карши также устарела. 8 тысяч 700 километров дорог пришли в негодность.

В рамках стратегии «Цифровой Узбекистан – 2030», как указано в программе цифровой трансформации Кашкадарьинской области на 2020-2022 годы, предусмотрено внедрение интеллектуальной системы учета и контроля услуг в жилищно-коммунальном хозяйстве.

В Кашкадарьинской области установка устройств (концентраторов) сбора и передачи данных о потреблении электроэнергии со счетчиков в 2020 году - 3 941, в 2021 году - 5 703, установка 9 152 счетчиков электроэнергии на распределительных пунктах и трансформаторах, подключение потребителей с установленными счетчиками к биллинговой системе - в 2020 году - 338 200, в 2021 году - 316 455, "Худудгаз Кашкадарья" газ в 2020 году

- 90 485; 2020-2021 гг. Внедрение автоматизированной системы учета и контроля расхода природного газа в филиале снабжения АО

«Худудгазтаминот» - в 2021 г. - 60 324, планируется установка счетчиков газа и интеграция в биллинговую систему.

Внедрение системы учета и контроля сжиженного газа в филиале газоснабжения «Худудгаз Кашкадарья» в 2020 году – 184 674, в 2021 году – 246 233, в 2022 году – 184 674, инвентаризация баллонов со сжиженным

газом и установка штрих-кодов в 2020 году – 184 674 в 2021 году – 246 233, в 2022 году - 184 674 потребителя сжиженного газа с пластиковыми картами, внедрение современных информационно-коммуникационных технологий в деятельность служб водного хозяйства, гидрометрии и диспетчеризации. Внедрение системы учета и контроля сжиженного газа в филиале газоснабжения «Худудгаз Кашкадарья» в 2020 году – 184 674, в 2021 году – 246 233, в 2022 году – 184 674, инвентаризация баллонов со

сжиженным газом и установка штрих-кодов в 2020 году – 184 674 в 2021

году – 246 233, в 2022 году - 184 674 потребителя сжиженного газа с пластиковыми картами, внедрение современных информационно-коммуникационных технологий в деятельность служб водного хозяйства, гидрометрии и диспетчеризации.

В целом проведенный анализ дает достаточные основания говорить о том, что отрасль переживает период депрессии в Кашкадарьинской области, особенно в сельской местности (рисунок 1).

Рисунок 1. Сфера услуг и ЖКХ влияющие на условия жизни населения

Если проанализировать основные показатели, отражающие удовлетворение потребностей населения в сфере оказания услуг жилищно-коммунального хозяйства, то в Кашкадарьинской области, входящей в состав

Республики Узбекистан, необходимые темпы развития сфера обслуживания жилищно-коммунального хозяйства в сельской местности в последние годы недостаточно развита. следующие Однако правильное развитие этого сектора открыло бы множество возможностей для повышения благосостояния людей. В существующей литературе отсутствуют значимые подходы к видам факторов, влияющих на жилищно-коммунальную сферу, и их составу.

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АНАСТОМОЗЫ ВЕН ПРЯМОЙ КИШКИ ЧЕЛОВЕКА

Резюме: *В статье изучены венозных сосудов прямой кишки и их анастомозов у людей в возрасте 40-70 лет. Вены заполняли разными инъекционными массами (взвесь туши, парижской сини, свинцовой оранжевой) на 28 препаратах прямой кишки и изучались методами макро-микроскопии и рентген флебографии. Венозные сплетения (слизистое, подслизистое, мышечное, подфасциальное и подкожное) имеют своеобразное строение в различных отделах органа. Следовательно, на различных уровнях слизистого, мышечного и наружного сплетений вен прямой кишки происходит анастомозирование разнокалиберных ветвей двух венозных систем - портальной и кавальной, что может иметь известное значение для обеспечения кровооттока в случаях препятствия на их пути в той или другой системе.*

Ключевые слова: *венозных сосудов прямой кишки, у людей, венозные сплетения, подслизистое, мышечное, подфасциальное, подкожное, ампулярные ветви.*

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ANASTOMOSIS OF HUMAN RECTUM VEINS

Abstract: *The article studies the venous vessels of the rectum and their anastomoses in people aged 40-70 years. The veins were filled with different injection masses (carcass suspension, Paris blue, lead orange) on 28 rectal preparations and studied using macromicroscopy and X-ray phlebography. Venous plexuses (mucous, submucous, muscular, subfascial and subcutaneous) have a unique structure in different parts of the organ. Consequently, at different levels of the mucous, muscular and external plexuses of the veins of the rectum, anastomosis of different-sized branches of two venous systems - portal and caval - occurs, which may have a certain significance for ensuring blood flow in cases of obstruction in their path in one or another system.*

Keywords: *venous vessels of the rectum, in humans, venous plexuses, submucous, muscular, subfascial, subcutaneous, ampullar branches.*

Введение. Ключевым моментом патогенеза геморроя считается нарушение функции артериовенозных шунтов (сосудистый фактор) и связочного аппарата геморроидального сплетения [2,5], что необходимо учитывать при выборе оптимального метода лечения. Характер лечения геморроя зависит от стадии заболевания и наличия осложнений [1,3]. Несмотря на широкую распространенность геморроя, в отечественной литературе практически отсутствуют работы, посвященные изучению этой проблемы в детском возрасте [4,6,7]. Ни в одном литературном источнике не указаны данные о встречаемости данной патологии в детской популяции, хотя ее нельзя отнести к редким заболеваниям. Расширили и углубили существующие представления о пластичности сосудистого русла прямой кишки в эксперименте на животных. Однако, закономерности строения вен данного органа у человека несмотря на то, что они часто подвергаются разным патологическим изменениям, еще недостаточно изучены.

Цель исследования. Нами были изучено анастомозы вен прямой кишки человека.

Материалы и методы исследования. В данном сообщении приводим результаты исследования венозных сосудов прямой кишки и их анастомозов у людей в возрасте 40-70 лет. Вены заполняли разными инъекционными массами (взвесь туши, парижской сини, свинцовой оранжевой) на 28 препаратах прямой кишки и изучались методами макро-микроскопии и рентгено-флебографии.

Результаты исследования. Установлено, что прямокишечные вены со всеми их притоками дренируют определенные территории органа, но связаны в едином русле многочисленными анастомозами. Венозные сплетения (слизистое, подслизистое, мышечное, подфасциальное и подкожное) имеют своеобразное строение в различных отделах органа. Если судить о направлении тока крови в венах по постепенному их утолщению, то можно полагать, что кровь по сосудам сплетения движется от сужений в область расширений и затем по отводящим стволикам в сторону, окружающих прямую кишку поверхностных венозных сплетении. Венозная кровь из подэпителиальной сети слизистой через звездчатые венулы доставляется в базальную сеть, отдельные стволики которой, прободая мышечную прослойку данной оболочки, вливаются в подслизистое сплетение вен. Венозный отток из мышечной стенки осуществляется двумя путями: часть вен наружного продольного мышечного слоя достигает подфасциального сплетения, вены циркулярной мускулатуры направляются в сторону подслизистого сплетения. Венозные клубочки анальных столбиков и синусов дают начало корням верхней и, отчасти, средних прямокишечных вен. Верхние прямокишечные вены, проникая наружу из подслизистого сплетения в виде 6-8 восходящих анально-столбовых ветвей, принимают длинные и короткие ампулярные ветви и сливаются в передне и заднебоковые ветви этой вены. Эти ветви, сливаясь между собой, формируют главные боковые стволы верхней вены. Опоясывая кишку с боков, они на уровне II крестцового позвонка впадают в основной

ствол верхней прямокишечной вены (д. 4-5,5 мм). На уровне мыса последняя отходит от стенки кишки в нижнюю брыжеечную вену. В верхних отделах подслизистая венозная сеть соединяется непрерывно с системой вен сигмовидной кишки. Вены слизистой по 5-6 в виде лучей собираются в короткий стволик (д. 0,5-1,5 мм), который прободая мышечную оболочку, впадает в подфасциальное сплетение. Более тонкие веточки иду кверху под слизистой, анастомозируя с другими такими стволиками; другие - опускаются книзу навстречу восходящим венам, обеспечивая непрерывность подслизистого сплетения на всем протяжении. Подфасциально восходящие вены и их притоки формируют прямоугольные петли 1Х2, 4Х6 мм. В образовании петель принимают участие также короткие ампулярные ветви, многократно анастомозирующие по средней линии на задней поверхности ампулы. В над ампулярных отделах по задней поверхности образуются соединения дополнительных боковых ветвей верхней прямокишечной вены с нижними сигмовидными венами ниже уровня «критической зоны» Зудека. Также довольно часто, устанавливаются тесные связи ветвей верхней прямокишечной вены с венами пристеночной брюшины таза по переднебоковым поверхностям верхне- и среднеампулярных отделов органа.

Ниже, в подбрюшинной части кишки, спереди в толще собственной фасции, отмечены интимные связи передних ветвей верхней прямокишечной вены с венами мочеполового сплетения. Сзади и с боков, на большинстве препаратов (около 2/3), образуются связи задних ветвей верхних прямокишечных вен с венами крестцового сплетения и средними прямокишечными венами на всем пути их следования в подслизистом, мышечном и подфасциальном сплетениях. Нижние прямокишечные вены вступают в связь с выше расположенной сетью вен столбовой зоны, образуя обширную сеть анастомозов в толще переходной складки анального канала.

Вывод. Следовательно, на различных уровнях слизистого, мышечного и наружного сплетений вен прямой кишки происходит анастомозирование разнокалиберных ветвей двух венозных систем - портальной и кавальной, что может иметь известное значение для обеспечения кровооттока в случаях препятствия на их пути в той или другой системе.

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ПАТОМОРФОЛОГИЧЕСКИЕ ИЗМЕНЕНИЯ В ПЕЧЕНИ СОБАК ПОСЛЕ ПЕРЕВЯЗКИ ГРУДНОГО ПРОТОКА НА ШЕЕ

Резюме: *В статье изучены патоморфологическая картина внутриорганной лимфатической системы печени у собак. Имеются попутные морфологические описания при выявлении пространств Диссе после перевязки протока при изучении влияния нарушения лимфообращения в печени после комбинированной перевязки грудного лимфатического и желчного протоков занимался изучением патоморфологических изменений в печени после перевязки грудного протока и правого лимфатического ствола.*

Ключевые слова: *собака, лимфатический сосуд, печень, патоморфологическое изменение, грудной поток.*

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PATHOMORPHOLOGICAL CHANGES IN THE LIVER OF DOGS AFTER LIGATION OF THE THORACIC DUCT ON THE NECK

Abstract: *The article examines the pathomorphological picture of the intraorgan lymphatic system of the liver in dogs. There are related morphological descriptions when identifying Disse spaces after duct ligation, when studying the effects of impaired lymph circulation in the liver after combined ligation of the thoracic lymphatic and bile ducts, he studied pathomorphological changes in the liver after ligation of the thoracic duct and the right lymphatic trunk.*

Key words: *dog, lymphatic vessel, liver, pathomorphological change, thoracic flow.*

Введение: Функциональная морфология лимфатических сосудов печени к настоящему времени изучена достаточно полно во всех ее деталях. Внутриорганная лимфатическая система ее играет важную роль в транспортировке в кровеносное русло фибриногена, белка, значительного количества жидкости и т. д. Достаточно, например, 1,5-часового застоя лимфы в печени, чтобы вызвать гистологическую картину серозного воспаления [4]. Считают, что основное количество лимфы от печени оттекает через грудной проток. Последний же часто перевязывается в клинических условиях после

его повреждения во время операций [3,5]. Следовательно, это вмешательство может вести к временному нарушению лимфообращения в печени. Количество специальных работ, посвященных изучению влияния перевязки грудного протока на состояние внутриорганной лимфатической системы печени, весьма незначительное [1]. Имеются попутные морфологические описания при выявлении пространств Диссе после перевязки протока при изучении влияния нарушения лимфообращения в печени после комбинированной перевязки грудного лимфатического и желчного протоков занимался изучением патоморфологических изменений в печени после перевязки грудного протока и правого лимфатического ствола [2].

Цель исследования. Мы поставили перед собой задачу изучить патоморфологическую картину внутриорганной лимфатической системы печени у собак.

Материалы и методы исследования. Опыты были поставлены на 20 животных. Грудной проток перевязывался на шее. Животные забивались через 2-3 дня, 6-7 дней, 2-4 недели после лигирования протока. Гистологические препараты окрашивались гематоксилин-эозином, пикрофуксином по Ван-Гизону, на аргигрофильные волокна по Футу и эластические волокна по Вейгерту.

Результаты исследования. Через 2 дня после операции мы наблюдали значительное расширение внутриорганной лимфатической сети. Расширенные лимфатические сосуды, проходящие меж дольковой и пери васкулярной соединительной ткани, заполнены лимфой, окрашенной в розовый цвет. Лимфатические капилляры, залегающие в соединительной ткани и расположенные вокруг печеночных вен, также увеличены в диаметре. Вся меж дольковая - соединительная ткань, окружающая лимфатические и кровеносные сосуды, а также желчные протоки, значительно отечна.

Через 3 дня после лигирования грудного протока лимфатические сосуды еще более расширены. Среди капилляров меж дольковой и пери васкулярной лимфатической сети встречаются лимфатические сосуды, в просвете которых имеются единичные эритроциты. Отмечается выраженный (тек меж дольковой соединительной ткани. Через 6-7 дней после операции явления отека меж дольковой соединительной ткани и расширения лимфатических сосудов остаются без изменения.

К концу 2 недели после оперативного вмешательства наряду с расширением лимфатических сосудов печени и что мы наблюдали в своих опытах изменения менее выраженными.

Вывод. Эти изменения обычно наступали не непосредственно после операции, а развивались постепенно и были наиболее выраженными на 3-6 день после операции в виде расширения лимфатических сосудов и отека соединительной ткани. Бесспорно, все эти изменения являются отражением функциональных сдвигов лимфатической системы органа.

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ВОПРОСЫ ЭФФЕКТИВНОГО ИСПОЛЬЗОВАНИЯ ВОДНЫХ РЕСУРСОВ В ЦЕНТРАЛЬНОЙ АЗИИ

Аннотация. *В данной статье рассматривается экологическая ситуация в Центральноазиатском регионе и подчеркивается важность экологических проблем. Был проведен аналитический обзор использования водных ресурсов в Узбекистане и соседних странах, и было отмечено, что формирование рек в регионе происходит преимущественно в горной части, где осадки используются для орошения и других целей из-за испарения. Ежегодное сокращение водных ресурсов в республике, регион относится к группе стран с высоким водным стрессом и его (водной) нехваткой.*

Ключевые слова: *водные ресурсы, распределение воды, дефицит воды, водохозяйственный комплекс, водоснабжение.*

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ISSUES OF EFFICIENT USE OF WATER RESOURCES IN CENTRAL ASIA

Summary. *This article examines the ecological situation in the Central Asian region and emphasizes the importance of environmental problems. An analytical review of the use of water resources in Uzbekistan and neighboring countries was conducted, and it was noted that the formation of rivers in the region occurs mainly in the mountainous part, where precipitation is used for irrigation and other purposes due to evaporation. Annual decrease in water resources in the republic, the region belongs to the group of countries with high water stress and its (water) shortage.*

Keywords: *water resources, water distribution, water scarcity, water management complex, water supply.*

Введение. Экологическая ситуация и проблемы в Центральной Азии, в том числе в Республике Узбекистан, являются одним из приоритетных

направлений охраны окружающей среды. Охрана окружающей среды поднялась на уровень государственной политики. Запреты, проводимые учеными, показывают, что увеличение в последние годы объемов добычи воды из рек Амударья и Сырдарья со стороны граничащего с Узбекистаном государства, как ожидается, приведет к дальнейшему усилению процессов засухи и опустынивания. Это, в свою очередь, серьезно повлияет на уровень жизни населения и приведет к его снижению.

Ожидается, что к 2030 году в Узбекистане будет наблюдаться дефицит воды в объеме 7 миллиардов кубометров. Такая ситуация может привести к тому, что республика войдет в число 33 стран с дефицитом воды в мире.

Основной часть. Во время роста растений тонны воды испаряются в атмосферу. Сотни кубических метров воды должны пройти через растения и испаряться, чтобы увеличить фактический урожай. Например, для выращивания одной тонны картофеля требуется 1500 кубометров воды, для озимой пшеницы - 600 кубометров, для хлопка - 300 кубометров, а для риса - 13500 кубометров. Во время роста культурных растений почва должна содержать 70-75% воды.

Баланс влажности почвы негативно влияет на продуктивность сельскохозяйственных культур. Для эффективного использования водных ресурсов необходимо осуществлять активные балансы влажности в активном слое почвы и деятельность почвы. Мелиоративные и технологически разработанные системы орошения, направленные на ее сохранение в течение всего вегетационного периода, могут обеспечить полностью регулируемые типы почв. Водный режим напрямую связан с использованием оросительной воды и землепользованием в сельском хозяйстве. Проверка стоимости воды возможна только при наличии конечных результатов орошаемого земледелия потребителя.

Вода, получаемая из источников орошения, имеет свои особенности. Основная цель эффективного использования орошаемых водных ресурсов - получение большего количества продукции, и это достигается за счет внедрения различных технологий. Можно сказать, что использование поливной воды в сельском хозяйстве определяется на основе следующих показателей:

- коэффициент эффективности ирригационной системы;
- коэффициент эффективности водопользования в ирригационной системе;
- эффективность использования поливной воды.

Известно, что большая часть приобретенной воды невозвратна, так как можно говорить о потерях воды в результате усталости и ее испарении в оросительных системах: потери составляют 20-25%, а иногда и 40%. Годовое водопотребление Республики Узбекистан составляет 60 миллиардов метров, из которых 50 миллиардов кубометров расходуется на орошаемое земледелие. Охрана загрязнения водных ресурсов является одной из самых глобальных проблем в мире.

В настоящее время в сельском хозяйстве, используя более 20 миллионов гектаров, в том числе 3,2 миллиона гектаров орошаемых земель, выращиваются продукты питания для нужд населения и необходимое сырье для отраслей экономики. В целях повышения плодородия орошаемых земель, улучшения мелиоративного состояния и водоснабжения в рамках государственных программ осуществляются широкомасштабные ирригационные и мелиоративные мероприятия.

В республике разработана концепция, предусматривающая поэтапное повторное использование земель, выведенных из оборота в результате ухудшения состояния ирригации и мелиорации, эффективное использование запасов подземных вод, снижение потерь воды за счет внедрения водосберегающих технологий и реконструкции внутренних ирригационных сетей, а также обеспечение участия в этих работах потенциальных инвесторов.

Еще одна важная проблема - изменение климата. Ученые отмечают, что лето в регионе становится все жарче и засушливее, а территория пустынь постепенно расширяется. Все это приведет к увеличению потребления воды населением, сельским хозяйством и производителями, в результате чего реки и водохранилища станут мелкими, а Аральское море практически исчезнет. Здесь это оказывается беспощадным кругом: чем меньше водных ресурсов - тем меньше осадков, тем теплее климат.

Дефицит воды вызывает споры между республиками Центральной Азии. Например, наша страна занимает 25-е место среди стран с повышенным водным стрессом и 164-м дефицитом воды в Республике Узбекистан. Ожидается, что к 2030 году дефицит пресной воды в Узбекистане приблизится к 7 кубическим метрам, и этот объем составит 4 водохранилища в объеме Чарвака недалеко от Ташкента.

Следует упомянуть еще одну проблему: ирригационные системы, созданные в государствах Центральной Азии со времен бывшего Советского Союза, не были обновлены или восстановлены в республиках с момента обретения независимости. Ухудшение состояния оросительной системы колеблется от 60 до 80%, а в некоторых местах достигает 100%.

На основании приведенного выше анализа можно сказать, что рациональное использование воды и рациональное использование водных ресурсов в условиях ее дефицита и для этого современное математическое моделирование, автоматизированное управление входят в число актуальных вопросов.

В рамках проводимых в последние годы реформ в Узбекистане осуществляются широкомасштабные меры по совершенствованию водопотребления, повышению эффективности государственного управления в управлении водными ресурсами, последовательной реализации ресурсов принципов и систем управления водными ресурсами, работы, направленные на улучшение мелиоративного состояния земель, состояния орошаемых

земель, эффективности использования водных ресурсов, совершенствование системы их учета.

При внедрении автоматизации устанавливается распределение воды по длине водных каналов, клапаны, регуляторы, устройства телемеханики и связи на гидротехнических сооружениях, а центр управления передает данные в режиме реального времени.

Управление и регулирование водопотреблением осуществляется на основе верхнего и нижнего бьефов и комбинированных методов, с учетом каналов, сооружений, резервных резервуаров и устройств сброса воды, ее потребления и колебаний.

Заключение. Автоматизация системы контроля и учета воды, размещение и установка на водохозяйственных сооружениях является одной из приоритетных задач эффективного использования водных ресурсов и создает возможность экономного использования водных ресурсов в нашей республике. Предлагается использовать компьютерную систему для управления водными ресурсами, учета их потребления (воды), мониторинга запасов в водоемах. При этом данные передаются в режиме реального времени, а информация центрального управления передается на управляемые устройства в режиме онлайн.

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СУБЪЕКТЫ ФИНАНСОВЫХ РЫНКОВ И ОРГАНИЗАЦИЯ БУХГАЛТЕРСКОГО УЧЁТА В НИХ

Аннотация: *В статье рассмотрены финансовые рынки, в частности, организация бухгалтерского учёта в коммерческих банках и нормативные документы. На примере акционерного коммерческого банка «Hamkorbank» проанализировано, как правильно ведётся бухгалтерский учёт и как это отражается на основных финансовых показателях банка. В завершение представлены выводы.*

Ключевые слова: *финансовые рынки, коммерческие банки, нормативные документы, бухгалтерский учёт, Hamkorbank.*

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SUBJECTS OF FINANCIAL MARKETS AND THE ORGANIZATION OF ACCOUNTING WITHIN THEM

Abstract: *This article examines financial markets, particularly the organization of accounting in commercial banks and relevant regulatory documents. Using the example of the joint-stock commercial bank "Hamkorbank," the article analyzes how proper accounting is conducted and how it is reflected in the bank's key financial indicators. Conclusions are provided at the end.*

Keywords: *financial markets, commercial banks, regulatory documents, accounting, Hamkorbank.*

В условиях глобализации, стремительного развития цифровых технологий и активизации движения капитала роль финансовых рынков в экономической жизни стремительно возрастает. Особенно значимой становится их функция как ключевого инструмента в мобилизации финансовых ресурсов, их направлении в приоритетные секторы экономики, привлечении инвестиций и финансовой поддержке перспективных проектов. Финансовые рынки по своей структуре включают в себя следующие сегменты: Валютный рынок — обеспечивает торговлю национальными и иностранными валютами; Кредитный рынок — служит для привлечения

краткосрочных и долгосрочных заёмных средств; Рынок ценных бумаг — связан с оборотом акций, облигаций и других финансовых инструментов; Коммерческие банки — предоставляют кредиты, валютный обмен и депозитные услуги; Страховой рынок — предоставляет услуги, направленные на снижение финансовых рисков и обеспечение гарантий против них. Финансовые рынки выполняют посредническую функцию в современной экономике. В этом процессе активно участвуют такие финансовые институты, как банки, инвестиционные фонды, страховые компании и брокерские фирмы. Коммерческие банки считаются неотъемлемой частью финансовых рынков.

Порядок ведения бухгалтерского учёта в банках Узбекистана осуществляется на основании Инструкции №1834 Центрального банка Республики Узбекистан от 11 июля 2008 года. В данном документе изложены принципы организации бухгалтерской службы, документооборота и методы обслуживания клиентов. Правильная организация бухгалтерского учета в банках имеет важное значение, так как эффективный учёт и контроль обеспечивают полное и надёжное выполнение банковской деятельности. С 1 января 2021 года установлено, что коммерческие банки должны вести бухгалтерский учёт и финансовую отчётность в соответствии с Международными стандартами финансовой отчетности (МСФО). Это требует от банков применения современных методов учёта и соответствия международным требованиям. В настоящее время банки осуществляют свою деятельность с учётом международного опыта и практики, адаптируя их к национальным особенностям. В настоящее время коммерческие банки используют следующие нормативные документы:

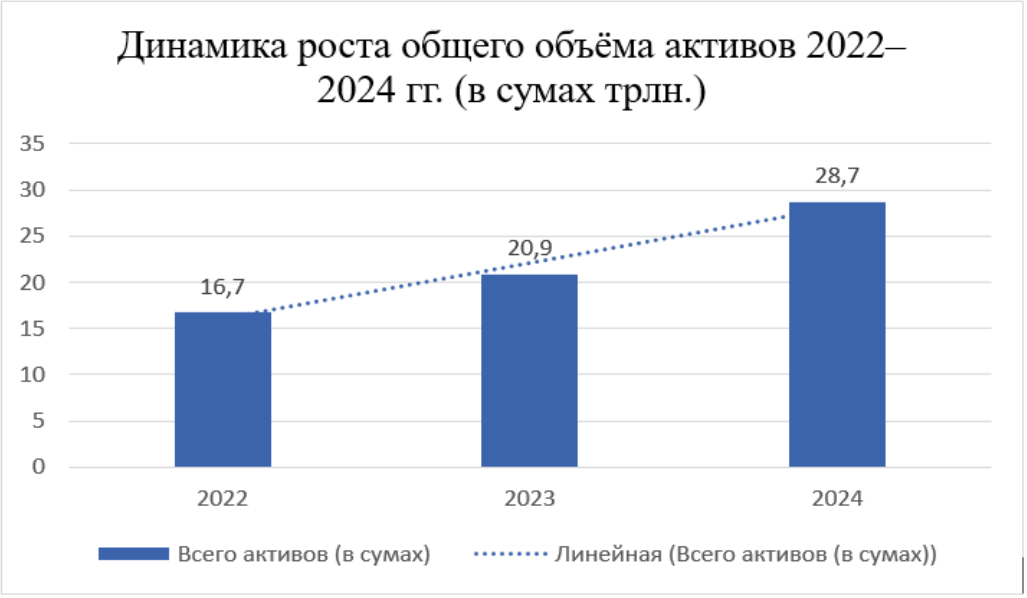
Инструкция №1834 от 11 июля 2008 года «О порядке ведения бухгалтерского учета и организации бухгалтерской работы в банках Республики Узбекистан»; План счетов бухгалтерского учета в коммерческих банках Республики Узбекистан от 26 ноября 2021 года, регистрационный номер 3336; Положение №3229 от 13 апреля 2020 года «О безналичных расчётах в Республике Узбекистан»; Положение №3460 от 29 сентября 2023 года «О порядке начисления процентов в коммерческих банках»; Положение №3337 от 27 ноября 2021 года «О требованиях к учётной политике и финансовой отчётности коммерческих банков»; Инструкция №3028 от 29 июня 2018 года «О кассовой работе в коммерческих банках и порядке инкассации наличных денежных средств и других ценностей»; и другие нормативные документы.

В условиях роста роли частного сектора в экономическом развитии Республики Узбекистан, сфера финансовых услуг, особенно банковская система, развивается в условиях глубоких реформ и усиливающейся конкуренции. С этой точки зрения, акционерный коммерческий банк «Hamkorbank» представляет собой одного из ключевых субъектов финансовой системы страны. Акционерный коммерческий банк «Hamkorbank» с участием иностранного капитала является одним из крупнейших и надёжных частных финансовых институтов банковской системы Узбекистана. С 1991 года банк

осуществляет свою деятельность и на сегодняшний день занимает важное место в финансировании различных отраслей экономики страны благодаря своей широкой сети обслуживания.

Гистограмма – 1.

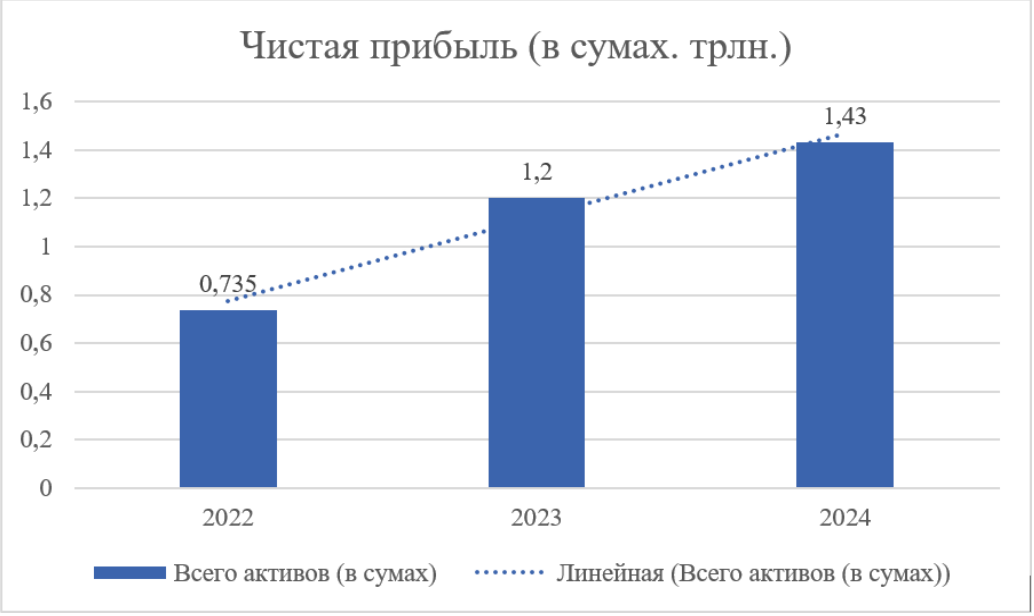
Трёхлетний финансовый анализ акционерного коммерческого банка “Hamkorbank”.



Источник: основана на официальном отчёте АКБ “Hamkorbank” за 2022–2024 годы.

Как видно из гистограмм 1 и 2, за период с 2022 по 2024 год наблюдается стабильный рост как общего объёма активов, так и чистой прибыли АТБ “Hamkorbank”. Общий объём активов увеличился на 71,9%, что свидетельствует о расширении деятельности банка, в том числе за счёт роста кредитного портфеля и активизации валютных операций. В то же время чистая прибыль банка существенно возросла, что говорит об эффективном управлении доходами и расходами, а также о снижении зависимости от процентных доходов благодаря росту доходов от комиссий и валютных операций. Эти показатели подтверждают успешную реализацию стратегии устойчивого развития и укрепление финансовой стабильности банка.

Гистограмма – 2.
Трёхлетний финансовый анализ акционерного коммерческого банка “Hamkorbank”.



Источник: основана на официальном отчёте АКБ “Hamkorbank” за 2022–2024 годы.

Заключение: В целом, за анализируемый период АКБ “Hamkorbank” успешно осуществлял свою деятельность, сохранил финансовую устойчивость и укрепил свою конкурентоспособность. Это подтверждает, что стратегия долгосрочного развития банка выбрана в правильном направлении.

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УДК 556.535.8

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ИССЛЕДОВАНИЕ И ОЦЕНКА ГИДРОХИМИЧЕСКИХ ОСОБЕННОСТЕЙ ВОДЫ РЕКИ АМУДАРЬЯ

Аннотация. *В данной работе проведено исследование гидрохимического состава воды реки Амударья с целью выявления пространственно-временных изменений качества воды и факторов, влияющих на её химический режим. Проанализированы ключевые параметры: минерализация и главные ионы.*

Ключевые слова. *Гидрохимия, Амударья, река, минерализация, главные ионы.*

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INVESTIGATION AND ASSESSMENT OF THE HYDROCHEMICAL CHARACTERISTICS OF THE AMU DARYA RIVER WATER

Annotation. *In this paper, a study of the hydrochemical composition of the Amu Darya River water was conducted in order to identify spatiotemporal changes in water quality and factors affecting its chemical regime. The key parameters are analyzed: mineralization and main ions.*

Keywords. *Hydrochemistry, Amu Darya, river, mineralization, main ions.*

Введение. В современном мире исследователи неоднократно бьют тревогу по поводу изменения климата, потери природы и биоразнообразия, а также загрязнения и отходов. В мире в настоящее время выполняются научно-исследовательские работы по ряду следующих приоритетных направлений: оценка изменения водности и водного режима рек под влиянием антропогенных факторов включая орошение земель, изменение водности речного стока и величины его минерализации по длине рек, особенности

формирования возвратных (коллекторно-дренажных) вод орошаемых массивов и их влияние на качество речных вод, оценка влияния различных антропогенных факторов и изменения климата на гидрологический и гидрохимический режим малых и крупных рек.

Основная часть. Река Амударья является одним из крупнейших водных объектов Центральной Азии, обеспечивающим водными ресурсами Узбекистан, Таджикистан, Туркменистан, Афганистан и Кыргызстан. Амударья берет свое начало в Памирских горах, образуясь в результате слияния рек Пяндж и Вахш. С севера на юг бассейн Амударьи протягивается на 1000 км, а с востока на запад почти на 1500 км. Климат бассейна характеризуется засушливостью, с низким уровнем осадков и высокой испаряемостью воды, что делает Амударью жизненно важным водным источником для региона [1]. Сток этой реки в основном (82-83%) формируется стоком рек Пяндж и Вахш. Поэтому характер питания и режима жидкого стока Амударьи аналогичен таковым составляющих ее рек. Лишь несколько возрастает подземное питание, да в незначительной степени на режим и характер питания Амударьи оказывают влияние ее правые притоки Кафирниган и Сурхандарья (их суммарный сток не превышает 11 % стока Амударьи) и левый приток Кундуздарья (около 4%), несколько уменьшая в общем питании реки долю питания за счет таяния ледников и высокогорных снегов [3].

При исследовании гидрохимических особенностей речных вод особый интерес представляет изменение минерализации по их длине. Этот процесс обуславливается различными природными и антропогенными факторами. К их числу можно отнести выщелачивание легкорастворимых солей из откосов и ложа, наличие в бассейнах засоленных почво-грунтов, участков с выклинивающими подземными водами и испарение. В опубликованных работах специалистов было выявлено, что в соответствии с генетическими особенностями состава поступающих в реку возвратных вод с орошаемой территории, рост минерализации воды по длине реки происходит, главным образом, за счет увеличения хлоридов и сульфатов щелочных и щелочноземельных металлов [2].

Среднемноголетняя величина минерализации (1991-2022 гг.) на верхних створах в течение года изменялась незначительно: на створе Келиф от 420 до 753 мг/л, на створе Атамурат – от 440 до 800 мг/л. В створах Бирата и Кипчак среднемноголетняя величина минерализации изменялась в следующем порядке: на створе Бирата от 615 до 1140 мг/л, на створе Кипчак – от 850 до 1160 мг/л, а в створе Саманбай от 890 до 1185 мг/л.

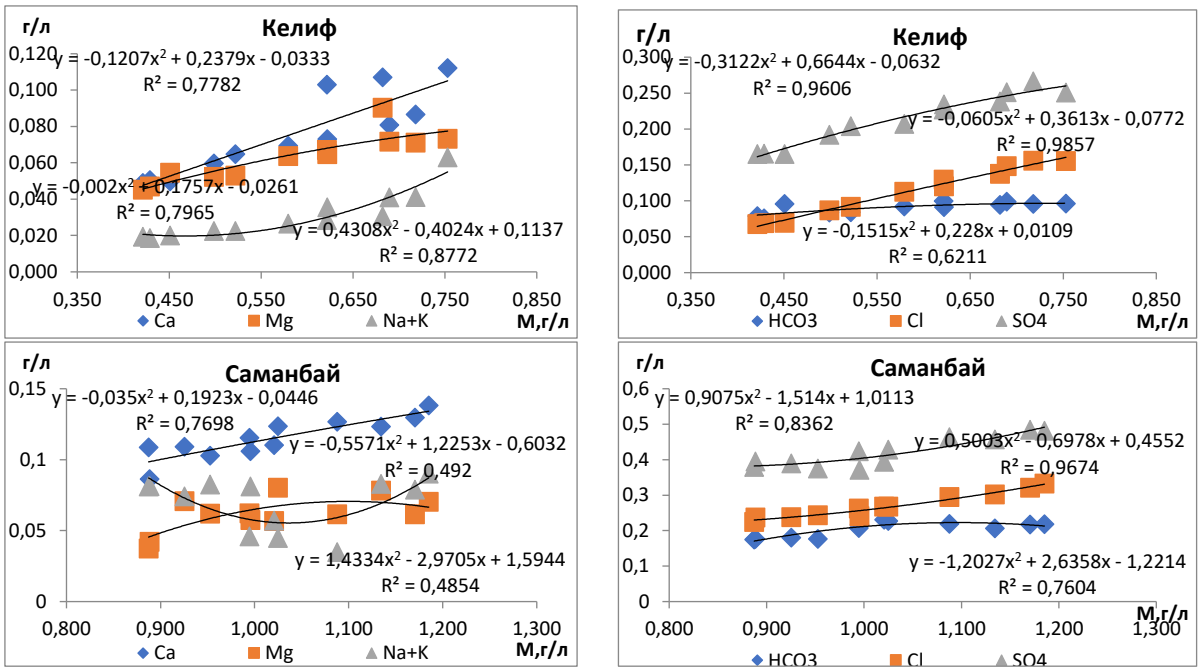

Рисунок. Зависимости изменения содержания главных ионов от величины минерализации воды р. Амударья у створов: а) Келиф, б) Атамурат, в) Чарджоу, г) Бирата, д) Кипчак, е) Тахиаташ, ж) Саманбай за 1990-2022 гг.

В верховьях реки р. Амударьи у створа Келиф среди анионов преобладает сульфатный ион (коэффициент корреляции равен 0,98), на втором месте - хлоридный ион (коэффициент корреляции равен 0,99), на третьем месте - содержание гидрокарбонатного иона (коэффициент корреляции равен 0,79). Среди катионов преобладает ион магния (коэффициент корреляции равен 0,89). На втором месте – ион кальция (коэффициент корреляции равен 0,88), на третьем месте – ион натрия плюс калий (коэффициент корреляции равен 0,93) (рис). При этом, например, с ростом минерализации от 0, 42 г/л до 0,75 г/л содержание сульфатного иона возрастает от 0,04 до 0,09 г/л, а ионы магния от 0,16 до 0,27 г/л, химический состав воды – хлоридно-сульфатный-кальциево-магниевый.

В низовьях реки у створа Саманбай среди анионов преобладает сульфатный ион (коэффициент корреляции равен 0,92), на втором месте - хлоридный ион (коэффициент корреляции равен 0,98), на третьем месте - содержание гидрокарбонатного иона (коэффициент корреляции равен 0,87). Среди катионов преобладает ион кальция (коэффициент корреляции равен 0,88). На втором месте – ион магния (коэффициент корреляции равен 0,7), на третьем месте – ион натрия плюс калий (коэффициент корреляции равен 0,69) (рис). При этом, например, с ростом минерализации от 1,71 г/л до 2,3 г/л содержание сульфатного иона возрастает от 0,37 до 0,49 г/л, а ионы кальция от 0,08 до 0,14 г/л, химический состав воды – хлоридно-сульфатный-натриево-магниево-кальциевый.

Таким образом видно, что при движении речной воды от верховий к низовьям преобладающий химический состав изменяется с хлоридно-

сульфатного-кальциево-магниевого (ХС-КМ) на хлоридно-сульфатный-натриево-магниево-кальциевый (ХС-НМК).

Заключение. Интенсивный рост безвозвратного водопотребления на орошение и развитиеземледелия на территории Центральной Азии, а также ряд остро маловодных лет привели к постоянному уменьшению притока в Аральское море. В результате исследования было выявлено, что влияние антропогенных факторов (забор воды из источников в большом количестве, сброс не очищенных сточных вод из разных отраслях экономики) увеличивается и на определенном уровне рациональное использование водных ресурсов невозможно без достоверных знаний об изменениях в гидрологическом и гидрохимическом режимах территории и стоке рек под их воздействием. Однако, начиная с водозаборов в Каракумский, Каршинский, Аму-Бухарский каналы и так до гидропоста Саманбай сток по стволу реки многократно сокращаются и теперь редко наполняет её протоки. В воде реки Амударья преобладают ионы Cl и SO_4, затем превышают Mg, Ca, Na+K, HCO_3. С ростом общей минерализации воды содержание таких основных ионов, как Cl и SO_4 растет, а темпы роста ионов Na+K, Ca и Mg ослабевают. Анализ результатов многолетних наблюдений показывает общий непрерывный рост минерализации воды, что происходит вследствие больших водозаборов и снижения общей водоносности самой реки, и главным образом из-за сброса большого количества коллекторных вод почти по всей длине реки.

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ПРОБЛЕМЫ РАЦИОНАЛЬНОГО ИСПОЛЬЗОВАНИЯ ЗЕМЕЛЬНЫХ РЕСУРСОВ КАРАКАЛПАКСТАНА

Аннотация. *В статье приведены о проблемах рационального использования земельных ресурсов Каракалпакстана. А также показаны сведения о количественном и качественном состоянии земель, их трансформации за определенный период времени, распределении по категориям и земельным угодьям, а также анализ основных причин негативных процессов, снижающих плодородие орошаемых земель.*

Ключевые слова. *Земля, почва, индикатор, экология, биосфера, пестициды*

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PROBLEMS OF RATIONAL USE OF LAND RESOURCES OF KARAKALPAKSTAN

Abstract. *The article presents the problems of the rational use of land resources in Karakalpakstan. Also, data on the quantitative and qualitative state of lands, their transformation over a certain period of time, distribution by categories and land plots, as well as an analysis of the main causes of negative processes reducing the fertility of irrigated lands, are presented.*

Key words. *Land, soil, indicator, ecology, biosphere, pesticides*

В настоящее время в мире в решении вопросов охраны природной среды и рационального природопользования огромное значение имеют оценка состояния земельных ресурсов и обеспечение государственных органов управления и широких масс населения достоверными сведениями о количественном и качественном состоянии земель, их трансформации за определенный период времени, распределении по категориям и земельным угодьям, а также анализ основных причин негативных процессов, снижающих плодородие орошаемых земель. В связи с этим, при разработке мероприятий по рациональному управлению природопользованием и улучшению их использования определение экологических индикаторов земельных ресурсов имеет важное теоретическое и практическое значение.

В ведущих научных центрах мира проводятся широкомасштабные исследования по выявлению уровня загрязнения окружающей среды и рациональному управлению природными ресурсами, разработке мероприятий по оптимизации экологической ситуации в различных странах, зонах региона. В этом отношении разработка практических мероприятий по эффективному использованию экологических индикаторов в определении состояния отдельных элементов окружающей среды, сохранению экологической безопасности и устойчивости экосистем и биосферы в целом и разработка эффффективных методов для внедрения особенностей их биоиндикаторов имеет особо значение.

В республике в области охраны окружающей среды и улучшения экологической обстановки, сохранения устойчивости государственной экосистемы, рационального использования природных объектов. В том числе обеспечения экологической безопасности для населения достигнуты определенные результаты.

Данные о загрязнении почв пестицидами периодически помещаются в Информационных бюллетенях АНИДИ Государственного комитета по экологии и охране окружающей среды Республики Узбекистан. Основными источниками загрязнения почв в Узбекистане являются выбросы промышленных предприятий, участки размещения бывших сельскохозяйственных аэродромов и ядомогильников, а также участки накопления отходов производства. Для Республики Каракалпакстан

наибольшую опасность представляют участки бывших сельскохозяйственных аэродромов, которых здесь выявлено 51.

Согласно проведенному мониторингу в 2002-2003 гг. и 2015-2018 гг. выявлено, что в пределах Ходжейлийского, Чимбайского, Амударьинского и Кегейлийского районов Республики Каракалпакстан уровень загрязнения почв хлорорганическими пестицидами превышает ПДК более в 5 раз. Превышение ПДК по нитратам было выявлено в Нукусском районе - до 56,8 раз; в Тахиаташском, Ходжейлийском и Чимбайском районах Республики Каракалпакстан от 12,9 до 75,1 раз [1, с. 75].

Различные сведения о пестицидах, примененных в Республике Каракалпакстан в период с 1980 по 1995 гг. приведены в работе А.Б. Курбанова, Т.Б. Ешанова и др. (2000).

В этот период наибольшее количество пестицидов было использовано в 1985-1988 гг., после 1989 г. количество используемых пестицидов стало заметно уменьшаться, и в 1995 г. было использовано всего 350,280 т. Как показали результаты исследований, использование пестицидов распределились по следующей классификации: малотоксичные – 40,9%, высокотоксичные – 36,4%, среднетоксичные – 16,7% и сильно-действующие ядовитые вещества (СДЯВ) – 6,1% [1, с. 75] (рис.2.4).

Согласно официальным существующим данным Министерства сельского хозяйства Республики Каракалпакстан, урожайность хлопчатника в период с 1961 по 2004 гг. постоянно изменялась. В этой динамике можно выделить следующие «небольшие» периоды, в течение которых наблюдались близкие величины урожайности хлопчатника. Исходя из того, что для условий Республики Каракалпакстан кроме хлопчатника, важнейшей сельскохозяйственной культурой является рис, в качестве дополнительного экологического индикатора для оценки состояния земельных ресурсов, мы предлагаем учитывать и урожайность риса (также в ц /га).

Рассмотрим, как изменялись характеристики урожайности риса, которые менялись по периодам лет (в ц /га): в 1961-1966 г.г. - от 17,8 до 25,5; в 1967-1974 г.г. - от 24,0 до 35,8, в 1975-1981 г.г. - от 42,2 до 47,0; в 1982-1994 г.г. - от 26,4 до 43,2 и, наконец, с 1995 по 2004 гг. - с 11,4 до 23,1 ц/га. Отметим, что наблюдается некоторое увеличение урожайности риса в периоды с 1961 по 1966 гг., и в 1967-1974 гг. Максимальные величины урожайности риса наблюдались в 1975-1982 гг., затем наблюдается постепенное снижение показателей, достигнув минимальных величин к 1996-2004 гг.

Орошаемые земли республики Узбекистан по большей своей части подвержены засолению. Это связано с аридностью климата, геологическими и гидрогеологическими условиями орошаемых территорий. Радиационный индекс сухости К [2, с. 180], характеризующий связь энергетического, водного и солевого режимов, и отражающий совокупность основных средообразующих факторов, для рассматриваемой территории колеблется в пределах 2,5 - 12. Коэффициент аридности [2, с. 180] - Ка < 0,12 - 0,3, коэффициент континентальности [2, с. 180; 3, с. 360] - Кк = 220 -290. Эти

показатели в условиях гидроморфного режима являются причиной засоления почв [2, с. 180; 5, с. 4, 6. с 3].

Вне зависимости от аридности климата, процесс накопления солей в почве определяется векторностью результирующей потоков влажности в почвенном слое за длительный период времени [2, с. 180; 3, с. 360]. В аридной зоне, где испаряются и транспирируются относительно большие объёмы воды эти процессы сильно ускоряются и для формирования водно-солевого режима почвы становится очень важно, каким вектором она попадает в неё. По многочисленным данным, корнеобитаемый слой, определяющий жизнедеятельность растений всех видов (от злаков до древесной растительности) не превышает одного метра [4, с. 78-92, 6, с 4]. Орошение полей оказывает влияние на перенос солей в почвах.

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ПОНЯТИЕ И ВИДЫ ПРОЦЕДУРЫ БАНКРОТСТВА ЮРИДИЧЕСКИХ ЛИЦ

Аннотация. *В статье рассмотрены общие вопросы проведения процедур в рамках проведения несостоятельности (банкротства) юридических лиц. Уделяется внимание тем стадиям, которые могут последовательно применяться в процессе осуществления банкротства. Выделены наиболее значимые этапы в проведении банкротства юридического лица.*

Ключевые слова: *несостоятельность, банкротство, юридические лица, виды процедуры банкротства.*

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THE CONCEPT AND TYPES OF BANKRUPTCY PROCEDURES FOR LEGAL ENTITIES.

Annotation. *The article discusses the general issues of conducting procedures in the framework of insolvency (bankruptcy) of legal entities. Attention is paid to those stages that can be consistently applied in the bankruptcy process. The most significant stages in the bankruptcy of a legal entity are highlighted. Conclusions are drawn about the prospects for the development of procedures.*

Keywords: *insolvency, bankruptcy, legal entities, types of bankruptcy proceedings.*

Современный этап развития рыночных отношений в России предопределяет определенную значимость института банкротства юридических лиц.

В этой связи предоставляется важным обратится к понятию банкротства, существующему в современной юридической науке.

Шершенеевич Г.Ф. считает, что под банкротством следует понимать неосторожное или умышленное причинение несостоятельным должником ущерба кредиторам посредством уменьшения или скрытия имуществ[10].

По мнению Шамсиевой Р.Ф. банкротство – это сложный процесс, который можно охарактеризовать с разных позиций. Процедуру банкротство

можно представить в качестве завершающей стадии неудачной деятельности предприятия, которой, как правило, предшествуют стадии ритмичной нормальной работы и стадии финансовых затруднений [11].

Горфинкель В.Я, Швандар В.А. дают понятию банкротство как состояние неспособности должника расплачиваться по собственным обязательствам, другими словами, жестко установленное состояние его неплатежеспособности, при котором к его имуществу может быть предъявлено взыскание со стороны кредиторов [2].

В настоящее время большое значение имеет проведение процедуры банкротства в соответствии с нормами действующего законодательства. Итак, определяя основы правовой регламентации процедуры банкротства юридического лица, следует обратиться к нормам ФЗ «О несостоятельности (банкротстве)» [9].

В соответствии с ч. 2 ст. 3 Закона о банкротстве «юридическое лицо считается неспособным удовлетворить требования кредиторов по денежным обязательствам, о выплате выходных пособий и (или) об оплате труда лиц, работающих или работавших по трудовому договору, и (или) исполнить обязанность по уплате обязательных платежей, если соответствующие обязательства и (или) обязанность не исполнены им в течение трех месяцев с даты, когда они должны были быть исполнены» [9].

В тоже время, следует отметить, что в процедуре банкротства юридического лица имеются негативные аспекты.

Так например, следует согласиться с Мининой А.А., Богатыревой А.Т. и Огурлиевым А.З., что на сегодняшнее время банкротство – это «игра профессионалов», главные действующие лица которой – профессиональные должники, профессиональные кредиторы и профессиональные арбитражные управляющие. В этих условиях процедура банкротства уже давно стала способом получения прибыли, хотя ее реальная цель – вернуть в экономику бизнес по каким-то причинам, оказавшийся в кризисном состоянии, а так же устранить убытки для тех, кому они причинены[6].

Львова О.А. считает, что «банкротство» это акт мошенничества со стороны должника, кражу путем бегства с чужой собственностью с целью избежать преследования и уплаты долгов [5].

Согласно Ковалеву И.А., банкротство – неплатежеспособный должник виновно совершает уголовно-наказуемые деяния, наносящий ущерб кредиторам[4].

Очевидно, что о необходимости введения процедуры банкротства свидетельствует ситуация, когда состояние финансового положения и имущества коммерческих организаций, достоверно подтверждают недостаточность средств для удовлетворения требований кредиторов (гражданско-правовые обязательства, обязательные платежи, оплата труда и пр.), которые были предъявлены.

Правом на обращение в арбитражный суд с заявлением о признании должника банкротом обладает определенный круг лиц. Сюда следует отнести

конкурсного кредитора, должника, уполномоченные на то органы, что следует из ст. 7 ФЗ «О несостоятельности (банкротстве)»

Закона о банкротстве. Как правило, момент обращения с заявлением в арбитражный суд совпадает со вступлением в законную силу решения суда в части денежных обязательств.

В юридической литературе неоднократно высказывалось мнение о том, что в процессе осуществления банкротства организации выделяются стадии [6]. С таким подходом следует согласиться, при этом необходимо учитывать тот факт, что количество стадий зависит от конкретных обстоятельств дела и определяется арбитражным судом. Соответственно, происходит определение конкретных мер, которые будут далее применяться, исходя из возможности восстановить платежеспособность и других обстоятельств.

Процесс по осуществлению банкротства организации (юридического лица) является длительным, состоящим из целого ряда структурных элементов (стадий). Важным является тот факт, что при достижении согласия юридическим лицом (должником) и кредитором, любая стадия может завершить в целом процедуру банкротства.

Исходя из норм Закона о банкротстве, можно выделить ряд применимых процедур:

- наблюдение;
- финансовое оздоровление;
- внешнее управление;
- конкурсное производство;
- мировое соглашение.

Процедура наблюдения вводится с момента рассмотрения требований кредитора, заявленных в арбитражный суд. Подразумевается, что в процедуре наблюдения (длится до семи месяцев) принимает участие временный управляющий, в число полномочий которого входит проведение контрольных мероприятий и выдача согласий на определенные сделки. Как правило, основная цель заключается в сохранении имущества юридического лица.

В это время руководство юридического лица реализует деятельность в обычном режиме, с определенными ограничениями. По окончании которого, выносится определение о введении финансового оздоровления или внешнего управления. Соответственно, исходя из этого, юридическое лицо может признаваться банкротом, открывается конкурсное производство.

В том случае, если применяется процедура финансового оздоровления, основной целью становится восстановление платежеспособности должника и погашение текущей задолженности, процедура занимает до двух лет. В период финансового оздоровления производятся следующие действия со стороны должника: расчеты с кредиторами, включенные в реестр требований кредиторов в соответствии с графиком погашения задолженности. На этапе финансового оздоровления, равно как и на этапе наблюдения, органы юридического лица могут сохраняться в прежнем составе. Этап финансового оздоровления связан с деятельностью административного управляющего.

Если имеют место основания предполагать, что присутствует возможность восстановить положение юридического лица (п. 6 ст. 88 Закона о банкротстве), вводится процедура внешнего управления. В этом случае руководство юридического лица, его управляющие органы действие прекращают, вся деятельность осуществляется под руководством внешнего управляющего. Как правило, внешнее управление вводится не более установленного в законе временного периода (18 месяцев, с возможностью продления на срок, не превышающий 6 месяцев. Необходимо отметить, заключение мирового соглашения допускается на любой стадии процедуры банкротства.

Заслуживает внимания тот факт, что кредиторы вправе осуществить обращение в арбитражный суд с ходатайством о продлении внешнего управления.

Завершающей стадией в процедуре банкротства становится конкурсное производство (конкурсное производство вводится на срок до шести месяцев, срок конкурсного производства может продлеваться по ходатайству лица, участвующего в деле, не более чем на шесть месяцев), с последующим прекращением деятельности юридического лица. Удовлетворение требований кредиторов осуществляется на основании правил, установленных законом. Погашение существующих требований кредиторов реализуется за счет денежных средств и имущества, которое находится во владении соответствующей коммерческой организации. Наиболее важные полномочия на этапе конкурсного производства отводятся конкурсному управляющему.

Основными целями законодательства о банкротстве являются: сохранить жизнеспособность предприятия (т.е. с помощью юридических механизмов помочь предприятию, переживающего тяжелые времена, оставаться в деле) и обеспечить защиту интересов кредиторов, удовлетворив оптимальным образом их требования по отношению к данному предприятию [3].

Подводя итоги, следует отметить, что процедура несостоятельности (банкротства) – это совокупность процессуальных и не процессуальных действий, находящих отражение в определенных стадиях. К перспективам развития процедур банкротства необходимо отнести повышение качества правового регулирования тех процедур, которые направлены на реабилитацию юридических лиц. Повышенное внимание следует уделить вопросам правового регулирования реабилитационных процедур применимых к юридическому лицу, а также усилить меры ответственности конкурсного управляющего, равно как и на законодательном уровне более детально закрепить особенности его правового статуса. У банкротства юридического лица есть ряд недостаток: реализация имущества и активов компании, полная ликвидация компании-банкрота, вероятность оспаривания совершенных ранее сделок, вероятность привлечения руководителей и собственников к субсидиарной ответственности.

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ВЛИЯНИЕ ЗАНЯТИЙ В ТРЕНАЖЕРНОМ ЗАЛЕ НА ЗДОРОВЬЕ СТУДЕНТОВ

Аннотация: *Современный ритм жизни и растущие требования к образованию ставят студентов перед лицом значительных физических и умственных перегрузок. В связи с этим, актуальным становится поиск эффективных средств и методик, направленных на поддержание выносливости, повышение стрессоустойчивости и развитие навыков саморегуляции у студенческой молодежи. Данная статья посвящена исследованию влияния занятий в тренажерном зале на общее состояние здоровья студентов, испытывающих повышенные нагрузки в процессе обучения. Особое внимание уделяется анализу физиологических и психологических аспектов воздействия тренировок с отягощениями на организм, а также их роли в формировании здорового образа жизни и повышении адаптационных возможностей студентов.*

Ключевые слова: *тренажерный зал, состояние здоровья, здоровье студентов, двигательная активность.*

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THE IMPACT OF GYM CLASSES ON STUDENTS' HEALTH

Annotation: *The modern pace of life and the growing demands on education put students in the face of significant physical and mental overloads. In this regard, it is becoming urgent to search for effective means and techniques aimed at maintaining endurance, increasing stress tolerance and developing self-regulation skills among students. This article is devoted to the study of the impact of gym*

classes on the general health of students experiencing increased stress during the learning process. Special attention is paid to the analysis of the physiological and psychological aspects of the impact of resistance training on the body, as well as their role in shaping a healthy lifestyle and increasing students' adaptive capabilities.

Keywords: *gym, health status, health of students, physical activity.*

Актуальность проблемы. В современном образовании приоритетное внимание уделяется не только академическим успехам, но и состоянию здоровья, физической подготовке и гармоничному развитию учащихся. Здоровье рассматривается как фундаментальная потребность человека, обеспечивающая возможность продуктивной деятельности и полноценной самореализации в будущем. Именно поэтому активный образ жизни и достаточная двигательная активность приобретают особую значимость для каждого молодого человека.

Цель исследования: изучение влияния регулярных занятий в тренажёрном зале на здоровье студентов высших учебных заведений. Основное внимание уделяется оценке изменений физического состояния, функционального резерва организма и психоэмоционального статуса студентов, занимающихся физической активностью систематически.

Материалы и методы исследования: для участия были привлечены студенты различных факультетов университета в возрасте от 18 до 25 лет. Все участники предварительно дали информированное согласие на участие в исследовании, прошедшем этическое одобрение комиссии университета.

Современное общество сталкивается с серьезной проблемой снижения работоспособности среди студентов и молодых специалистов, во многом обусловленной распространением цифровых технологий и, как следствие, преобладанием малоподвижного образа жизни. Разработчики новых технологических решений, стремясь к автоматизации производственных процессов, часто упускают из виду негативное влияние недостатка физической активности на организм. Гиподинамия, вызванная сидячей работой и ограниченным движением, приводит к ухудшению физического и психического здоровья, снижению концентрации внимания и, в конечном итоге, к снижению общей эффективности труда. В связи с этим, поиск путей интеграции физической активности в повседневную жизнь, особенно для студенческой молодежи, становится важной социальной задачей.

В Российской Федерации наблюдается активное развитие не только традиционной физической культуры, но и ее инновационных форм, что создает благоприятные условия для внедрения оздоровительных мероприятий в высших учебных заведениях. Данный аспект имеет общегосударственное значение и проявляется в растущей популярности такого направления фитнеса, как занятия в тренажерном зале.

Термин «фитнес», прочно вошедший в спортивный лексикон, берет свои корни в английском языке, где выражение «to be fit» означает «быть в форме»,

«поддерживать себя в хорошем состоянии». Современные специалисты рассматривают фитнес в широком контексте, как стремление человека к комплексному улучшению качества жизни, достижению оптимального баланса всех составляющих здоровья и благополучия, включая социальный, психический, духовный и, конечно, физический аспекты. Таким образом, занятия в тренажерном зале, как одна из форм фитнеса, способствуют не только развитию физической силы и выносливости, но и позитивно влияют на психоэмоциональное состояние и социальную адаптацию студентов.

Результаты исследований указывают на то, что система физического воспитания в российских вузах зачастую не обеспечивает студентов достаточным уровнем физической подготовки и оздоровления. Одним из ключевых противоречий является несоответствие между высокими требованиями, предъявляемыми к студентам в рамках общекультурной и профессиональной подготовки, и ограниченными возможностями, предоставляемыми в сфере физического воспитания. Существующие средства и методики физической культуры в вузах зачастую не соответствуют современным потребностям и возможностям студентов.

Вопрос повышения эффективности дисциплины «Физическая культура» для студентов высших учебных заведений уже на протяжении многих лет остается актуальной и не теряющей своей остроты проблемой. Необходимость поиска новых подходов, современных методик и эффективных инструментов, позволяющих повысить интерес студентов к занятиям спортом и физической культуре, а также обеспечить их всестороннее физическое развитие, является очевидной и требует дальнейшего изучения и практической реализации.

Наблюдается устойчивая тенденция к снижению двигательной активности среди студенческой молодежи, что закономерно приводит к ухудшению их физического состояния. Параллельно фиксируется рост числа различных отклонений в состоянии здоровья студентов. Современный образовательный процесс характеризуется высокой интенсивностью, напряженностью и огромным потоком информации, в то время как физические возможности студентов зачастую не соответствуют возросшим требованиям, предъявляемым образовательными учреждениями [2].

Такое несоответствие негативно сказывается на успеваемости, приводит к снижению показателей здоровья и падению репродуктивного потенциала молодежи. В связи с этим, назрела острая необходимость в пересмотре содержания программ физического воспитания в высшей школе, с акцентом на современные, эффективные и, что немаловажно, привлекательные для студентов виды физической активности, учитывающие их запросы и мотивацию. Важно создавать условия для формирования устойчивого интереса к занятиям спортом и физической культурой, способствовать осознанию студентами ценности здоровья и необходимости ведения активного образа жизни [5].

Важно отметить значительную роль занятий в тренажерном зале как эффективного инструмента для формирования у студентов устойчивого, осознанного отношения к физической активности. Регулярные тренировки помогают организму постепенно адаптироваться к физическим нагрузкам, способствуют переосмыслению устоявшихся представлений о здоровом образе жизни и формируют правильное восприятие ценности здоровья.

Несмотря на постоянно меняющиеся общественные запросы и веяния моды, наблюдается устойчивая тенденция популяризации здоровых практик среди молодежи. В этой связи, необходимо целенаправленно формировать у студентов мотивацию к ведению здорового образа жизни, акцентируя внимание на приоритете здоровья и внешней привлекательности, достигаемых путем регулярных и грамотно организованных тренировок в тренажерном зале. Важно подчеркивать, что занятия в тренажерном зале – это не только способ улучшить физическую форму, но и инвестиция в свое будущее здоровье и благополучие.

Следует признать, что традиционные принципы физической культуры, как отечественные, так и зарубежные, претерпевают значительные изменения, утрачивают свою прежнюю четкость и трансформируются в современные технологии физической культуры. Этот процесс охватывает широкий спектр элементов: от разнообразных физических упражнений и возможностей для двигательной активности до оздоровительных методик, программ и инновационных разработок, созданных различными авторами.

В контексте занятий в тренажерном зале, ключевым ориентиром является оздоровление. Физическая нагрузка рассматривается не как самоцель, а как средство укрепления здоровья, повышения функциональных возможностей организма и улучшения общего самочувствия. Таким образом, современный подход к физической культуре, реализуемый в тренажерных залах, предполагает интеграцию передовых технологий и принципов, направленных на достижение оптимального здоровья и благополучия занимающихся.

Все вышеизложенное подтверждает, что внедрение такого компонента фитнеса, как занятия в тренажерном зале, в программу высшего образования с целью положительного влияния на здоровье студентов является обоснованным и перспективным решением.

Важно понимать, что понятие «fitness» является многогранным и подразумевает не только занятия спортом или физической культурой в тренажерном зале, но и грамотно подобранную диету, коррекцию веса посредством двигательной активности, а также формирование здоровых привычек в целом.

Цель внедрения фитнес-компонента в программу высшей школы – помочь студентам постепенно освоить принципы здорового образа жизни, научиться правильно питаться, стремиться к поддержанию молодости тела и бодрости духа. Это позволит им не только улучшить свое физическое

состояние, но и повысить работоспособность, укрепить иммунитет и снизить риск развития различных заболеваний в будущем.

Стоит отметить, что современная система преподавания физической культуры в высших учебных заведениях часто носит формализованный характер, упуская из виду важные психологические аспекты формирования здорового образа жизни. Высшее образование должно стремиться к созданию у студентов целостного понимания красоты и здоровья человеческого тела, осознания функциональных возможностей организма, начиная с первых занятий по физической культуре и уделяя особое внимание пользе занятий в тренажерном зале.

Текущий учебный процесс, как правило, вынуждает студентов проводить длительное время в недостаточно проветриваемых помещениях, сохранять неудобную позу, что негативно сказывается на их здоровье, несмотря на увеличение объема получаемых знаний. Мышцы, связки и костная ткань испытывают дефицит необходимых нагрузок, теряют эластичность и работоспособность, подвергаются риску развития атрофии и патологических изменений.

Статистические данные подтверждают данную проблему: заболеваемость среди студентов, что подчеркивает недостаточность существующего курса физической культуры и его неспособность обеспечивать необходимую двигательную активность и полноценное развитие физических качеств, необходимых для поддержания здоровья и высокой работоспособности [1].

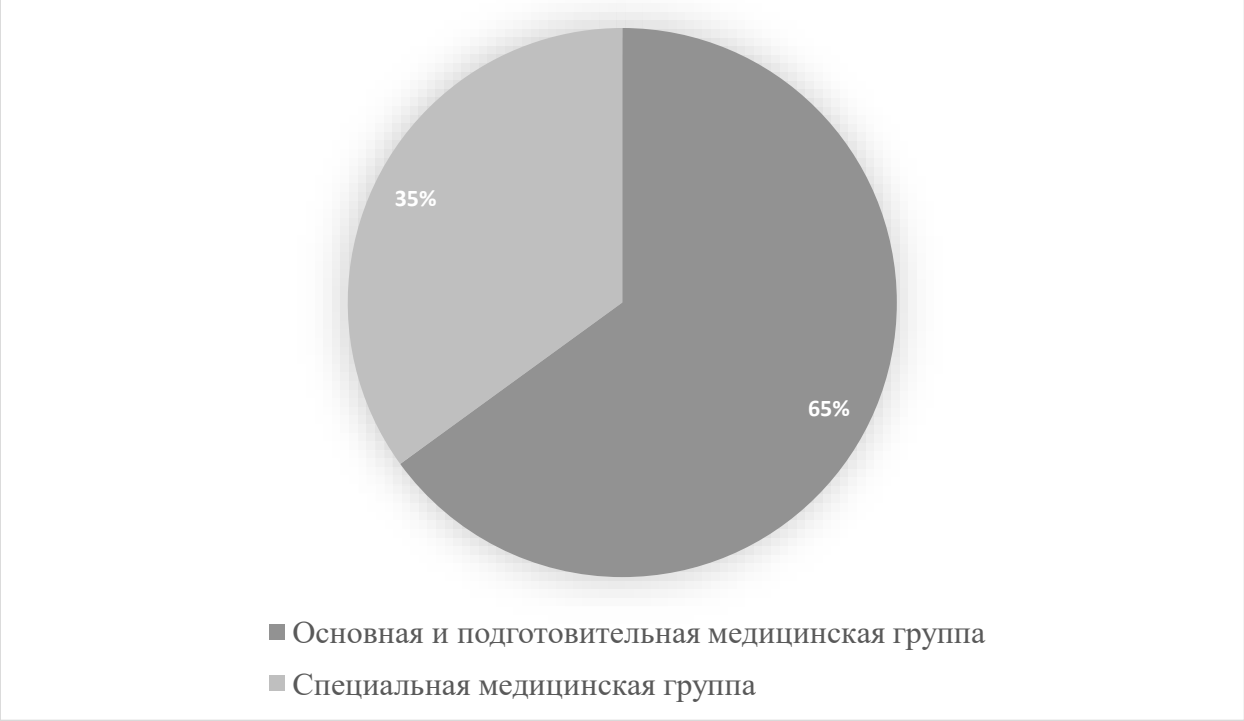

Рисунок 1 – Статистика медицинских групп студентов

Недостаток физической активности – основная причина многих заболеваний. Движение – это естественная потребность организма, необходимое условие его развития и адаптации. Гиподинамия, или недостаток движения, приводит к серьезным проблемам со здоровьем. В связи с этим, физическое воспитание играет ключевую роль в формировании здорового поколения. К сожалению, в России уровень двигательной активности населения значительно ниже, чем в развитых странах. Регулярно занимаются физической культурой менее 27% россиян, тогда как в развитых странах этот показатель достигает 45% [3].

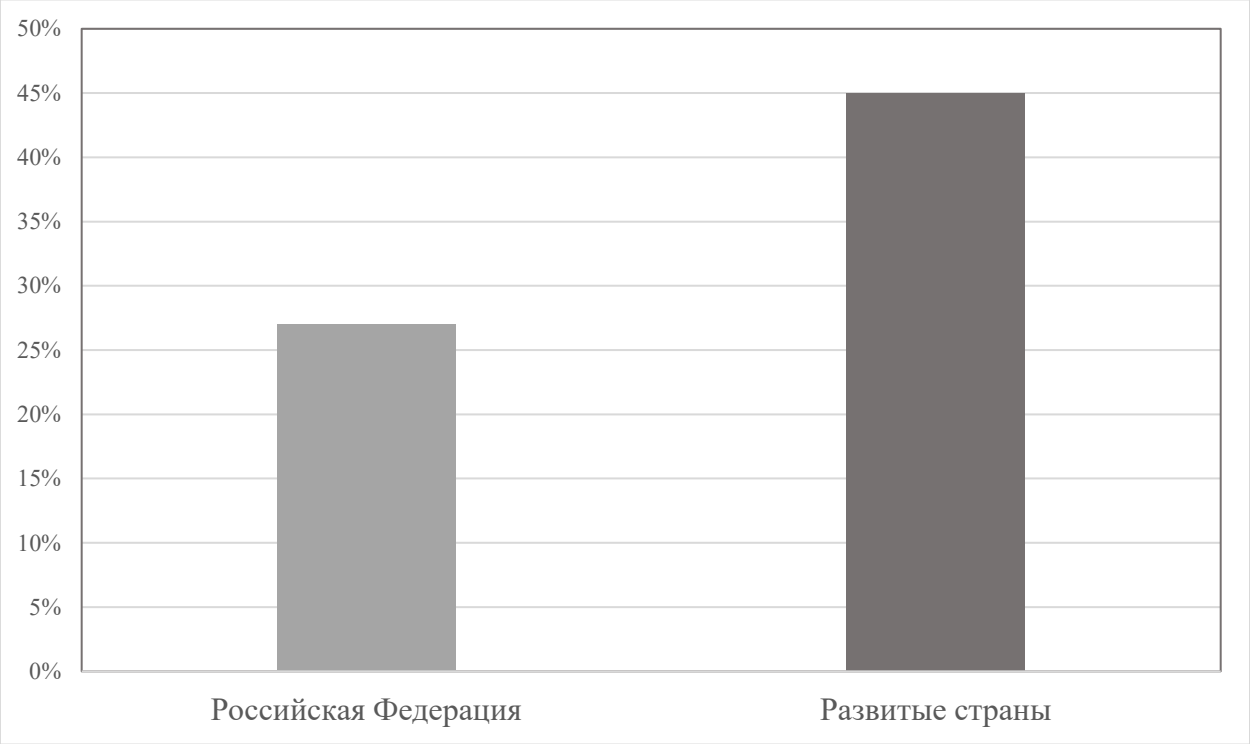

Рисунок 2 – Статистика двигательной активности

Безусловно, центральным элементом физической культуры в высшем учебном заведении должна стать осознанная и активная позиция самого студента, ориентированная на поддержание и развитие всех составляющих здоровья – социального, психологического и физического.

Современные научные исследования убедительно демонстрируют, что именно занятия в тренажерном зале позволяют человеку достичь гармонии между физическим и духовным состоянием, способствуют улучшению психического и физического самочувствия, поддерживают высокий уровень общего тонуса организма на ежедневной основе. Важно подчеркнуть, что регулярные и правильно организованные тренировки в тренажерном зале не только улучшают физическую форму, но и оказывают положительное влияние на эмоциональное состояние, повышают уверенность в себе и способствуют формированию позитивного отношения к жизни [2].

Опыт высшей школы показывает, что студенты зачастую демонстрируют недостаточное внимание к собственному здоровью, не

проявляют достаточной мотивации и не видят смысла в посещении занятий физической культурой, в том числе и в тренажерном зале. Это подчеркивает необходимость внедрения и активного использования инновационных методов в сфере физического воспитания.

Важно понимать, что внедрение занятий в тренажерном зале в качестве альтернативы традиционным занятиям по физической культуре может стать не только эффективным инструментом популяризации здорового образа жизни, но и позволит студентам непосредственно наблюдать результаты физических нагрузок и регулярных тренировок, что, в свою очередь, будет способствовать повышению их мотивации и вовлеченности.

При этом идеология и целеполагание занятий в тренажерном зале должны быть в первую очередь ориентированы на оздоровление, улучшение общего самочувствия и повышение функциональных возможностей организма, а не только на достижение спортивных результатов.

При пропаганде занятий в тренажерном зале среди студентов важно акцентировать внимание на позитивном влиянии тренировок на здоровье студенческой молодежи, подчеркивая следующие ключевые аспекты:

1. Формирование правильной осанки – занятия на тренажерах способствуют укреплению мышц спины и корпуса, что необходимо для поддержания правильной осанки и, как следствие, оптимального расположения внутренних органов.

2. Увеличение эластичности и прочности костей и связок – регулярные тренировки способствуют укреплению костной ткани и повышению эластичности связок, что значительно снижает риск травматизма при падениях или ушибах.

3. Позитивное влияние на состояние суставов – умеренные спортивные нагрузки укрепляют мышцы, окружающие суставы, и улучшают их питание, что благотворно сказывается на их состоянии и подвижности.

4. Развитие и укрепление дыхательной системы – занятия в тренажерном зале улучшают вентиляцию легких, увеличивают жизненную емкость легких и повышают эффективность дыхательной системы в целом, снижая риск развития бронхолегочной патологии.

5. Тренировка сердечной мышцы – регулярные физические нагрузки укрепляют сердечную мышцу, повышают ее выносливость и улучшают кровообращение, что способствует профилактике инсультов и инфарктов в будущем.

6. Улучшение кровообращения и питания головного мозга – активное кровообращение, стимулируемое физическими упражнениями, обеспечивает лучшее снабжение тканей головного мозга кислородом и питательными веществами, что приводит к повышению как умственной, так и физической работоспособности.

7. Снижение уровня стресса и улучшение психоэмоционального состояния – физические упражнения способствуют выработке эндорфинов, естественных антидепрессантов, снижают уровень стресса, улучшают

гормональный фон, стимулируют и укрепляют работу центральной нервной системы.

Безусловно, необходимо помнить, что занятия в тренажерном зале, как и любой вид физической активности, могут оказывать не только положительное, но и потенциально негативное влияние на здоровье. Поэтому крайне важно учитывать индивидуальные особенности каждого студента и настоятельно рекомендовать консультацию со специалистом (врачом, тренером) перед началом занятий. Только квалифицированный специалист сможет оценить состояние здоровья, выявить возможные противопоказания и разработать индивидуальную программу тренировок, учитывающую физическую подготовку и особенности организма, чтобы минимизировать риски и достичь максимальной пользы от занятий [5].

Действительно, стоит отметить, что регулярные занятия физической культурой, в частности, в тренажерном зале, оказывают заметное положительное влияние на функционирование пищеварительной системы.

Наблюдается повышение аппетита, что связано с увеличением энергозатрат организма. Улучшается деятельность желудочно-кишечного тракта, стимулируется перистальтика кишечника, что способствует более эффективному перевариванию пищи и выведению отходов.

Регулярные физические нагрузки способствуют нормализации работы желудка и кишечника, активируют деятельность печени и почек, обеспечивают правильное выделение желчи, предотвращая застой и образование камней и песка в выводящих органах. Это особенно важно для профилактики заболеваний пищеварительной системы и поддержания общего здоровья организма.

Регулярные занятия в тренажерном зале оказывают многостороннее благоприятное воздействие на уровень здоровья студенческой молодежи, выходящее за рамки физического состояния.

1. Студенты, регулярно посещающие тренажерный зал, демонстрируют более высокую социальную активность. Занятия создают платформу для общения, обмена опытом и установления новых контактов.

2. Регулярные тренировки способствуют формированию четкого распорядка дня, дисциплинируют и стимулируют желание общения, что в целом повышает общий жизненный тонус.

3. Студенты становятся более дисциплинированными, ответственными и собранными, что положительно сказывается на их учебной деятельности. Они демонстрируют большую внимательность на экзаменах, контрольных работах и семинарских занятиях.

4. Тренировки на тренажерах формируют навыки самодисциплины, необходимые для достижения поставленных целей, а также умение сотрудничать при выполнении совместных задач.

5. Регулярная физическая нагрузка становится частью повседневной привычки, что способствует поддержанию здоровья и хорошего самочувствия на протяжении всей жизни.

Все эти факторы наглядно свидетельствуют о положительном влиянии занятий в тренажерном зале на здоровье студентов и подчеркивают важную роль физической культуры в формировании гармоничной и успешной личности. Необходимо и дальше развивать и поддерживать инициативы, направленные на популяризацию занятий в тренажерном зале среди студенческой молодежи.

Подводя итог, важно подчеркнуть, что тренировки в тренажерном зале, соответствующие возрастным особенностям студентов вузов, являются эффективным инструментом для формирования основы постепенного улучшения и укрепления их здоровья, эмоциональной сферы и воли.

Однако, необходимо осознавать, что такие занятия способны оказывать как положительное влияние на состояние студентов, так и вызывать негативные эффекты при неправильном подходе.

Для минимизации рисков и достижения максимальной пользы необходимо:

1. Подробно разъяснять занимающимся воздействие различных видов физической нагрузки на организм, механизмы адаптации и возможные последствия.

2. Строго соблюдать научно обоснованные принципы организации тренировочного процесса на тренажерах, учитывать индивидуальные особенности, уровень подготовки и состояние здоровья каждого студента.

3. Обеспечивать контроль со стороны квалифицированных тренеров и, при необходимости, врачей.

Только в этом случае тренировки в тренажерном зале станут мощным инструментом для поддержания и укрепления здоровья студентов, формирования у них здорового образа жизни и раскрытия их потенциала.

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АНАЛИЗ ПАРАМЕТРОВ ВОЗОБНОВЛЯЕМЫХ ИСТОЧНИКОВ ЭНЕРГИИ

Аннотация: *В данной статье рассмотрены и проанализированы комбинированные параметры установки ветроэнергетических установок.*

Ключевые слова: *ВИЭ, ВИЭ аккумулятора, комбинированной, энергоустановок ВИЭ.*

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ANALYSIS OF RENEWABLE ENERGY SOURCES PARAMETERS

Annatation: *This article discusses and analyzes the combined parameters of the installation of wind power plants.*

Key words: *RES, RES battery, combined, RES power plants.*

Одна из основных задач в области использования энергоустановок ВИЭ это обеспечение их экономической целесообразности. Для решения этой задачи необходимо знать зависимости между технико-экономическими параметрами и показателями установок ВИЭ, что существенно усложняется учитывая переменность ВИЭ во времени и в связи с этим сложностями согласования режимов выработки и потребления энергии, а также, как правило, необходимостью в установках ВИЭ аккумулятора энергии (АБ). Для определения экономических характеристик[1].

В общем расчет экономических характеристик установок ВИЭ при известных Т-Э характеристиках может проводиться обычными способами. Однако переменность ВИЭ и в связи этим переменность энергетических характеристик требует учета этих особенностей ВИЭ в расчетах.

В на примере комбинированной ВЭУ и гелиоустановки была впервые рассмотрена особенность расчета т-э установок ВИЭ. В основе предложенного "композиционного" метода лежало рассмотрение структуры реальных колебаний производительности ветроустановки Q_B и гелиоустановки Q_E, как отдельных расчлененных компонентов исследуемого процесса Q. Можно отметить, что в работе впервые предложено проводить анализ на основе баланса "производительности", учтено в уравнениях и наличие аккумулятора и случайного характера поступления ВИЭ. Основной вывод из анализа методики это, что исследования возобновляемых источников энергии композиционным методом при водохозяйственном и энергетическом использовании этих источников должны производиться по всем месяцем за

15-20 лет, чтобы прогнозировать достаточно достоверные статистические закономерности. В общем можно отметить, что средние данные по ВИЭ (ветер и Солнце) в целом, очевидно постоянны, особенно для месяцев и сезонов, однако также очевидно, что для конкретного дня будут иметь место достаточно большие расхождения между средними и реальными величинами поступления ВИЭ[1].

На основе разработанной методики автор /10/ провел обобщенные исследования КЭУ для случаев водоснабжения пастбищ пустыни Кызылкум, электроснабжения станции радиорелейных линий связи (РРЛ) по трассе Бухара – Урал с ответвлением в г. Нукус, а также для трассы Газалкент – Чарвакская зона отдыха /11/. Расчеты проводились с целью определения объема аккумулятора воды (А) при различных величинах обеспеченности потребителя. Показано, что при 90% обеспеченности объем А воды, а также электрической АБ при 98% обеспеченности энергией РРЛ при использовании КЭУ в 3 раза меньше летом и в 5.5 раз меньше осенью, чем при раздельном использовании СЭУ и ВЭУ. Указано, что окончательный выбор параметров КЭУ следует делать путем т-э сопоставления вариантов установок. Однако, каковы при этом стоимости КЭУ и её составляющих не были рассмотрены.

В /12/ была предложена математическая модель расчета и оптимизации основных параметров КЭУ (гелио+ветер). Основное уравнение модели — это суммарные приведенные затраты на строительство и эксплуатацию КЭУ с учетом прибыли и ущерба от производства продукции. Основной полученный в работе вывод, что в зависимости от потенциала ВИЭ в конкретном районе может оказаться выгодной не КЭУ, а отдельные ВЭУ или ГЭУ.

К замечаниям по работе можно отнести следующее:

- Модель достаточно обобщенная, так в модели технические и экономические характеристики (представлены эмпирические зависимости стоимости от мощности), однако не учитываются зависимости изменения мощности и кпд энергоустановок от параметров ВИЭ. Т.е. в модели КЭУ необходимо отдельно выделять и задавать технические и экономические характеристики КЭУ и в общем связь между ними.

- в модели не выделены исходные данные – какую нагрузку должна обеспечивать КЭУ.

- важно отметить, что в работе в качестве исходных данных для ветровой и солнечной энергии использованы их многолетние средние значения, т.е. в расчетных оценках эти показатели являлись сезонными переменными, а для меньших периодов день, неделя, месяц использованы фактически их постоянные значения.

В /13/ была проведена оценка стоимости мощности ветро-солнечных КЭУ для случая постоянной нагрузки относительно средней солнечной радиации в течение дня и постоянной скорости ветра[2,3].

В на основе модели, разработанной в /13/ была проведена оценка стоимости энергии такой КЭУ. Было получено, что доля солнечной части при постоянной нагрузке и постоянной выработки энергии ветровой частью

существенно мала и не превышает 5%. Был также сделан вывод, что стоимость КЭУ в целом более высока, чем отдельных установок ВЭУ и СФЭУ, что не согласуется с выводами Махкамджанова Б.М.

В приведены оценки стоимости электроэнергии при расчетной выработке ветроэлектроустановками мощностью 60, 250 и 500 кВт, выпускаемыми серийно фирмой «Таске» (Германия) в районе 88 метеостанций Узбекистана. На основе анализа выделены районы, где ожидаемая стоимость вырабатываемой энергии находится на уровне мировых достижений; определены наиболее подходящие типы ВЭУ для ветровых условий в этих районах и эффективные способы их применения. Однако не даны стоимости мощности ВЭУ для потребителя при имеющихся диапазонах скоростей ветра, которые существенно отличаются от номинальных паспортных скоростей ветра для ВЭУ[4].

В была предложена обоснование и разработка технологической модели водно-энергетического комплекса многоцелевого назначения с комбинированным использованием энергии солнца, ветра, микрогидроэлектростанции. Предлагаемой технологическое схемы является комбинированное использование солнечной, ветровой, водной энергии при выработке электроэнергии, которая используется для бытовых нужд (освещение, радиоаппаратура и т.д.) и производственно-технологических потребностей животноводческого хозяйства: водоподъем, улучшение качества воды, электроснабжение. Работа направлена на повышение эффективности использования существующей ВЭУ, это верно, однако вопросы оптимизации самой КЭУ не рассматривались[5,6].

В была предложена выявление и оценка возможностей использования энергии солнца, ветра и малых рек для обеспечения теплоснабжения и улучшения электроснабжения негазифицируемых СНП в вышеупомянутой зоне. Определено прогнозное потребление электрической и тепловой энергии жилых домов в сельских населенных пунктах в горной Чимган – Чарвакской зоне, в том числе не подлежащих газификации до 2010 г. Рассмотрены возможности покрытия этих нагрузок с помощью солнечных фотоэлектрических установок; ветроэлектроустановок малой и средней мощности в районах, для которых репрезентативны данные наблюдений на МС Чарвакское водохранилище; малых ГЭС на р. Пскем, Угам и Чимгансай. В работе рассмотрены возможные потенциалы ВИЭ, однако экономическая оценка использования этих ВИЭ не проводилась[7].

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АНАЛИЗ СОЛНЕЧНОЙ ЭНЕРГИИ И ЕЕ ПОТЕНЦИАЛА

Аннотация: *В данной статье изучены и проанализированы потенциальная эффективность солнечной энергетики и коэффициенты ее полезной работы по регионам.*

Ключевые слова: *солнечной энергии, потенциала тепловой энергии, потенциала солнечной энергии зоны*

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ANALYSIS OF SOLAR ENERGY AND ITS POTENTIAL

Abstract: *This article studies and analyzes the potential efficiency of solar energy and its efficiency coefficients by region.*

Key words: *solar energy, thermal energy potential, solar energy potential zone*

Определения и обозначения. Технический потенциал солнечной энергии региона — это среднемноголетняя суммарная энергия, которая может быть получена в регионе от солнечного излучения в течение одного года при современном уровне развития науки и техники и соблюдении экологических норм[1].

Технический потенциал солнечной энергии представляет сумму технических потенциалов тепловой энергии и электрической энергии, получаемых соответствующим преобразованием солнечного излучения.

Технический потенциал региона представляет сумму технических потенциалов составляющих его зон /58/. Для каждой зоны используются следующие обозначения:

$W_Т$, кВт ч/год, — технический потенциал солнечной энергии;

$W_{ТТ}$, кВт ч/год, — технический потенциал тепловой энергии от солнечного излучения;

$W_{ТФ}$, кВт ч/год, —технический потенциал электроэнергии от солнечного излучения:

$$W_Т = W_{ТТ} + W_{ТФ} \qquad (1.1)$$

S_C, м^2, — площадь, которая по хозяйственным и экологическим соображениям представляется целесообразной для использования солнечной энергии; она равна части q общей площади S, остающейся после вычитания

площадей лесов, парков, сельскохозяйственных угодий и других территорий, на которых размещение установок затруднено или запрещено:

$$S_C = qS, \qquad (1.2)$$

k_T — доля площади S_C, целесообразная для установки солнечных тепловых коллекторов; $k_Ф$ — доля площади S_C, целесообразная для установки солнечных фото- электрических батарей:

$$k_T + k_Ф = 1. \qquad (1.3)$$

Значения k_T и $k_Ф$ являются специфическими для каждой зоны. В то же время на основе опыта некоторых промышленно развитых стран можно сделать оценку: q<0,01; на основе существующего соотношения между используемой тепловой энергией и электроэнергией в большинстве регионов Узбекистане можно указать примерное соотношение: , $k_T \approx 0{,}8$; $k_Ф \approx \mathbf{0}{,}2$[1].

T_{Oi}, К, - среднемесячная температура окружающей среды в дневное время (время работы установок).

Методика определения технического потенциала тепловой энергии от солнечного излучения. Расчет технического потенциала тепловой энергии производится по формуле:

$$W_{TT} = \sum_i W_{TTi}, \ i=1, 2, ...,12, \qquad (1.4)$$

где суммирование производится по всем месяцам в году; технический потенциал i-го месяца

$$W_{TT} = E_i \cdot k_T \cdot q \cdot S \cdot F \cdot \left[(\tau\alpha) - U_L \cdot (T - T_{Oi}) \cdot \cos(\varphi - \delta) \cdot \frac{t_{Ci}}{E_i} \right] \qquad (1.5)$$

где (φ, δ) — угол наклона коллектора к Земле (максимальная необходимая площадь коллекторов равна $k_T qScos(\varphi, \delta)$; t_{Ci}, ч/мес., — время работы коллекторов (число солнечных часов в месяце)[2,3].

Методика определения технического потенциала электроэнергии от солнечного излучения /58/. Расчет технического потенциала электроэнергии производится по формуле:

$$W_{TФ} = \sum_i W_{TФi}, \qquad (1.6)$$

где технический потенциал i-го месяца равен:

$$W_{TФi} = E_i \cdot k_Ф \cdot q \cdot S \cdot \eta_1 \cdot [1 - \chi(T_i - T_1)], \qquad (1.7)$$

среднемесячная рабочая температура фотопреобразователей T_i, К, равна:

$$T_i = \frac{\frac{E_i}{t_{Ci}} \cdot [\alpha - \eta_1 \cdot (1 + \chi \cdot T_1)] + \langle\lambda\rangle \cdot T_{Oi}}{\langle\lambda\rangle - \frac{E_i}{t_{Ci}} \cdot \eta_1 \cdot \chi}. \qquad (1.8)$$

Расчет технического потенциала солнечной энергии региона. В отдельную таблицу вносятся месячные значения технического потенциала, $W_{Ti}=W_{Tti}+W_{TФi}$ (i = 1,2,..., 12), а также итоговое значение технического потенциала солнечной энергии зоны, W_T. После проведения расчета

технического потенциала каждой зоны в соответствии с разделом 1 технический потенциал региона рассчитывается как сумма технических потенциалов его зон[4].

Валовой потенциал солнечной энергии, ежегодно приходящей на территорию Узбекистана (447,4 тыс. км^2), значителен и превышает энергетический потенциал всех разведанных запасов углеводородного сырья страны (см. табл. 1) /21/. Климатические, географические условия страны и прогресс, достигнутый в мире в сфере солнечных технологий, позволяют использовать энергию солнца для получения электрической и тепловой энергии в промышленно значимых масштабах. Данные многолетних наблюдений на сети актинометрических станций (АС) Узбекистана показывают, что продолжительность солнечного сияния для различных регионов изменяется от 2410 до 3090 ч в год, с колебаниями в течение суток сезонов года, с продолжительностью летом – 11 ч, зимой – 4 ч в день. Также существует разница поступления сумм солнечной радиации, составляющая 27 МДж/м^2 в сутки летом и около 7 МДж/м^2 зимой[5].

Валовой потенциал солнечной энергии оценен с учетом данных каждой АС, репрезентативных для территорий с однотипными физико-географическими условиями, и солнечной радиации при реальной облачности.

Прогнозная оценка технического потенциала энергии солнечного излучения в Узбекистане проведена на основе прогнозной оценки валового потенциала и с учетом достигнутого в мире и Узбекистане развития технологий преобразования, созданных технических средств массового изготовления, возможностей их применения в промышленно значимых масштабах[6].

Технический потенциал солнечной энергии, рассчитанный из условия создания солнечно-тепловых электростанций с общей установленной мощностью 8000 МВт оценивается в 1,29 млн т. н.э. в год.

Среди факторов, сдерживающих масштабное использования солнечной энергии для выработки электрической и тепловой энергии в Узбекистане, следует отметить следующие:

- режимные, проявляющиеся в существенной изменчивости уровня суммарной солнечной радиации как в течение сезонов года, так и суток по сезонам года, а также пространственную ее изменчивость для различных географических зон территории страны (горы, предгорья, равнины, полупустыни, пустыни); этот фактор оказывает существенное влияние на надежность энергоснабжения с использованием солнечных энергоустановок и требует применения дублирующих источников первичной энергии;

- отсутствие производств по массовому изготовлению солнечных энергоустановок с использованием местного сырья, комплектующих;

- отсутствие технологии и производств по изготовлению солнечных энергоустановок, отвечающих условиям эксплуатации в Узбекистане при резко континентальном или сухом субтропическом климате,

соответствующих требованиям нормативных документов и показателям надежности энергоснабжения[7].

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АНАЛИЗ ВЕТРОВОЙ ЭНЕРГИИ И ЕЕ ПОТЕНЦИАЛА

Аннотация: *В данной статье изучены и проанализированы потенциальная эффективность ветряная энергетики и коэффициенты ее полезной работы по регионам.*

Ключевые слова: *ветровой энергии региона, ветроэнергетической системы, потенциала возобновляемых источников энергии*

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ANALYSIS OF WIND ENERGY AND ITS POTENTIAL

Annotation: *This article studies and analyzes the potential efficiency of wind energy and its efficiency coefficients by region.*

Key words: *regional wind energy, wind energy system, potential of renewable energy sources*

Исходя из общего определения технического потенциала возобновляемых источников энергии, а также отмеченной выше специфики использования ветровой энергии, можно сформулировать следующее определение [1].

Технический потенциал ветровой энергии региона — это суммарная электрическая энергия, которая может быть получена в регионе от использования валового потенциала ветровой энергии при современном уровне развития технических средств и соблюдении экологических ограничений.

Технический потенциал региона представляет сумму технических потенциалов составляющих его зон.

Методика определения технического потенциала ВЭ. Один из основных параметров технического потенциала зоны представляет площадь территории ST, м^2, которая по хозяйственным и экологическим соображениям представляется целесообразной для использования ветровой энергии; она равна части q общей площади S, остающейся после вычитания площадей сельскохозяйственных угодий, промышленных и водохозяйственных территорий, парков, жилых, медицинских и культурных строений и др[2,3].

$$S_T = q \cdot S \qquad (1)$$

Значения q являются специфическими для каждой зоны, причем в настоящее время приняты следующие правила:

- утилизация ветровой энергии целесообразна в районах, где среднегодовая скорость ветра не ниже 5 м/с, или, в соответствии с более точным подходом, коэффициент использования установленной мощности ветроэлектрической установки большого класса мощности (более 100 кВт) оказывается не ниже 20 %;

в указанных районах для развитая ветроэнергетики может быть использовано не более 30 % территории;

- наиболее эффективной является утилизация ветровой энергии с помощью ветроэлектрических установок большой мощности (от 100 до 500 кВт).

Другими важными параметрами технического потенциала являются достижимый технический уровень современных ветроэлектрических установок (по условию - с горизонтальной осью вращения ветротурбины на высоте h = 50 м), выражающийся как максимально достижимая мощность в зависимости от скорости ветра, а также порядок размещения ветроэлектрических установок для максимального использования ветрового потока.

Зависимость мощности ветроэлектрической установки $N(v)$, Вт, с диаметром ветротурбины D, м, от скорости ветра определяется выражением:

$$N(v)=\frac{\pi}{4}\cdot D^2\cdot P(v)\cdot\eta(v)=\frac{\pi}{8}\cdot D^2\cdot\rho\cdot v^3\cdot\eta(v), \qquad (2)$$

где $\eta(v)$ — кпд установки при данной скорости ветра.

Средняя мощность ветроэлектрической установки $\langle N\rangle$, Вт, приобретает

Выражение

$$N(v)=\frac{\pi}{8}\cdot D^2\cdot\rho\sum_{i=1}^{n}v_i^3\cdot\eta(v_i)\cdot t_i \qquad (3)$$

Ее математическое ожидание имеет вид

$$M[N]=\int_0^\infty N(v)f(v)dv=\frac{\pi}{8}\cdot D^2\cdot\rho\cdot\int_0^\infty v^3\cdot\eta(v)\cdot f(v)dv \qquad (4)$$

Если ветры имеют одно преимущественное направление, например, на побережье морей, то, как и при расчете валового потенциала, оптимальная структура ветроэнергетической системы соответствует расположению ветроэлектрических установок в виде рядов, ориентированных перпендикулярно ветру и отстоящих друг от друга на расстоянии $20D$. При этом на площади S_T можно разместить $S_T/(20\cdot D^2)$ установок, так что энергия, вырабатываемая в течение года (T = 8760 ч/год) всеми установками на площади S_T, т. е. технический потенциал ветровой энергии W_T, кВт·ч/год, оказывается равной

$$W_T=\frac{\langle N\rangle}{1000}\cdot T\cdot\frac{S_T}{20\cdot D^2}, \qquad (5)$$

что при учете выражения (5) дает:

$$W_T = \frac{T \cdot S_T}{100000} \cdot \frac{\pi}{1.6} \cdot \rho \cdot \sum_{i=1}^{n} v_i^3 \cdot \eta(v_i) \cdot t_i \qquad (6)$$

Если ветры могут менять свои направления примерно равномерно по румбам, то ветроэлектрические установки целесообразно размещать в шахматном порядке с расстоянием между ближайшими станциями 20D. При этом на площади S_T можно разместить $S_T/(100D^2)$ установок, так что технический потенциал ветровой энергии W_T, кВт·ч/год, оказывается равным

$$W_T = \frac{\langle N \rangle}{1000} \cdot T \cdot \frac{S_T}{100 \cdot D^2}, \qquad (7)$$

что для (3) дает

$$W_T = \frac{T \cdot S_T}{100000} \cdot \frac{\pi}{8} \cdot \rho \cdot \sum_{i=1}^{n} v_i^3 \cdot \eta(v_i) \cdot t_i \qquad (8)$$

т. е. в 5 раз меньше потенциала (6).

В более общем случае, когда существует преимущественный сектор направлений ветра, целесообразно обеспечить специальное размещение ветроэлектрических установок на территории и, в таком случае, технический потенциал будет представляться значением промежуточным между (5) и (7).

Следует отметить, что технический потенциал ветровой энергии оказывается независящим от диаметра ветроколеса D т. е. от абсолютной мощности используемых ветроэлектрических установок[4,5].

Зависимость мощности современных ветроэлектрических установок от скорости ветра $N(v)$ включает три характеристические значения скорости: минимальное значение, или скорость включения $\boldsymbol{v_B}$, такая что при $v \le v_B$ мощности ветро-турбины не хватает даже на преодоление момента сил трения на оси турбины, т. е. $N(v) = 0$; расчетное значение v_p , такое, что при $v_B \le v \le v_p$ ветроэлектрическая установка развивает мощность и достигает номинального или установленного значения N_P ; максимальное значение, или скорость отключения, v_0, такая, что в области $v_p \le v \le v_0$ поддерживается постоянная мощность за счет регулирующих устройств. При $v \ge v_0$ энергия ветра не используется во избежание поломки установки.

В Узбекистане имеется положительный опыт использования ВЭУ серийного изготовления мощностью 3 и 6 кВт в составе пилотной солнечно-ветровой системы электроснабжения объекта телекоммуникации в предгорной зоне, а также ВЭУ мощностью 6 кВт на равнинной местности. Расчеты показали возможность создания ветроэлектростанций мощностью до 200 МВт, используя ветроэнергопотенциал наиболее перспективной зоны территории страны плато Устюрт на северо-западе Узбекистана.

Для развития ветроэнергетики в республике необходимо:

- наладить измерение скоростей ветра на высотах до 150 м в наиболее ветроэнергоперспективных зонах;

- организовать производство ветроэнергетического оборудования на местных машиностроительных заводах[6,7].

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РОЛЬ ИНДУСТРИАЛИЗАЦИИ В ЭКОНОМИЧЕСКОМ РОСТЕ УЗБЕКИСТАНА

Аннотация*: Текст рассматривает эволюцию промышленной стратегии государства, сравнивая традиционную индустриализацию с современной концепцией «Индустрия 4.0», основанной на научно-техническом прогрессе. Описываются социально-экономические изменения, связанные с индустриализацией, включая автоматизацию, урбанизацию и рост производства. Особое внимание уделено опыту Узбекистана в реализации стратегии «Узбекистан-2030», направленной на диверсификацию экономики, повышение конкурентоспособности и интеграцию в мировые рынки. Рассматриваются ключевые аспекты реиндустриализации, неоиндустриализации и постиндустриального общества, включая институциональное обеспечение, внедрение передовых технологий и развитие инфраструктуры. Приводятся примеры реформ в Узбекистане (2017–2025), включая создание свободных экономических зон, локализацию производства и переход к «зеленой экономике». Цели индустриализации включают увеличение объемов производства, экспорта и создание рабочих мест, что способствует экономической независимости и устойчивому развитию.*

Ключевые слова*: индустриализация, Индустрия 4.0, реиндустриализация, неоиндустриализация, постиндустриальное общество, экономическая стратегия, научно-технический прогресс, диверсификация экономики, конкурентоспособность, Узбекистан-2030, свободные экономические зоны, локализация производства, зеленая экономика.*

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THE ROLE OF INDUSTRIALIZATION IN THE ECONOMIC GROWTH OF UZBEKISTAN

Annotation: *The text examines the evolution of the state's industrial strategy, comparing traditional industrialization with the modern concept of "Industry 4.0" based on scientific and technological progress. It describes the socio-economic changes associated with industrialization, including automation, urbanization, and production growth. Particular attention is paid to Uzbekistan's experience in*

implementing the "Uzbekistan 2030" strategy aimed at diversifying the economy, increasing competitiveness, and integrating into world markets. Key aspects of reindustrialization, neo-industrialization, and post-industrial society are considered, including institutional support, the introduction of advanced technologies, and infrastructure development. Examples of reforms in Uzbekistan (2017–2025) are given, including the creation of free economic zones, localization of production, and the transition to a "green economy". The goals of industrialization include increasing production volumes, exports, and job creation, which contributes to economic independence and sustainable development.

Key words: *industrialization, Industry 4.0, reindustrialization, neoindustrialization, post-industrial society, economic strategy, scientific and technological progress, economic diversification, competitiveness, Uzbekistan-2030, free economic zones, localization of production, green economy.*

Сегодня промышленная стратегия государства по содержанию, масштабам, целям и задачам отличается от прежней стратегии, которая называлась «индустриализацией» и подразумевала индустриализацию. Фактически экономические процессы со временем обогащаются новым содержанием и компонентами. Исходя из этого, государственная экономическая стратегия также приобретет модернизированный и усовершенствованный вид с внедрением новых форм, методов, механизмов и проявлений, исходя из требований новой эпохи. Наступление новой эпохи развития промышленности породило концепцию «Индустрия 4.0», движущей силой которой является научно-технический прогресс. Эта концепция отражает определенный набор требований.

Индустриализация — это социально-экономические изменения, процесс перехода от аграрного общества к индустриальному. Индустриализация всегда связана с внедрением новых технологических достижений, автоматизацией процессов и расширением производства. Все это приводит к росту объемов производства, улучшению условий жизни, урбанизации, изменению структуры экономики.

Рис.1. Основные аспекты индустриализации

Индустриализация обычно сопровождается значительными изменениями в обществе и культуре и считается процессом, закладывающим основу устойчивого экономического роста.

Индустриализация — это процесс производства товаров и услуг в больших масштабах с использованием машин, работающих на новых источниках энергии.

Индустриализация означает переход государства или общества от экономики, основанной на сельском хозяйстве, к экономике, в которой промышленное развитие является основным элементом валового внутреннего продукта и основным источником занятости. Этот процесс также предполагает существование экономики свободной торговли.

Промышленная революция, начавшаяся во второй половине XVII века и продолжавшаяся до начала XIX века, стала поворотным моментом в истории человечества. Она зародилась в Великобритании, а затем распространилась на другие европейские страны, вызвав глубокие социально-экономические, технологические и культурные изменения, невиданные со времен неолита. Хотя индустриализация стала прямым результатом изобретения парового двигателя, не менее важными были правовые изменения в правах собственности, рост товарообмена и конкуренция между такими странами, как Великобритания, Германия и Франция. Основными двигателями индустриализации в те времена были горнодобывающая, металлургическая и химическая промышленность.

Этот процесс включает несколько этапов[4]:

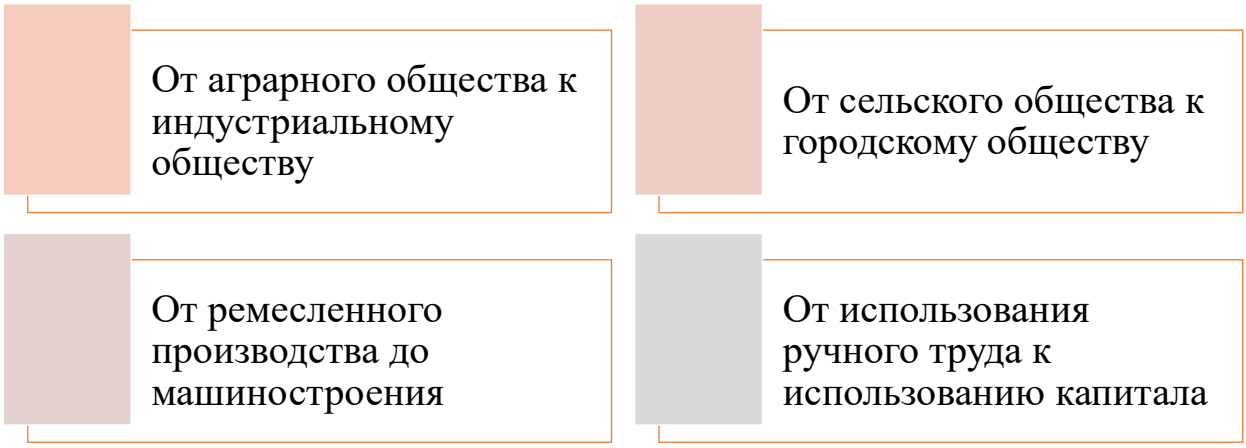

Рис.2. Основные процессы индустриализации

Термин «индустриализация» также используется для описания любого высокоразвитого общества, хотя с 1950-х годов наиболее экономически мощными странами стали те, которые достигли высокого уровня технологического прогресса.

Процесс индустриализации — это экономический, технологический и инновационный процесс, требующий постоянного увеличения социального, материального и финансового капитала общества, качественного улучшения его состава, что делает необходимым совместное движение государственной и частной собственности.

Например, в Республике Узбекистан создан Национальный консорциум промышленного Интернета для содействия использованию инновационных моделей во всех секторах экономики. Аналогичным образом Китай принял доктрину «Сделано в Китае 2025» в соответствии с технологическими требованиями концепции «Индустрия 4.0» для модернизации своих производственных отраслей.

Особое значение имеет институциональное обеспечение процессов «реиндустриализации» и «неоиндустриализации» в экономике Узбекистана, в частности в промышленных отраслях.

Постиндустриальными странами называют, как правило, те, в которых на сферу услуг приходится значительно более половины ВВП. В начале века к постиндустриальным странам относили США (на сферу услуг приходится 80% ВВП США, 2002 год), страны Евросоюза (сфера услуг — 69,4% ВВП, 2004 год), Японию (67,7% ВВП, 2001 год).

Близкими к постиндустриальной теории относятся концепции информационного общества, постэкономического общества, постмодернизма, «третьей волны», «общества четвёртой формации», «научно-информационного этапа принципа производства». Некоторые футурологи считают, что постиндустриализм — это лишь пролог перехода к «постчеловеческой» фазе развития земной цивилизации.

Термин «постиндустриализм» был введен в научный оборот в начале XX века ученым А. Кумарасвами, который специализировался на

доиндустриальном развитии азиатских стран. В современном значении этот термин впервые был применен в конце 1950-х годов, а широкое признание концепция постиндустриального общества получила в результате работ профессора Гарвардского университета Дэниела Белла, в частности, после выхода в 1973 г. его книги «Грядущее постиндустриальное общество».

Постиндустриальная теория, во многом, была подтверждена практикой. Как и было предсказано её создателями, общество массового потребления породило сервисную экономику, а в её рамках наиболее быстрыми темпами стал развиваться информационный сектор хозяйства.

В институциональной базе следует отметить два аспекта, имеющих большое значение для развития отрасли:

1. Внедрите мотивирующие и выгодные условия.

2. Соблюдайте правила и положения. Повышение внутренней и международной конкурентоспособности становится особенно необходимым при переходе к «реиндустриализации» и «неоиндустриализации» с точки зрения обеспечения конкурентоспособности промышленной продукции. Потому что для повышения внутренней конкурентоспособности отраслей промышленности государству необходимо проводить политику, расширяющую доступ на внутренний рынок через административные каналы и, по возможности, избегать протекционистских мер.

Однако обеспечение международной конкурентоспособности требует сотрудничества между государством и зарубежным сектором, требует совместных действий и комплексных стратегий. Например, привлечение высококвалифицированных промышленных рабочих, современного менеджмента, специалистов по международному маркетингу, международным юристам, международной логистике и другим направлениям. Приоритетность этих двух направлений имеет для нас решающее значение для достижения устойчивых результатов в области индустриализации.

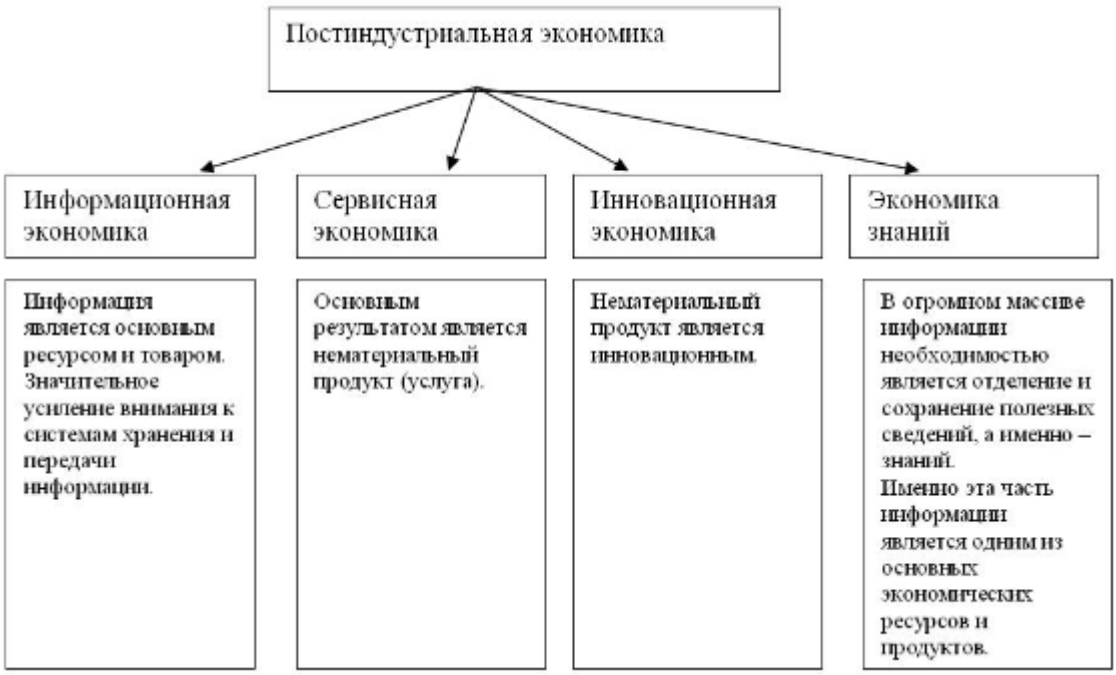

Рис. 3. Специализированные категории постиндустриальной экономики

В условиях индустриализации страны снижение противоречий между промышленными и аграрными регионами требует институциональных вмешательств, направленных на смягчение противоречий в социально-экономическом, технико-технологическом и инновационном развитии.

Промышленные секторы Узбекистана имеют сложную организационно-экономическую структуру, тесно связанную с техническими и экономическими системами, и управление промышленной стратегией должно учитывать следующие аспекты. Следует обратить внимание на такую организацию промышленного производства, которая позволит сократить различия в международном разделении труда и усилить глобальную специализацию национальных отраслей в соответствии с целями разрабатываемой промышленной политики. Наглядным примером может служить опыт Южной Кореи. Страна проводила успешную политику постепенного выхода на мировой рынок, еще больше усиливая свою региональную значимость и значение. Региональная, а значит, и локальная (не отраслевая) промышленная стратегия не сможет решить сама себя и не принесет существенных выгод. Местные рынки сильно фрагментированы для промышленных секторов и часто считаются небольшими рынками. В контексте национальной экономики реализация промышленной политики необходима для средних и крупных промышленных предприятий. Из-за отсутствия синергии и невозможности удовлетворить требования экономического роста и стратегий расширения производители не проявляют существенного интереса. Поэтому промышленную стратегию необходимо разрабатывать как на региональном, так и на глобальном уровне. Интеграция

с национальными институциональными условиями имеет решающее значение для эффективности промышленной стратегии. Другими словами, ориентация промышленной продукции на региональные и международные рынки соответствует целям институциональной интеграционной деятельности.

Значимость индустриализации экономики Узбекистана в диверсификации экономики и повышении глобальной конкурентоспособности наглядно продемонстрирована в конкретных реформах и проектах, реализованных в 2017–2025 годах.

Индустриализация позволила перейти от экономики, основанной на сельском хозяйстве и сырье, к производству продукции с высокой добавленной стоимостью, расширив экспортные возможности и усилив конкуренцию на мировых рынках. Так, как отмечалось на круглом столе 2017 года на тему «Дальнейшая диверсификация и укрепление конкурентоспособности экономики Узбекистана», были запущены такие новые отрасли, как нефтегазовая, химическая, автомобилестроение, производство стройматериалов, фармацевтика, текстильная, что позволило увеличить объемы промышленного производства в 4,6 раза и довести среднегодовой темп роста отрасли до 8,9 процента в 2007-2017 годах.

Принятая 11 сентября 2023 года на основании Указа Президента Республики Узбекистан № 158 «О Стратегии развития Узбекистана до 2030 года», данная стратегия отражает 100 важных целей по 5 приоритетным направлениям. Данный документ был разработан на основе накопленного опыта, международной экспертизы и результатов общественных обсуждений. В частности, поставлены задачи по устойчивому развитию промышленного сектора, эффективному использованию местной сырьевой базы и развитию промышленности на основе передовых технологий, развитию «драйверных» отраслей промышленности и полной загрузке промышленного потенциала регионов, доведению объема добавленной стоимости в отрасли до 45 млрд долларов США и созданию 2,5 млн высокооплачиваемых рабочих мест.

Кроме того, согласно утвержденным целям в 2023 году в рамках стратегии «Узбекистан-2030» планировалось увеличить валовой внутренний продукт (ВВП) до 160 млрд долларов США и увеличить доход на душу населения до 4 тыс. долларов США. Для этого были созданы свободные экономические зоны (СЭЗ) и малые промышленные зоны, особое внимание уделялось привлечению иностранных инвестиций. Например, в 2019 году была разработана концепция развития СЭЗ, модернизированы автомобильные дороги, сети водоснабжения и канализации, что создало благоприятные условия для инвесторов.

Зависимость от импорта была снижена за счет программ локализации в промышленных секторах. Например, в рамках программы локализации, стартовавшей в 2000 году, было налажено производство бытовой электроники и современной сельскохозяйственной техники, что позволило обеспечить внутренний рынок конкурентоспособной продукцией. В то же время была принята стратегия перехода к «зеленой экономике» за счет расширения

использования возобновляемых источников энергии, что позволило сократить выбросы парниковых газов на 10 процентов от уровня 2010 года к 2030 году.

Еще один конкретный пример: прогнозируется, что рост ВВП в 2025 году составит 6,2 процента, что будет обусловлено быстрым развитием промышленности и улучшением транспортной и логистической инфраструктуры. Эти реформы усилили глобальную конкурентоспособность страны за счет интеграции экономики Узбекистана в мировые транспортные сети и увеличения доли экспортно-ориентированной продукции. В результате индустриализация стала важным фактором обеспечения экономической независимости Узбекистана, повышения уровня жизни населения, достижения целей устойчивого развития, определенных в стратегии «Узбекистан-2030».

Основными целями индустриализации в контексте экономики Узбекистана являются увеличение объемов производства, расширение экспортного потенциала и укрепление экономической независимости. В рамках этих целей в 2017–2025 годах были увеличены производственные мощности в таких секторах, как автомобилестроение, химия, текстиль, производство строительных материалов. Например, в 2019 году через свободные экономические зоны было привлечено 1,5 млрд долларов иностранных инвестиций, что позволило увеличить экспорт на 15%. В то же время долгосрочные цели включают повышение уровня жизни населения за счет устойчивого экономического роста и создания рабочих мест. Так, в рамках стратегии «Узбекистан-2030» в 2023 году создано более 500 тысяч новых рабочих мест, что способствовало снижению уровня бедности с 14 до 10 процентов. Эти цели служат обеспечению экономической диверсификации и глобальной конкурентоспособности.

Цели индустриализации Узбекистана на 2017–2025 годы направлены на увеличение мощностей промышленного производства, внедрение современных технологий и эффективное использование местных ресурсов. Так, в 2019 году в рамках «Программы локализации» было запущено более 200 новых производственных линий, что позволило довести уровень использования местного сырья до 60 процентов, что снизило зависимость от импорта на 20 процентов. В целях внедрения современных технологий в текстильной отрасли в 2022 году построены автоматизированные фабрики, работающие по принципам «Индустрии 4.0», что позволило повысить эффективность производства на 30%. Например, за счет использования местных ресурсов расширены мощности переработки медных и золотых рудников Сурхандарьинской области, а объем экспорта в 2024 году достигнет 2 млрд долларов США.

Особое внимание уделено развитию энергетической, транспортной и цифровой инфраструктуры в качестве дополнительных задач. В 2023 году введено в эксплуатацию 10 новых солнечных и ветровых электростанций на основе возобновляемых источников энергии, что позволило сократить отключения электроэнергии на 40%.

В транспортной сфере в рамках модернизации АО «Узбекистон темир йуллари» в 2021–2025 годах построено 500 км новых железнодорожных линий, что позволило сократить расходы на логистику на 15%. В цифровой инфраструктуре к 2025 году будет полностью внедрена система «Электронное правительство», а цифровизация систем управления на промышленных предприятиях достигнет 70%, что позволит повысить эффективность работы. Реализация этих задач способствовала выводу экономики Узбекистана на мировой уровень конкурентоспособности.

Стратегия развития нового Узбекистана на 2022-2026 годы предусматривает следующие меры и проекты по модернизации действующих предприятий и созданию новых предприятий, выпускающих продукцию с высокой добавленной стоимостью:

Рис.4. Основные направления стратегии развития промышленности Узбекистана на 2022–2026 годы

Кроме того, планируется стимулировать экспорт готовой продукции на европейские рынки, а также реализовать программы по повышению эффективности производства и производительности труда, принять меры по обучению кадров.

Заключение

В условиях глобализации мировой экономики и формирования цифровой экономики в нашей стране особое внимание уделяется таким вопросам, как обеспечение конкурентоспособности национальной экономики, эффективная организация производства и повышение эффективности управления в отраслях и секторах, эффективная организация корпоративного управления на предприятиях и в акционерных обществах, компаниях и фирмах, эффективная организация производства, разработка стандартов и кодексов корпоративного управления в практике предприятий, применение

передового зарубежного опыта повышения конкурентоспособности промышленных предприятий в развитии экономик стран.

Изменения во всех сферах жизни общества в Узбекистане ускоряются и расширяют свои масштабы. Мощные масштабы строительства в промышленных отраслях послужат обеспечению социального благополучия в ближайшем будущем и станут важным фактором экономической стабильности и роста. Таким образом, стратегия индустриализации приведет к постоянному укреплению позиций наших национальных промышленников на региональных и международных рынках.

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ОСОБЫЕ МЕХАНИЗМЫ ЗДОРОВЬЯ СОЦИАЛЬНОЙ И ДУХОВНОЙ СРЕДЫ В МАХАЛЛЯ

Аннотация: *В статье подчеркивается необходимость оказания всесторонней поддержки молодежи Узбекистана, обеспечения ее прав и свобод, своевременного выявления проблем, связанных с данной темой, и их объективного выражения в рамках улучшения социальной и духовной среды в микрорайонах.*

Ключевые слова: *Вертикальная система, духовная среда, неорганизованная молодежь, государственная политика в отношении молодежи, «Один интеллектуальный духовный покровитель для одного квартала», «Концепция непрерывного духовного образования».*

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SPECIFIC MECHANISMS OF SOCIAL AND SPIRITUAL ENVIRONMENT HEALTH IN NEIGHBORHOODS.

Annotation: *The article highlights the need to provide comprehensive support to the youth of Uzbekistan, ensure their rights and freedoms, identify problems related to the topic in a timely manner and express them objectively within the framework of improving the social and spiritual environment in the neighborhoods.*

Key words: *Vertical system, spiritual environment, unorganized youth, state policy regarding youth, "One intellectual spiritual patron for one neighborhood", "Concept of continuous spiritual education".*

Институт соседства, основанный на демократическом, свободном гражданском обществе в Новом Узбекистане, сегодня признан странами мира как система национального управления. Его правовая основа полностью определена в статье 127 нашей Конституции, в которую на основании референдума, состоявшегося 30 апреля 2023 года, были внесены изменения: «В поселках, селах и селах, а также городах собрания граждан в кварталах г. города, села и села являются органами самоуправления и избирают председателя. Органы самоуправления граждан не входят в систему органов государственной власти и решают вопросы местного значения самостоятельно, в соответствии с законом, исходя из интересов граждан, исторических особенностей развития, а также национальных ценностей. местные обычаи и традиции. имеет право решать. Государство создает необходимые условия для осуществления деятельности органов самоуправления граждан, помогает им в реализации установленных законом полномочий. Порядок избрания органов самоуправления граждан, организация их деятельности и их полномочия определяются законом» [1].

Трудно представить институт соседства не только в системе национального управления, но и воспитания молодежи района и любых связанных с ними вопросов без вмешательства соседства. Также тот факт, что сегодня 60% населения нашей страны составляет молодежь, свидетельствует о том, что этот вопрос является одной из приоритетных задач политики нашей страны. Подчеркнув, что повышенное внимание к молодежной политике достигло своего пика с 2017 года, в выступлении Президента Шавката Мирзиёева на IV съезде Молодёжного общественного движения «Камолот» в марте 2019 года были выдвинуты вопросы в пяти важных инициативах Президента, направленных на содержательное организации свободного времени, в законах «О государственной политике в отношении молодежи», а также «О мерах по коренному совершенствованию системы работы с молодежью в микрорайонах» PQ-92 – задачи, решения которых представлены, служат основой для нашей мнение. Анализ литературы по теме. В годы независимости особое внимание уделяется дальнейшему развитию микрорайона и его процветанию. Уважение и последовательное продвижение национальных и духовных ценностей, сформировавшихся в кварталах, популяризация лучших обычаев и традиций нашего народа, изучение и исследование роли квартала в воспитании молодежи в духе национальной независимости входят в число наиболее актуальных тем. .

Методология исследования. Постановление Президента Шавката Мирзиёева от 19.01.2022 № PQ-92 «О мерах по коренному совершенствованию системы работы с молодежью в микрорайонах»; Данное решение предусматривает четыре основные цели: внедрение новых механизмов управления работой с молодежью; создание вертикальной системы работы с ними; решение проблем молодежи непосредственно в районах; дальнейшее повышение эффективности духовно-просветительской и воспитательной работы в образовательных учреждениях [2]. Для

достижения этой цели уделяется внимание наиболее проблемному моменту системы работы с молодежью в Узбекистане. Создается уникальный механизм охвата молодых мужчин и женщин района. Именно так можно оценить введение должности молодежного лидера в микрорайонах. Анализ и результаты. В настоящее время 32 процента населения нашей страны, или 10 миллионов, составляют молодые люди в возрасте до 30 лет [3]. Отсюда ясно, что необходимо обеспечить здоровую социальную и духовную среду среди молодежи до 30 лет, бороться с преступностью, укреплять ее идеологический иммунитет. «Мы создаем совершенно новую систему и новую модель государства, нам нужны люди, которые дадут жизнь этой модели... Мы рассчитываем на молодое поколение, которое сможет преодолеть нынешние трудные времена. Мы откроем им все пути, предоставим им полную возможность для их работы»[4]. В соответствии с Указом Президента «О мерах по выводу системы работы с людьми на новый уровень», новая система базируется на в каждом микрорайоне будет внедрен принцип «Процветающее и безопасное микрорайон». Всестороннее содействие полной и эффективной реализации принципа «Благополучное и безопасное соседство» в обществе, налаживание тесного сотрудничества граждан с органами самоуправления в улучшении социально-духовной среды в семьях и микрорайонах – основная цель министерства. .. это одна из задач и мероприятий.

С точки зрения местоположения каждого микрорайона, условий быта его жителей и географического положения целесообразно организовывать интересы и свободное время молодежи исходя из основного источника существования микрорайона. Кроме того, роль профессоров и учителей района несравненна в том, чтобы направить молодежь на правильный путь и познакомить ее с черным и белым. Прикрепление профессоров и преподавателей для молодежи района на базе общины имеет положительный эффект с педагогической точки зрения. В этом плане для нашей благополучной жизни в Новом Узбекистане важна наша молодежь, духовно зрелая, физически сильная, имеющая собственное независимое мнение, особенно насыщенное чувством принадлежности к обществу. Стоит отметить слова британского государственного деятеля и политика Уинстона Черчилля: «Чтобы быть хорошим, нужны перемены, а чтобы быть лучшим из лучших, нужно больше перемен»[5]. Тот факт, что глава нашего государства неоднократно подчеркивает, что в сегодняшнее опасное время всем нужно быть начеку, начинать перемены в первую очередь, является доказательством того, что сегодня никто не имеет права сидеть сложа руки в кварталах.

Выводы и предложения. В заключение следует отметить, что Махалля испокон веков была колыбелью добра и просвещения для нашего народа. Это также место, которое объединяет все живущие здесь народы своими национальными традициями и ценностями. Кроме того, район является социальным и духовным спутником и поддерживает население во всех аспектах. По словам президента Шавката Мирзиёева, «Соседство – это светлое лицо и зеркало совести нашего общества»[6], поэтому можно понять,

что здоровая духовная среда в кварталах во многом является признаком совести соседства.

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РОЛЬ ИННОВАЦИОННЫХ АУТСОРСИНГОВЫХ УСЛУГ В МИРОВОМ ОПЫТЕ И ВОЗМОЖНОСТИ ИХ ПРИМЕНЕНИЯ В НАЦИОНАЛЬНОМ КОНТЕКСТЕ

Аннотация*: В статье рассматривается международный опыт внедрения инновационного аутсорсинга, его влияние на глобальные бизнес-процессы и возможности применения в условиях Узбекистана. На основе анализа кейсов США, стран ЕС, Китая и Индии выявлены ключевые модели взаимодействия между клиентами и провайдерами. Рассматриваются глобальные тренды, включая ESG, цифровую трансформацию и коаутсорсинг, и предложены рекомендации по локализации передового опыта.*

Ключевые слова: *инновационный аутсорсинг, цифровая трансформация, экспорт услуг, коаутсорсинг, аутсорсинг в Узбекистане*

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THE ROLE OF INNOVATIVE OUTSOURCING SERVICES IN WORLD EXPERIENCE AND THE POSSIBILITIES OF THEIR APPLICATION IN THE NATIONAL CONTEXT

Abstract: *The article examines international experience in implementing innovative outsourcing, its impact on global business processes and the possibilities of application in the context of Uzbekistan. Based on the analysis of cases in the USA, EU countries, China and India, key models of interaction between clients and providers are identified. Global trends, including ESG, digital transformation and co-outsourcing are considered, and recommendations for localizing best practices are offered.*

Keywords*: innovative outsourcing, digital transformation, export of services, co-outsourcing, outsourcing in Uzbekistan*

В условиях современного стремительного развития технологий инновационный аутсорсинг стал одним из основных инструментов адаптации бизнес-среды к вызовам глобализации, цифровизации и изменениям структуры занятости. В одних странах этот механизм был внедрен как ответ

на дефицит внутренних ресурсов, в других он формируется в рамках национальных стратегий стимулирования экспорта услуг, привлечения инвестиций и формирования инновационных экосистем.

Мировая практика показывает высокую степень разнообразия инновационных моделей аутсорсинга, что обусловлено различиями в уровне цифровой зрелости, институциональной среде, характере рыночных отношений и доступе к высококвалифицированным кадрам. Некоторые страны полагаются на государственное предоставление ИТ-услуг по запросу, другие же фокусируются на разработке уникальных цифровых решений с высокой добавленной стоимостью.

Интересно изучить, какие структурные, организационные и технологические подходы наиболее эффективны в разных странах, как выстраиваются отношения между клиентом и поставщиком, какие секторы бизнеса чаще всего передаются на аутсорсинг и какие уроки могут быть полезны для стран с развивающейся экосистемой аутсорсинга, в том числе и для Узбекистана.

В статье представлена общая и аналитическая информация о технологических решениях, бизнес-моделях и институциональных условиях, способствующих успешному внедрению инновационного аутсорсинга в мировую экономику.

Для более полного анализа мирового опыта инновационного аутсорсинга рассмотрим общие цифры состояния мирового рынка инновационного аутсорсинга в 2020-2025 гг.

Годы	Общий рынок (ИТ+BPO), млрд. $	ИТ-аутсорсинг млрд. $	BPO млрд. $
2020	-	-	232.3
2021		245,9	-
2022		261,9	261,9
2023		471.0	315.2
2024	672.7	744,6	302.6
2025	854.6	651,5	340,9

Из таблицы видно, что общий объем рынка в 2024 году составил 672,7 млрд долларов США, а к концу 2025 года прогнозируется, что этот показатель достигнет 854,6 млрд долларов США. В этой структуре рынка мы видим устойчивый рост показателей ИТ-аутсорсинга и аутсорсинга бизнес-процессов (BPO), причем ИТ-аутсорсинг становится значимой частью рынка. Это также наглядно видно на графике ниже.

Инновационного аутсорсинга не ограничивается передачей рутинных процессов внешним провайдерам, но также включает передачу интеллектуально требовательных и высокотехнологичных процессов . К технологическим функциям, требующим интеллектуального потенциала и отличающимся высокой сложностью, относятся создание и поддержка ИТ-продуктов, анализ больших объемов данных (Big Data), проектирование цифровых платформ, машинное обучение и искусственный интеллект, управление цифровыми цепочками поставок, создание пользовательских интерфейсов (UI/UX), а также кибербезопасность как услуга (Security-as-a-Service). Таким образом, современная среда привела к появлению таких направлений аутсорсинга, как инновационный и кооперативный.

В рамках изучения мирового опыта были выявлены мировые тенденции инновационного аутсорсинга (тенденции, затрагивающие различные аспекты жизни, экономики, культуры и технологий). Ниже мы представляем эти тенденции в виде аналитической таблицы.

Тенденции	Состав и действие
Цифровая трансформация	Более 70% мировых компаний передают на аутсорсинг цифровые функции, включая ИИ, облачные решения и практики DevOps.
Переход к моделям, основанным на Vflue (ценностно-ориентированным)	Клиенты требуют не только обслуживания, но и ключевых показателей эффективности, инноваций и решений проблем.
Рост распределенной занятости	Удаленная работа и гибкие контракты также расширяют возможности аутсорсинга для новых профессий, таких как дизайнеры, специалисты по обработке данных и программисты.
Аутсорсинг как элемент ESG (экологическое, социальное и корпоративное управление)	Многие компании переходят на процессы, обеспечивающие экологическую чистоту и устойчивость в рамках политик ЦУР и ESG.

Если остановиться на аналитических данных в таблице выше более подробно, то следует более подробно рассмотреть мировые тенденции, которые показывают современный облик инновационного аутсорсинга, который выражается не только в технологических терминах, но и в сложных

изменениях логики и последовательности взаимодействий заказчика и подрядчика на этапе разработки. В отличие от традиционных моделей, которые фокусировались на стандартных операциях для снижения издержек, современные стратегии аутсорсинга стали частью долгосрочного инновационного развития компаний и отрасли в целом. При этом одним из наиболее значимых мировых трендов инновационного аутсорсинга является тенденция смещения внимания с экономии затрат на инновационные ценности, а это значит, что если раньше основным мотивом аутсорсинга была экономия (особенно в части персонала и инфраструктуры), то сегодня главным фактором становится своевременное внедрение инноваций. Клиент ищет не только внешнего подрядчика, но и технологического партнера, способного внедрять новые идеи, решения и методы. Это особенно актуально в отраслях, где важна скорость внедрения инноваций — IT, FinTex, маркетинг, телекоммуникации. В русле этой мировой тенденции мы рассматриваем тенденцию увеличения спроса на аутсорсинг высоких технологий (High-End ITO) . Во всем мире увеличивается доля аутсорсинга, связанного с развитием искусственного интеллекта, аналитики больших данных, блокчейна, практик DevOps, облачной архитектуры и кибербезопасности. Особенно это заметно в США, Израиле и Евросоюзе, где компании передают на аутсорсинг сложные научные процессы, требующие высокой квалификации. Еще одна мировая тенденция, которую мы рассмотрели в обобщенном виде, — это тенденция расширения спектра функций аутсорсинга. Если в 2000-х годах основной упор делался на ИТ-поддержку, бухгалтерию и колл-центры, то сегодня функции аутсорсинга расширились и включают аналитику, маркетинг, UX/UI-дизайн, создание цифровых продуктов, проверку гипотез и даже процессы НИОКР. В данном случае мы наблюдаем зарождение новой концепции «инновационного ко-аутсорсинга» (innovative hamoutsourcing), которая предполагает не только издателя в качестве исполнителя, но и кооперацию. Продолжая анализировать мировые тенденции, остановимся на тенденции географического перераспределения ресурсов, которая отражает глобализацию мира . Многие компании предпочитают переходить от модели «один аутсорсер в одной стране» к модели глобально распределенных команд. Например, разработка создается в Польше, тестирование проводится на Филиппинах, дизайн пользовательского интерфейса разрабатывается в Бразилии, а стратегический менеджмент — в США. Это повышает устойчивость и стойкость бизнеса к рискам, особенно в условиях политической и экономической нестабильности в определенных регионах. В рамках фокусировки на экологических и социальных процессах наметилась тенденция к интеграции ESG и устойчивости в затраты на аутсорсинг. Многие крупные корпорации в Евросоюзе и США включили экологическую, социальную и корпоративную устойчивость в свои критерии выбора партнеров по аутсорсингу. Это требует от подрядчиков соблюдения экологических стандартов, обеспечения социальной ответственности, прозрачности и конфиденциальности персональных данных. Влияние пандемии COVID-19 и тенденция к

удаленной работе . Как мы все знаем, период пандемии ускорил массовую информатизацию бизнеса, и как следствие, спрос на аутсорсинг многократно вырос по сравнению с доковидным периодом. Компании, которые ранее к нему не прибегали, начали активно передавать задачи из HR в управление клиентской базой, которые выполняются удаленно, внешним провайдерам. Это, в свою очередь, привело к расширению рынка, в основном в регионах страны с дешевой рабочей силой, и росту количества мелких аутсорсинг-провайдеров. В результате ускорения многих повторяющихся процессов появилась еще одна тенденция — тенденция автоматизации процессов с использованием RPA и AI . Вместо сотен и даже тысяч повторяющихся и утомительных процессов, выполняемых альтернативными системами, инновационный аутсорсинг упростил процессы с использованием технологий робототехники (RPA) и искусственного интеллекта. Это привело к созданию новой гибридной модели — модели «человек + AI», которая предполагает обработку определенных частей задач с помощью алгоритмов и частичное их выполнение удаленно командой людей. В то же время, когда идет процесс оцифровки всех аспектов, наблюдается тенденция повышения требований к безопасности и конфиденциальности, в том числе и к обеспечению информационной безопасности . Как известно, риск кибератак и утечки данных увеличивается по мере увеличения объема передачи цифровых данных. В ответ многие страны (в основном Евросоюз и США) вводят новые правила (GDPR, HIPAA, ISO 27001 и т. д.), которые требуют от поставщиков аутсорсинга соблюдения строгих стандартов. Это приводит к повышению спроса на поставщиков услуг кибербезопасности и аутсорсинга, сертифицированных по международным стандартам.

Таким образом, мировые тенденции в области инновационного аутсорсинга свидетельствуют о глубоком изменении его роли в мировой экономике. Он все чаще воспринимается как механизм совместного создания большего количества инноваций, связанного с простой передачей меньшего количества функций. Для стран с формирующимся рынком, таких как Узбекистан, это открывает новые возможности для адаптации передовых международных практик, формирования конкурентоспособной экспортной модели, стимулирования цифровизации малого и среднего бизнеса.

Статистические данные подтверждают, что основными драйверами мирового рынка инноваций являются страны Азии, особенно Китай, Индия, а также страны Юго-Восточной Азии, особенно Сингапур. Это означает, что у Узбекистана есть возможность присоединиться к этой глобальной цепочке.

Изучение передового международного опыта внедрения инновационного аутсорсинга, особенно государственной поддержки цифровой экономики, малого бизнеса и ИТ-инфраструктуры, актуально для активно развивающегося Узбекистана. Однако простое копирование зарубежных моделей не всегда эффективно — важно учитывать национальные особенности, институциональную зрелость и готовность рынка. С этой точки зрения задача адаптации международного опыта

заключается в грамотной локализации передового опыта с учетом реальных условий страны.

Для применения международного опыта на практике необходимо изучить имеющийся потенциал в сфере инновационного аутсорсинга в Узбекистане. Узбекистан имеет ряд стратегических преимуществ, которые создают необходимые условия для успешной адаптации международного опыта. Эти преимущества

географическое положение - возможность работать с Европой и Азией (особенно в сфере ИТ и BPO услуг),

молодой и технологически активный население - более 60% населения составляет молодежь в возрасте до 30 лет,

Активное развитие ИТ-сектора посредством таких институтов, как ИТ-парк, Цифровой город, Технопарк, Инновационный центр Мирзо Улугбека ,

Правительственные инициативы включают программу «Цифровой Узбекистан 2030», поддержку стартапов и налоговые льготы для ИТ-компаний.

В последующих разделах данной исследовательской работы мы рассмотрим перечисленные ниже стратегические преимущества во взаимосвязи друг с другом и рассмотрим методы их эффективного и рационального использования при организации и развитии инновационного аутсорсинга. В качестве результата и эффекта социально-экономических, финансово-экономических и нормативно-правовых реформ, реализованных и реализуемых в Узбекистане, можно привести следующие примеры первых шагов по формированию экосистемы регионального аутсорсинга и предложения ИТ-услуг.

Инициатор/Организатор	Функция и важность
Парк собак Узбекистана i	Предоставляются налоговые льготы и поддержка экспорта Технопарк
«MyID», «EPGU» и другие .	Развитие цифровых государственных услуг с участием местных сообществ
Стартап-ускоритель	Поддержка молодых команд и аутсорсинговые решения
Узинфоком, Технопарк	Авторитет в сфере государственных и частных ИТ
IT -студии и фрилансеры	Цифровые решения для малого бизнеса путем аутсорсинга

Бизнес-процессы в Узбекистане, которые мы все наблюдаем, показывают, что формирование экосистемы аутсорсинга находится на начальном этапе. Однако уже на данном этапе можно четко выделить ряд инициатив и институтов, которые в будущем послужат основой для масштабного развития инновационного аутсорсинга. Эти инициативы отражают стремление государства к цифровизации экономики, поддержке малого бизнеса, стимулированию экспортного потенциала в сфере интеллектуальных услуг.

Все вышеперечисленные случаи доказывают, что инновационный аутсорсинг может стать источником технологического суверенитета и экспортной устойчивости государства, если он будет разумно поддерживаться государством и специалисты будут подготовлены на должном уровне.

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АНДИЖОН ВИЛОЯТИ ТОҒ ОЛДИ ВА АДИР ҲУДУДЛАРИНИ ЛАНДШАФТ АСОСИДА ТУРЛАРГА АЖРАТИШ ВА РАЙОНЛАШТИРИШ

Аннотация: *ушбу мақолада Андижон вилоятининг тоғ олди ва адир ҳудудларида жойлашган маъмурий туманлари ландшафт асосида районлаштирилган ва ГИС асосида ландшафт харитаси ишлаб чиқилган.*

Калит сўзлар: *ландшафт, районлаштириш, тоғ олди ва адир ҳудудлари, геоморфологик (орографик), иқлимий, тупроқ ва гидрологик кўрсаткичлар, конуссимон ёйилмалари ва конис оралиға ботиқлари, дарё поймалари.*

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DIVISION AND ZONING OF MOUNTAIN AND HILL AREAS OF ANDIJAN REGION INTO TYPES BASED ON LANDSCAPE

Abstract: *in this article, the administrative districts located in the foothills and hills of Andijan region are regionalized on the basis of landscape and a landscape map is developed on the basis of GIS.*

Keywords: *landscape, zoning, foothills and foothills, geomorphological (orographic), climatic, soil and hydrological indicators, conical expanses and depressions between mines, river courses.*

Кириш. Ер ресурсларидан фойдаланишга таъсир этувчи табиий-ландшафт омилларининг назарий тахлилидан ҳамда ўзига хос берк ҳавза сифатидаги Фарғона водийсининг минтақавий хусусиятларидан келиб чиқиб, геоморфологик (орографик), иқлимий, тупроқ ва гидрологик кўрсаткичлар устувор омил сифатида танлаб олинди ва ўрганилди.

Ердан фойдаланишга таъсир этувчи ҳудуднинг орографик кўрсаткичларидан тоғли минтақалар учун жойнинг денгиз сатҳидан баландлиги, реълефнинг нишаблиги, парчаланганлиги каби кўрсаткичларга эътибор қаратилди.

Асосий қисим. Фарғона водийси рельефи учун хос бўлган хусусият унинг зоналлиги бўлиб, турли номлар билан аталсада, унинг асосида жойнинг денгиз сатҳидан баландлиги ётади. Ҳудуд зоналлиги (А.Абулқосимов, 2004, Ю.Султонов, 1994), поғонасимонлиги (Р.Қўзиев, 2004, О.Абдуғаниев, 2008), баландлик минтақалари (К.Боймирзаев, 2004, Ю.Аҳмадалиев, 2007),

микрозоналарга (О.Қўзибоева, 2006, Абдувалиев, 2021) бўлиниш каби кўрсаткичлар асосини жойнинг денгиз сатҳидан баландлик ташкил этади. Юқоридаги маълумотларна асосланган ҳолда ГИС техтонологиясидан фойдаланиб, Андижон вилоятининг ҳудуди уч қисимга 450 метиргача текисликлар 31.1%, 450-1200 метиргача тоғ олди ва адир ҳудуди 68.7%, 1200 метирдан баланд қисми тоғлар 4%га ажратилди. **(1-расим)**

Вилоятдаги 11 та маъмурий туман ва Андижон шахри 450-1200 м. баландлик оралиғидаги ҳудудларга тўғри келади (1-жадвал). Бу вилоят майдонининг 68.7 фоизини ташкил қилади.

Фарғона водийсининг энг сўнгги замонавий ландшафтларини акс эттирувчи картаси А.Д.Никонорова (2015) томонидан ГИС ёрдамида 1:750000 масштабда ишланган бўлиб, унда Фарғона водийси (тўлиқ ҳудуди) ҳудуди 6 та ландшафт синфи ва 11 та ландшафт синфчасига ажратилган. Барча синфлар бир ёки икки синфчага бўлинган. “Ўздеверлойиха” институти Андижон комплекс-лойихалаш филяли томонидан тузилган Андижон вилояти тупроқ-географик раёнлар схематик картаси билан А.Д.Никонорованинг ландшафт картаси қиёсланса ҳамда улар ҳозирги маъмурий туманлар ҳудуди билан умумлаштирилса тупроқлар, ландшафт турлари юқоридан қуйига қараб фарқланиш кузатилади (1-жадвал).

1-жадвал
Андижон вилояти ландшафт минтақаларида қишлоқ туманларининг жойлашуви

№	Ландшафт минтақалари (А.Никонорова бўйича)	“Ўздеверлойиха” институти Андижон комплекс-лойихалаш филяли томонидан тузилган Андижон вилояти тупроқ-географик раёнлар схематик картаси бўйича	Қишлоқ туманлари ва шаҳарлар
1.	Паст тоғлар	Тўқ тусли ва типик бўз тупроқлар	Хўжаобод, Булоқбоши, Қўрғонтепа,Марҳамат
2.	Андижон-Қува адирлар тизмаси	Типик бўз тупроқлар	Андижон, Хўжаобод, Булоқбоши, Жалолқудуқ, Асака, Марҳамат
3.	Тоғ олди текисликлари	Типик бўз тупроқлар	Қўрғонтепа,
4.	Ойим-Хўжаобод-Мархамат адир оралиғи ботиқлари	Ўтлоқи бўз тупроқлар	Хўжаобод, Булоқбоши, Қўрғонтепа, Жалолқудуқ, Марҳамат,
5.	Конус ёйилмалари	Типик бўз,Оч тусли бўз ва кўн ус этакларида ўтлоқи саз тупр оқлар ва ботқоқ ўтлоқи тупроқ лар	Избоскан, Пахтаобод, Шахрихон, Асака, Андижон тумани, Қўрғонтепа, Жалақудуқ, Хўжаобод, Булоқбоши
6.	Дарё поймалари	Ўтлоқи ва шўр ботқоқ аллювиал тупроқлар, типик шўрхоклар, ўтлоқи саз тупроқлар, қумли ва қумоқ тупроқлар	Избоскан, Пахтаобод, Андижон тумани, Олтинкўл, Асака, Жалақудуқ, Қўрғонтепа

Жадвал А.Никонорова ва “Ўздеверлойиха” институти Андижон комплекс-лойихалаш филяли томонидан тузилган Андижон вилояти тупроқ-географик раёнлар схематик картаси маълумотлари асосида муаллиф томонидан ArcGIS дастурида ишлаб чиқилган.

Қорадарё, Майлисой ва Аравонсой **дарё поймаларида** асосан Боз ўтлоқи, ўтлоқи саз ва ботқоқ ўтлоқи аллювиал тупроқлар тарқалгани билан характерланади.

Конуссимон ёйилмалари ва конис оралиға ботиқлари Аравонсой, Шахрихонсой, Оқбура, Андижонсой, Мойлисой каби дарё ва сойларнинг киритилади. А.Мақсудовнинг (1990) маълумотларига кўра бу ҳудудда воҳа ландшафтлари шаклланиб, тупроқнинг энг унумдор қопламлари вужудга келади. Агроирригацион қатламнинг қалинлиги мазкур ҳудудларда аҳоли яшаши ва ишлаб чиқаришни ривожлантиришда энг юқори баллни ташкил этади. Ҳудуд релъефи қишлоқ хўжалиги юритиш учун қулай бўлиб, ер ости ва ер усти оқар сувларининг ҳаракати яхши дренаж холатини таъминлайди.

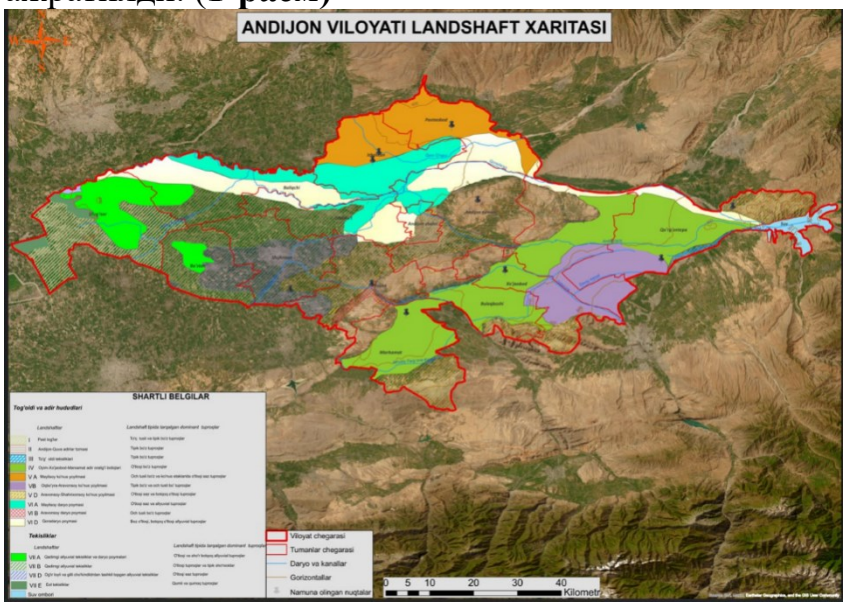
Вилоятнинг **адир ландшафтлари минтақаси** П.Баратовнинг (1996) таърифи бўйича мутлоқ баландлиги 400-500 м дан 1200 м гача, айрим жойларда эса 1500 м гача бўлган, ўзига хос гипсометрик ҳудудлар бўлиб, ҳосил бўлиши жиҳатдан ёш рельеф шакллари ҳисобланади. Ҳудудий жойланиши жиҳатдан Фарғона водийсининг адирлари водийни ўраб олган тоғлардан кейин иккинчи халқани ҳосил қилади. Ҳудуд релъефининг марказий Фарғонага нисбатан баландлашуви туфайли ёғин миқдори ортади, ёзги ҳарорат чўлга нисбатан пастроқ бўлиб, типик ва тўқ бўз тупроқлар тарқалган. Булар эса ўсимликларни зич ва баланд ўсишига сабаб бўлади [12].

Адирлар ва паст тоғлар оралиғида фақатгина водий учунгина хос бўлган **адир орти ва адир оралиғи ботиқлари** ландшафти жойлашган. Вилоятда бу ҳудудларга Ойим-Хўжаобод-Марҳамат ботиғини киритиш мумкин. Реълефнинг қулайлиги адир олди текисликларига ўхшаб кетади. Бироқ, ер ости сувларининг кетмаслиги, дренаж ҳолатининг ёмонлиги бу ҳудудлар учун муаммоларни келтириб чиқаради..

Паст тоғлар минтақаси бевосита тоғ олди текисликлари ва адир оралиғи ботиқларига уланиб кетади. Бу зона Фарғона водийсининг Туркистон, Олой, Фарғона тизмаларининг этакларини ташкил этиб, унча катта бўлмаган кенгликларда жойлашган. Айниқса, водийнинг жанубий қисмидаги тоғ олди зонаси 30-40 км ни ташкил этади. Шимолий ва шимоли-шарқий ҳудудларда эса 30-50 км гача масофаларни эгаллайди. Ҳудуд рельефида кучли парчаланганлик, ёнбағир емирилиш жараёнларининг фаоллиги, уларнинг этакларида эса емирилган йирик ва дағал жинсларнинг тартибсиз жойлашганлиги кузатилади.

Адирларни хўжалик нуқтаи-назаридан баҳолаб, К.Боймирзаев уларни 2 турга бўлиб ўрганишни тавсия қилади. Биринчи тур паст адирлар (500-800 м), иккиннчи тур юқори адирлар (900-1200 м гача) минтқасига ажратади [8; 8-б.]Паст адирлар релъефи текис қирлардан иборат бўлиб хўжаликда фойдаланиш учун қулайдир. Бу минтақадаги релъефнинг парчаланганлиги ва қиялиги хўжаликнинг жойланишигига салбий тасир этувчи омилдир.

Табиий-ландшафт кўрсаткичларини, иқтисодий - географик нуқтаи - назардан ҳисоблашлар имконияти мавжудлигини эътиборга олган ҳолида Андижон вилояти Тоғ олди ва адир ҳудудлари 6 та ландшафт минтақаларига ажратилди. (**1-расм)**



Карта А.Никонорова ва "Ўздеверлойиха" институти Андижон комплекс-лойихалаш филяли томонидан тузилган Андижон вилояти тупроқ-географик раёнлар схематик картаси маълумотлари асосида муаллиф томонидан ArcGIS дастурида ишлаб чиқилган.

Албатта иқтисодий географиянинг кўплаб амалий ишларида фойдаланиладиган маъмурий бирликларни ландшафт бирликлари билан умумлаштириш бир қатор муаммоларни юзага келтирсада, ундан амалий жиҳатдан фойдаланиш бугунги бозор иқтисодиёти шароитида катта амалий ечимларга олиб келади.

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ВЛИЯНИЕ ИЗУЧАЕМЫХ ДЕФОЛИАНТОВ НА ХИМИЧЕСКИЙ СОСТАВ СЕМЯН ХЛОПЧАТНИКА

Аннотация: *В данной статье, по результатам научных исследований, в 1-м опыте, проведенном в течение многих лет, у сортов хлопчатника С-6775 и С-8290 Энто-Дефол был равен 0,100; Среди норм 0,150 и 0,200 л/га относительно высокие показатели были получены под влиянием его нормы 0,150 л/га, выход ядра составил 56,3%, общий азот - 1,78%, белок - 0,60% и белок - 1,10%. Эти показатели в свою очередь превышали контроль соответственно на 0,8%, 0,17; 0,5 и 0,12% по сравнению с оптимальной нормой (0,200 л/га) в 1-м сроке - 0,2%; 0,11; 0,1 и 0,10% соответственно. Таким образом, при применении дефолиантов при раскрытии коробочек на 50-60% синтез белкового азота в семенах увеличивается, в результате увеличивается его количество, при раскрытии 30-40% наблюдается относительно хорошая спелость семян, наблюдается относительно низкий синтез белка под влиянием дефолианта.*

Ключевые слова: *хлопчатник, семена, вес семян, химический состав, варианты, общая площадь поля, химические вещества, результаты.*

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INFLUENCE OF THE STUDIED DEFOLIANTS ON THE CHEMICAL COMPOSITION OF COTTON SEEDS

Abstract: *In this article, based on the results of scientific research, in the 1st experiment conducted over many years, it was found that in the C-6775 and C-8290 cotton varieties, Ento-Defol was equal to 0.100; Among the 0.150 and 0.200 l/ha rates, relatively high indicators were obtained under the influence of its 0.150 l/ha rate, with a kernel yield of 56.3%, total nitrogen of 1.78%, protein of 0.60%, and protein of 1.10%. These indicators, in turn, exceeded the control by 0.8%, 0.17; 0.5 and 0.12% compared to the optimal rate (0.200 l/ha) in the 1st stage - 0.2%; 0.11; 0.1 and 0.10%, respectively. Thus, when defoliants are used at 50-60% boll opening, protein nitrogen synthesis in the seeds increases, resulting in an increase in its quantity, at 30-40% boll opening, relatively good seed maturity is observed, and relatively low protein synthesis is observed under the influence of the defoliant.*

Keywords: *cotton, seeds, seed weight, chemical composition, variants, total field area, chemical substances, results.*

I. Введение

Для проведения качественной дефолиации на любых возделываемых растениях хлопчатника, прежде всего, важное значение имеет количество растений на площади посева хлопчатника и степень их густоты. Также одной из актуальных задач на сегодняшний день является изучение влияния применяемого дефолианта не только на урожайность хлопка, но и на химический состав семян в составе хлопка-сырца.

Причина в том, что значительное улучшение качественных показателей хлопкового волокна под влиянием применяемых дефолиантов научно доказано многими учеными отрасли, и здесь следует отметить, что если получить качественное волокно и получить качественные семена, то намеченная цель будет полностью достигнута. Ведь если показатели качества и химического состава семян положительны, доля продуктов, получаемых в процессе переработки, также даст хорошие результаты.

II. Обзор литературы

По результатам своего исследования Ш.Тешаев пришел к следующему выводу. В результате дефолиации в листьях происходит перераспределение питательных веществ. В результате коробочки усваивают достаточное количество питательных веществ, семена полностью формируются и обеспечивают увеличение количества ядра в семенах (Ш. Тешаев и др.,).

По мнению М.Мухаммаджонова и А.Зокирова, температура воздуха играет важную роль в проведении дефолиации. Температура в пределах 18-21^{0}C считается умеренной. При суточной температуре 14-15^{0}C снижается опадение листьев, а при температуре выше 21^{0}C норму дефолианта необходимо снизить на 10% (М.Мухаммаджонов и др.,).

Следуя рекомендациям по качественному проведению дефолиации хлопчатника, при проведении дефолиации хлопчатника и начале уборки через 12-15 дней достигнуто раскрытие 85-90% коробочек, в результате чего основная часть урожая реализуется первым сортам (Ш. Тешабаев и др.,).

III. Методология

Исходя из вышеуказанных актуальных задач, в 2018-2022 годах наши исследования по теме проводились в условиях лугово-сазовых, тяжелосуглинистых по механическому составу, слабозасоленных почв научно-опытной станции Научно-исследовательского института селекции, семеноводства и агротехнологии выращивания хлопка, расположенного в Кувинском районе Ферганской области, с глубиной залегания грунтовых вод 1,6-1,8 метра (Убайдуллаев и др., 2024).

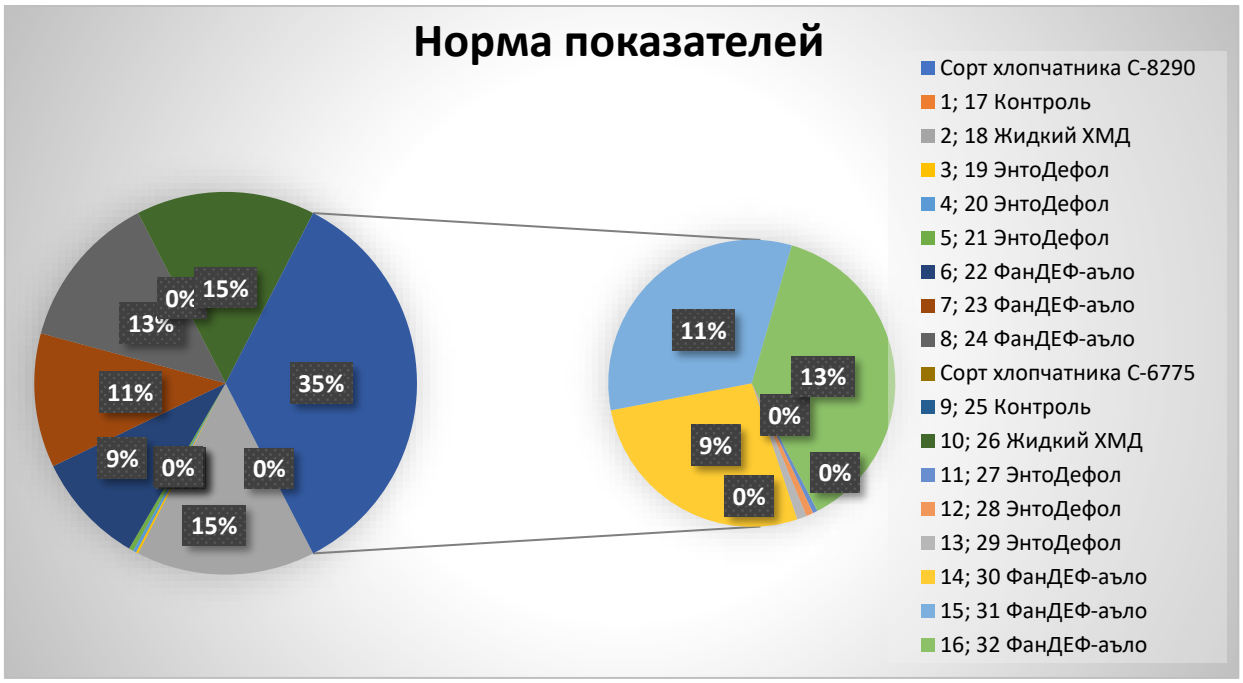
Научные исследования проводились на основе пособий “Методика полевых опытов с хлопчатником”, “Методические указания по испытанию дефолиантов”, “Методы определения свойств хлопкового волокна” и “Методы проведения полевых опытов”, принятых в УзНИИХ, а также полученные данные были проанализированы математически и статистически на основе программы Microsoft Excel по методу Б.А.Доспехова “Методика полевого опыта”.

IV. Анализ и результаты

В 1-м опыте, проведенном в 2018-2022 годах, данные по эффективности влияния дефолиантов на химический состав семян хлопчатника сортов С-6775 и С-8290 представлены на диаграмме 1, в контрольном варианте (1) хлопчатника сорта С-8290 при раскрытии 30-40% коробочек выход ядра семян составил 55,4%, общий азот - 1,52%, белок - 0,64%, а азот, входящий в состав белка (далее - "белок"), составил 0,88%.

Следует отметить, что это количество составляет 57,8% от общего количества белкового азота. Следовательно, и в контроле в результате естественного синтеза эта часть общего азота вошла в состав белка. Теперь, если мы посмотрим, как протекает процесс при использовании Жидкого ХМД в норме 8,0 л/га, то в этом случае 1,51% общего азота входит в состав белкового азота на 0,89%, что составляет 58,9% от общего белкового азота. Таким образом, большая часть азота, входящего в состав растения, превратилась в органическое вещество, но еще 41,1% осталось в растении в минеральном состоянии.

Наша цель - максимально увеличить количество белкового азота, что требует оптимального применения всех агротехнических мероприятий.



1-диаграмма. Влияние дефолиантов на химические показатели качества семян, 2020 г., опыт No1

Энто-Дефола 0,100; относительно оптимальные показатели между нормами 0,150 и 0,200 л/га были получены относительно выше нормы 0,200 л/га, выход ядра составил 56,1%, общий азот - 1,67%, белок - 0,67% и содержание белка - 1,60, что составило 0,7%; 0,15; 0,3 и 0,12% соответственно. Кроме того, под влиянием жидкого ХМД-8,0 л/га - 1,1%; 0,16; 0,05 и 0,11% соответственно. В этом варианте 59,8% общего азота уже вошло в состав белка, что на 2,0% выше, чем в контроле.

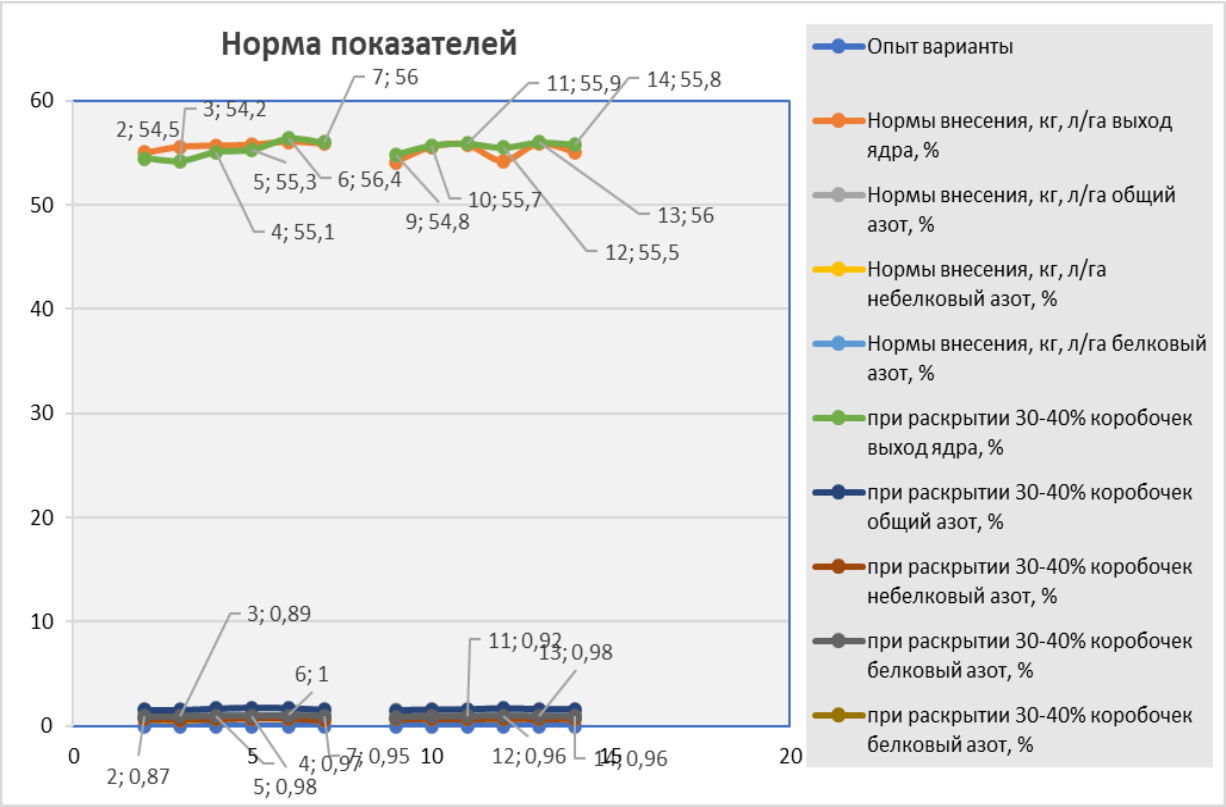
Следовательно, наблюдается ускорение синтеза белка под влиянием дефолиантов.

В контрольных вариантах (17-24) с раскрытием коробочек 50-60% выход ядра семян составил 55,5%, общего азота - 1,51%, белок - 0,63% и белок - 0,88%, что на 0,1; 0,1;0,1 и 0,0% соответственно.

В проведенных исследованиях (2018-2020) во 2-м опыте в условиях 2020 года при раскрытии 30-40% коробочек хлопчатника сорта С-8290 выход ядра по сравнению с контролем (1-6 вар) составил 55,0%, общий азот - 1,50%, белок - 0,63% и белок - 0,87%, а показатели параллельного варианта в 1-м опыте соответственно составили 0,4; 0,02; 0,01 и 0,01% или были почти равны. При использовании в качестве эталона Супер жидкий ХМД-8,0 л/га эти показатели составили 35,6; 1,40; 0,51 и 0,89%, что на 0,6; 0,10; 0,12 и 0,02 соответствен.

При применении в качестве эталона Хим-экстра нормой 0,200 л/га выход ядра составил 55,2; общий азот 1,64; безбелковый азот 0,67 и белок 0,97% по сравнению с контролем 0,2; 0,14; При применении Хим-экстра в норме 0,150 л/га+Этифон 1,0 л/га выход ядра составил 56,1%; общий азот -

1,68; белок - 0,68 и белок - 1,00%, что на 1,1%, 0,18; 0,05; и 0,15%, а эталонного Хим-экстра - 0,200 л/га на 0,4; 0,4; 0,1 и 0,02% соответственно. При раскрытии 50-60% коробочек этого сорта (С-8290) в контрольных вариантах (13-18) выход ядра составил 54,5; общий азот - 1,52; белок - 0,63 и белок - 0,88%, что составило 0,5%, 0,02; 0,0 и 0,10% соответственно.



2-диаграмма. Влияние дефолиантов на химические показатели качества семян, 2020 г., опыт No2

При применении супержидкого ХМД нормой 8,0 л/га эти показатели соответственно составили 54,2; 1,50; 0,61 и 0,89%, а содержание белкового азота увеличилось на 0,01% соответственно. При использовании в качестве эталона Хим-экстранормой 0,200 л/га выход ядра составил 55,1; общий азот - 1,60; белок - 0,64 и содержание белка - 0,96%, наблюдалось увеличение содержания белкового азота на 0,10% от контроля и на 0,09% от воздействия Супер жидкий ХМД-8,0 л/га.

В этот период раскрытия коробочек (2) были получены относительно высокие данные от норм Хим-экстра 0,100 л/га+Этифон 1,5 л/га, выход ядра составил 56,4; общий азот 1,68; белок 0,70 и белок 0,98%, от эталонного Хим-экстра 0,200 л/га соответственно 1,3%, 0,06; 0,08 и 0,02 5 соответственно. У сорта хлопчатника Наманган-77 при раскрытии коробочек 30-40, 50-60% в контрольном варианте (7) выход ядра семян составил 54,1; общий азот - 1,53; белок - 0,68 и белок - 0,85%, при этом 55,5% от общего (1,53%) азота вошло в

состав белка, в то время как у сорта С-8290 в тот же период (1-й вариант) этот показатель составил 58,0%.

V. Выводы и предложения

Следовательно, относительно высокие показатели были получены при применении Хим-экстранормой 0,100 л/га + Этифон 1,5 л/га, выход ядра составил 56,0%, общий азот - 1,69%, белок - 0,75 и белок - 0,94%, что соответственно составило 1,2%, 0,21; 0,9 и 0,08% соответственно. Если сравнить показатель этого варианта с оптимальным вариантом в 1-м периоде, то общий белковый азот на самом деле составил 57,8 и 58,6%.

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О ВЕРОЯТНОСТИ СЛОЖНЫХ СОБЫТИЙ И ЕЁ НЕКОТОРЫЕ ПРИМЕНЕНИЯ

Аннотация: *на практике часто наблюдается так называемые сложные события, исследуемые методами теории вероятностей. В этой статье изучено вероятность сложных событий и её некоторые применения для решения ряда задач.*

Ключевые слова: *Сложное событие, испытание, опыть, вероятность, условная вероятность, формула умножения, формула сложения, метод.*

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ON THE PROBABILITY OF COMPLEX EVENTS AND SOME OF ITS APPLICATIONS

Annotation. *In practice, so-called complex events are often observed, investigated by methods of probability theory. This article examines the probability of complex events and some of its applications for solving a number of problems.*

Keywords: *Complex event, test, experiment, probability, conditional probability, multiplication formula, addition formula, method.*

Известно, что теория вероятностей изучает модели экспериментов со случайными исходами (случайных экспериментов) и всякий случайный эксперимент (испытания, опыт) состоит в осуществлении некоторого вполне определенного комплекса условий и наблюдении результата. А любой наблюдаемый результат интерпретируется как случайный исход опыта, которого называем случайным событием [1-2]. Заметим, что событие может произойти, а может и не произойти в результате опыта. На практике часто наблюдается сложные события и задачи для нахождения вероятностей наступления таких событий.

Сложным событием называется наблюдаемое событие, выраженное через другие наблюдаемые в том же эксперименте события с помощью допустимых алгебраических операций. Вероятность осуществления того или иного сложного события вычисляется с помощью формулы умножения, т.е. если оба события A и B обладают ненулевой вероятностью то формула умножения может быть записана двояким образом в виде

$$P(AB) = P(A) \cdot P(B/A) = P(B) \cdot P(A/B) \qquad (1)$$

и формулы сложения, которая в случае двух произвольных наблюдаемых событий A и B записывается в виде

$$P(A+B)=P(A)+P(B)-P(AB) \qquad (2)$$

(в частном случае, когда $A\cdot B=\varnothing$, то

$P(A+B)=P(A)+P(B)$ (аксиома сложения)).

Отметим, что формула (1) позволяет вычислить вероятность совместного осуществления событий A и B в тех случаях, когда условные вероятности

$P(B/A)$ и $P(A/B)$ считается известной из дополнительных опытов или определяется методом вспомогательного эксперимента.

Формула умножения для произвольного числа событий записывается следующим образом:

$$P(A_1\cdot A_2\cdot A_3\cdot\ldots\cdot A_n)=P(A_1)\cdot P(A_2/A_1)\cdot P(A_3/A_1A_2)\cdot\ldots\cdot P(A_n/A_1A_2\ldots\ldots A_{n-1}) \qquad (3)$$

Формула (3) справедлива, если все входящие в правую часть условные вероятности [3-4] определены.

Также для n слагаемых формула (2) обобщается следующим образом:

$$P\left(\sum_{k=1}^{n}A_k\right)=\sum_{k=1}^{n}P(A_k)-\sum_{i}\sum_{j}P(A_iA_j)+\sum_{i}\sum_{j}\sum_{k}P(A_iA_jA_k)+\ldots.+(-1)^{n-1}P(A_1A_2A_3\ldots A_n). \qquad (4)$$

$$i<j \qquad\qquad i<j<k$$

В частности, для вероятности осуществления хотя бы одного из трех событий, A , B и C получаем формулу

$$P(A+B+C)=P(A)+P(B)+P(C)-P(AB)-P(AC)-P(BC)+P(ABC) \qquad (5)$$

Если события $A_1,A_2,A_3,\ldots,A_n$ независимы в совокупности то вероятность осуществления хотя бы одного из них проще вычисляется не по формуле сложения (4), а с помощью формулы умножения:

$$P(A_1+A_2+\ldots+A_n)=1-P\left(\overline{A_1+A_2+\ldots+A_n}\right)=1-P\left(\overline{A_1}\right)\cdot P\left(\overline{A_2}\right)\cdot\ldots\cdot P\left(\overline{A_n}\right) \qquad (6)$$

Теперь рассмотрим некоторые задачи вычисления вероятностей сложных событий.

Задача 1. В продукции завода брак составляет 5% от общего количества выпускаемых деталей. Для контроля отобрано 20 деталей. Какова вероятность того, что среди них имеется хотя бы одна бракованная?

Решение: Для любой детали из продукции завода вероятность быть бракованным равно по условию $p=0.05=P(A_k),\ k=1,2,\ldots.,20.$, где событие

$A_k=$ (k-я по счету извлечённая деталь бракованная). Очевидно, нас интересует событие $A_1+A_2+\ldots+A_{20}$. В условиях отлаженного технологического процесса можно считать, что события $A_1+A_2+\ldots+A_{20}$ независимы в совокупности. Тогда по формуле (6) получаем

$$P(A_1+A_2+\ldots+A_{20})=1-\prod_{k=1}^{20}P\left(\overline{A_k}\right)=1-0.95^{20}\approx 0.64$$

Задача 2. Из 100 студентов, находящихся в аудатории, 50 человек знают английский язык, 40- французский и 35- немецкий. Английский и французский языки знают 20 студентов, английский и немецкий -8, французский и немецкий -10. Все три языка знают 5 человек. Один из студентов вышел из аудатории. Вычислить вероятности следующих событий: А-(вышедший знает или английский или французский язык); B - (вышедший знает только английский язык); C - (вышедший не знает ни одного языка).

Решение. Рассмотрим следующие события: E -(вышедший знает английский язык), D - (вышедший знает французский язык), D - (вышедший знает немецкий язык).

Тогда для $A = E + F$, то используя формулу (2) получим

$$P(A) = P(E) + P(F) - P(EF) = \frac{50}{100} + \frac{40}{100} - \frac{50}{100} \cdot \frac{40}{100} = 0,5 + 0,4 - 0,2 = 0,7 .$$

Событие B можно представить в виде $\mathrm{B} = \mathrm{E}\bar{\mathrm{D}}\bar{\mathrm{F}}$. Тогда используя формулу умножения (1), свойства условной вероятности и формулу сложения (2) получим:

$$P(B) = P\left(E\bar{D}\bar{F}\right) = P(E) \cdot P(\bar{D}\bar{F} / E) = P(E) \cdot \left(1 - P\left(D + F / E\right)\right) =$$

$$= P(E) - P(E) \cdot P\left(D + F / E\right)) = P(E) - P\left(DE + FE\right) =$$

$$= P(E) - (P(DE) + P(EF) + P(DEF)) = 0,5 - 0,08 + 0,2 + 0,05 = 0,27$$

Для вычисления вероятности события $C = \bar{E}\bar{D}\bar{F}$ используем правилу де Моргана [5] и формулу сложения (5) для трех событий

$$P(C) = P\left(\bar{E}\bar{D}\bar{F}\right) = P\left(\overline{E + D + F}\right) = 1 - P\left(E + D + F\right) =$$

$$= 1 - (P(E) + + P(D) + P(F) - P(ED) - P(EF) - P(DF) + P(EDF)) = 0,08$$

Задача 3. Вероятность хотя бы одного попадания стрелком в мишень при трех выстрелах равна 0,875. Найти вероятность попадания при одном выстреле.

Решение: Вероятность попадания в мишень хотя бы при одном из трех выстрелов (событие A) равна $P(A) = 1 - q^3$, где q-вероятность промаха.

По условию $P(A) = 0,875$. Следовательно, $0,875 = 1 - q^3$ или

$q^3 = 1 - 0,875 = 0,125$. Отсюда $q = \sqrt[3]{0,125} = 0,5$.

Искомая вероятность $p = 1 - q = 1 - 0,5 = 0,5.$

Задача 4. Радиолокационная станция ведет наблюдение за k объектами. За время наблюдения i – й объект может быть потерян с вероятностью $p_i (i = 1,2,...,k)$ Найти вероятности следующих событий:

A – ни один объект не будет потерян;

B – будет потеряно не менее одного объекта;

C – будет потеряно не более одного объекта.

Решение. $P(A) = \prod_{i=1}^{k} (1 - p_i)$; $P(B) = 1 - \prod_{i=1}^{k} (1 - p_i)$;

$$P(C)=\prod_{i=1}^{k}(1-p_i)+p_1(1-p_2)....(1-p_k)+(1-p_1)p_2(1-p_3)....(1-p_k)+....$$

$$...+(1-p_1)(1-p_2)....(1-p_{k-1})p_k.$$

Последнюю вероятность можно записать в виде

$$P(C)=\prod_{i=1}^{k}(1-p_i)+\sum_{i=1}^{k}\frac{p_i}{1-p_i}\prod_{i=1}^{k}(1-p_i).$$

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УДК 8

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ИНФОРМАЦИОННО-КОММУНИКАТИВНЫЕ ТЕХНОЛОГИИ КАК ОБЯЗАТЕЛЬНЫЙ КОМПОНЕНТ ВСЕГО УЧЕБНО-МЕТОДИЧЕСКОГО КОМПЛЕКСА

Аннотация: *в статье рассматривается вопрос эффективного и правильного использования информационных технологий при изучении русского языка студентами-нефилологами. Автор уделяет внимание актуальным проблемам современного образования с методам активизации учебно-познавательной деятельности обучаемых с новыми подходами при изучении преподаваемого материала. Поднимаются вопросы и основные задачи развития мотивации студентов к изучению предметов вузовской программы.*

Ключевые слова: *стратегии обучения, аудитивно-вербальная, визуально-вербальная, анимация, звук, интерактивность, мотивация.*

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INFORMATION AND COMMUNICATIVE TECHNOLOGIES AS A MANDATORY COMPONENT OF THE WHOLE EDUCATIONAL AND METHODICAL COMPLEX

Abstract: *In the article is considered the question the efficiency using of information technology. It is shown the aspects of activization learning Russian language by students of nonfilology. The author focuses on the current issues of modern education, emphasizing methods to activate the cognitive learning activities of students with new approaches to studying the material being taught. The article raises questions and key tasks related to developing students' motivation for studying the subjects of the university curriculum.*

Keywords: *Learning strategies, auditory-verbal, visual-verbal, animation, sound, interactivity, motivation.*

Не секрет, что общение наряду с передачей информации через информационно-коммуникативную технику становится основным компонентом обучения. По мере введения новых информационных технологий в образование и под влиянием массовой коммуникации

происходит качественный сдвиг в сознании людей, в их поведении. Содержание названных новых технологических средств, на мой взгляд, должно затрагивать умы и чувства обучающихся, заинтересовать и вызывать эмоциональный отклик среди студентов. Поэтому их наличие – обязательный компонент всего учебно-методического комплекса. Кроме того, развитие информационных и коммуникативных технологий заставляет менять традиционные подходы к системе планирования процесса обучения, что особенно видно при проектировании педагогических технологий. Постановка проблемы применения информационно-коммуникативных технологий в процессе изучения русского языка диктует её актуальность. Осуждение этого вопроса весьма злободневно для республики, в том числе и технического универитета. В работе с информационно-коммуникативными технологиями в процессе обучения русскому языку на неязыковых факультетах важна ориентация на коммуникативность, которая, как я считаю, задает динамику учебно-познавательной деятельности студентов. К числу самых важных факторов на данном этапе следует отнести недостаточный учет реальных потребностей обучающихся, учет достижений современных информационных технологий, неразработанность специальных программ и коммуникативной стратегии обучения с техническими средствами и технологии их введения в учебный процесс, учет личностно-ориентированных методик при использовании информационно-коммуникативных технологий в обучении.

В этом плане, на мой взгляд, и в дальнейшем, необходимо сотрудничество представителей смежных дисциплин – программистов, операторов, методистов, лингвистов, психологов, социологов. Таким образом, компьютеризация, индивидуализация и создание практических курсов (практикумов) по русскому языку требуют разработки новой модели обучения и преподавания, и, соответственно, нового подхода и педагогического сознания. Информационно-коммуникативные технологии наряду с созданием благоприятной почвы для обучения русскому языку студентов-нефилологов, также таят в себе и дополнительные трудности, когда у обучающихся создаются неоправданные представления о том, что можно пойти в Интернет-кафе» и все «скачать». Сейчас представляется общепризнанным положение о том, что эффективность процесса обучения русскому языку как иностранному на основе информационно-коммуникативных технологий существенно зависит от степени и правильности их использования. При этом, однако, следует учитывать и то, что в зависимости от результатов их воздействия на студента они могут быть как положительными, так и отрицательными. Особую актуальность это положение имеет в применении современных информационных технологий к обучению студентов нефилологического направления. Учитывая специфические особенности названных технологий, следует не только умело использовать, но и целенаправленно активизировать работу с каждым новым элементом изучаемого языка в тесной связи с таким новым средством обучения как информационно-коммуникативные машины.

В работе с ними на фоне общего объема преподавания курса русского

языка для студентов-нефилологов, по моему мнению, можно выделить то специфическое, что должно быть представлено в частных программах, т.е. в учебных, рабочих программах преподавателей, учитывающих конкретные профессиональные интересы обучающихся, а также подъязык их специальности.

Перспективы разработки проблематики реализуются и в формальном, и функциональном подходе. Важным также представляется вопрос предъявления заданий и упражнений, выполняемых посредством информационно-коммуникативных технологий, а также требования по их выполнению. Они должны быть представлены в строгой последовательности (связь по содержанию и языку), учитывать их деятельностный потенциал, ориентировать студентов на усвоение как устной, так и письменной речи обучающихся, должны активизировать различные типы памяти (аудитивно-вербальную, визуально-вербальную), а также рассчитанные на чередование индивидуализированных заданий с групповыми. Программные упражнения и задания должны обучать повседневному общению, овладению общением в социокультурной, общественно-политической, экономической сфере, усвоению правил общения в учебно-производственной сфере и «погружению» в профессиональное общение. Вместе с этим необходимо разработать концепцию обучения русскому языку студентов-нефилологов на основе информационно-коммуникативных технологий, а также ускорить оснащение вузов современной техникой (компьютеры, Интернет и т.д.). При этом следует иметь в виду полную автоматизацию деятельности преподавателя, наличие достаточного электронного материала, электронных учебных и информационных технологий. Все это должно быть в комплексе и преследовать определенные цели образовательного процесса. Благодаря виртуальности обучения студент включается в иллюзорный учебный процесс, оказывая влияние на виртуальные объекты, а затем создавая свои. Кроме того обучение с наглядным материалом и обширностью его содержания позволяет интенсифицировать образовательный процесс, так как процессы, представляемые в наглядной форме с анимацией и звуками, воспринимаются легче и быстрее. Интерактивность осуществляется и при помощи дистанционного обучения, где студент самостоятельно усваивает учебные материалы, общается с преподавателем, получает консультацию, обсуждает учебные проблемы и вопросы, проходит тестирование, выполняет задания как исследовательского, так и творческого характера. Как уже известно, дистанционное обучение состоит из Интернет-лекций, видео-конференций и дискуссий, где обучающийся получает ответ на свои вопросы. Эта обратная связь может осуществляться в любое время, удобное для студента, и в течение длительного времени. И электронное обучение, и Web-обучение, и онлайновое обучение, и дистанционное обучение часто используются как взаимозаменяемые. Чтобы улучшить качество обучения русскому языку, необходимо наличие современной учебно-лабораторной базы, способную

оказать поддержку учебных программ в тесной связи с научными изысканиями, при этом учитывая реалии современного мира.

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ЗАКОНОМЕРНОСТИ СТРАТИФИКАЦИИ ПОВЕРХНОСТНЫХ ВОДОТОКОВ СОВРЕМЕННОЙ ДЕЛЬТЫ АМУДАРЬИ

Аннотация. *В статье выявлены общие географические структуры стоков в мелких дельтах и бассейнах коллеторов. "Древовидная" структура и "бассейновая" структура стоков связаны с внутренней структурой объектов и структура рельефа играет в этой связи ключевую роль. Кроме того, научно обосновано значение двух групп структуры стоков в определении геохимического режима ландшафтов.*
Ключевые слова: *бассейн, водосбор, поверхностный сток воды, ландшафт, геохимический режим, связность.*

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REGULARITIES OF STRATIFICATION OF SURFACE WATERCOURSES OF THE MODERN AMUDARYA DELTA

Abstract. *The article reveals the general geographic patterns of runoff in small deltas and collector basins. The "treelike" structure and the "basin" structure of runoff are related to the internal structure of objects, and the relief structure plays a key role in this connection. In addition, the importance of two groups of runoff structure in determining the geochemical regime of landscapes has been scientifically substantiated.*
Key words: *basin, catchment, surface water flow, landscape, geochemical regime, connectivity.*

Направление и методы исследования. Впервые на пластическа рельефа карте современной дельты Амударьи с помощью «Прямых линий» показаны элементы рельефа земной поверхности путем картографической идеализации рельефной структуры. При этом на основе «Взаимозависимого» анализа изучается связь направления поверхностных стоков со структурой рельефа.

Результаты и обсуждение. Направление поверхностных стоков в девяти мелких дельтах и шести коллекторных бассейнах, выделенных на основе пластически рельефа карты современной дельты Амударьи, в свою очередь связано с элементами рельефа (возвышениями и понижениями), формирующими внутреннюю структуру объектов.

С.Д.Муравейский (1948) первым теоретически обосновал роль поверхностных стоков в формировании ландшафтов. Образующиеся в процессе развития дельты малые дельты имеют «древовидную» структуру, которая в настоящее время определяет структуру поверхностных стоков на неорошаемых территориях. На орошаемых территориях имеются коллекторные бассейны, и структура поверхностных стоков в них своеобразна. Поверхностные стоки на орошаемых и неорошаемых территориях современной дельты Амударьи резко отличаются друг от друга по своей структуре. Поэтому мы разделили их на две группы: 1. Древовидная структура (рис. 1); 2. Бассейновая структура (рис. 2).

Как видно из рисунков, высотный элемент рельефа играет основную роль в определении направления поверхностных потоков воды. Поэтому крупномасштабные (М 1:25 000) рельефные пластиковые карты являются основным источником для изучения структуры поверхностных потоков воды в дельте. «Древесная» и «бассейновая» структуры поверхностных потоков воды являются ключевым фактором в изучении геохимического режима ландшафтов.

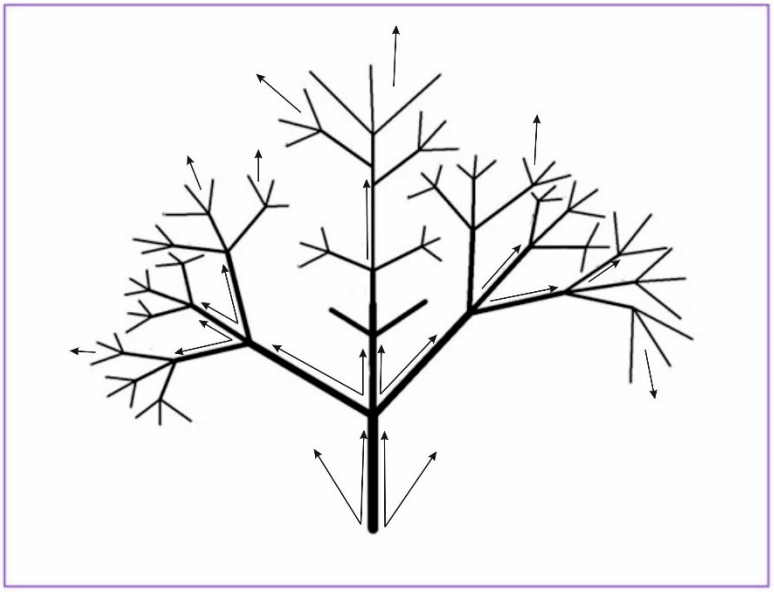

Рисунок 1. «Древовидная» структура поверхностных потоков воды в идеализированной мелкой дельты

Условные обозначения:

- элементы рельефа;

- направление потока поверхностных вод

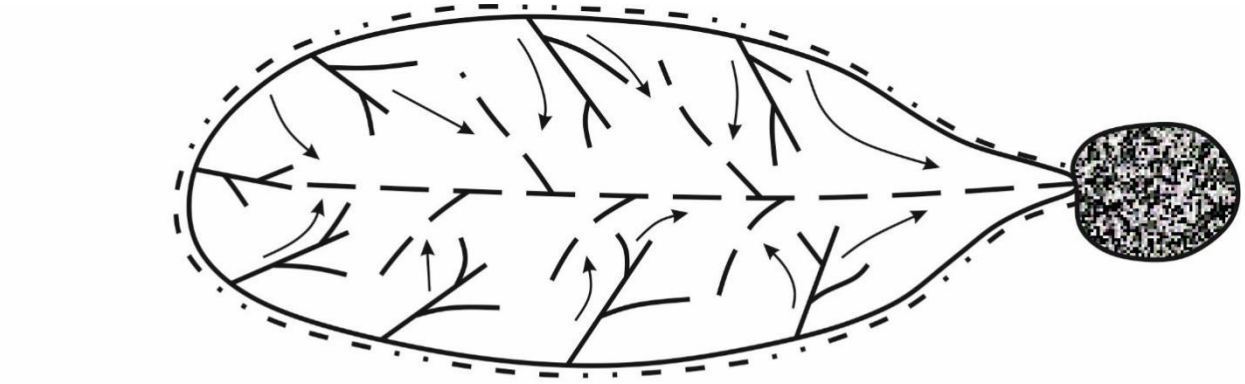

Рисунок 2. «Бассейновая» структура поверхностных потоков воды в идеализированном коллектора сброса

Условные обозначения:

- граница бассейна;

- элементы рельефа;

- поверхностный сток воды;

- коллектор;

- озера;

Поэтому теоретическое значение исследования «древовидной» и «бассейновой» структур поверхностных потоков воды заключается в следующем:

1. «Древовидная» структура поверхностных стоков в каждой малой дельте связана с элементами рельефа (повышениями и понижениями), а поверхностный сток является основным фактором изменения мелиоративных условий в зависимости от площади повышений и понижений;

2. Так же, как глубина залегания грунтовых вод играет роль в формировании ландшафтов с различным водно-солевым режимом (гидроморфный, полугидроморфный, автоморфный), поверхностный сток также играет роль в динамике и миграции солей в ландшафтах;

3. «Бассейновая» структура поверхностного стока в коллекторном бассейне в первую очередь зависит от элементов геохимического ландшафта объекта, которые в основном перемещаются от элювиального элементарного ландшафта к супераквальному элементарному ландшафту, т. е. геохимический режим ландшафтов закономерно изменяется в этом направлении;

4. Структура поверхностных водотоков зависит, с одной стороны, от структурной целостности малых дельт, а с другой стороны, от функциональной целостности коллекторных бассейнов;

5. Применение бассейновой концепции в рациональном использовании природных ресурсов речных и коллекторных бассейнов, в свою очередь, требует теоретических знаний о структуре поверхностных водотоков, то есть направление поверхностных водотоков напрямую влияет на компоненты природы в бассейнах и их качественные показатели.

Заключение. 1. Малые дельты, образованные в результате деятельности поверхностных водотоков в условиях дельты, в настоящее время формируют «древовидную» структуру поверхностных водотоков объектов; 2. Поверхностные водотоки, обусловливающие взаимосвязь малых дельт в коллекторных бассейнах, определяют «бассейновую» структуру; 3. Поскольку поверхностный водоток в малых дельтах движется от высот русла реки к надводному элементарному ландшафту с обеих сторон, то мелиоративное состояние и механический состав почв, химический уровень грунтовых вод и геохимический режим ландшафтов систематически изменяются в одном направлении; 4. В коллекторных бассейнах поверхностный водоток движется от границы бассейна к коллекторному бассейну, а качество природных компонентов изменяется в одном направлении; 5. «Древовидная» структура поверхностных потоков воды на неорошаемых территориях современной дельты Амударьи и «бассейновая» структура на орошаемых территориях являются общей географической структурой, характерной для всех дельтовых геосистем Центральной Азии; 6. Главным фактором формирования этих двух структур поверхностных потоков воды, существующих в условиях дельты, является пластичность рельефа. Поскольку структура поверхностных потоков воды всегда требует взаимосвязи между рельефом и потоками воды, то на их структуру непосредственное влияние оказывает форма рельефа.

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ОРГАНОЛЕПТИЧЕСКИЕ ПОКАЗАТЕЛИ ОТРУБЕЙ НЕКОТОРЫХ ЗЛАКОВЫХ РАСТЕНИЙ НАШЕЙ СТРАНЫ

Аннотация. *Биологически активные вещества и органолептические показатели химического состава отрубей зависят от таких факторов, как климат и питательная насыщенность зерновых культур, выращиваемых в нашей стране. В статье проведен анализ органолептических показателей отрубей злаковых растений, выращенных в нашей стране, и доказано, что они соответствуют требованиям Государственной фармакопеи.*

Ключевые слова. *Пшеница, кукуруза, ячмень, отруби, органолептические показатели, зола, влажность.*

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ORGANOLEPTIC INDICATORS OF BRAN OF SOME CEREALS OF OUR COUNTRY

Abstract. *Biologically active substances and organoleptic indicators of the chemical composition of bran depend on such factors as climate and nutritional saturation of grain crops grown in our country. The article analyzes the organoleptic indicators of bran of cereal plants grown in our country and proves that they meet the requirements of the State Pharmacopoeia.*

Key words: *Wheat, corn, barley, bran, organoleptic properties, ash, moisture.*

Цельное зерно состоит из шелухи, эндосперма и ядра. Отруби являются важным компонентом цельного зерна, составляя 12–25% от общего объема зерна.

Часть зерна, богатая органическими и неорганическими компонентами, больше сконцентрирована в отрубях, чем в ядре, что свидетельствует о том, что польза для здоровья цельного зерна выше, чем у эндосперма и ядра. [1]

Компоненты, хранящиеся в отрубях злаковых растений, и их пищевая ценность были изучены Роузом и соавторами. Р.В. Кирби доказал, что кукурузные отруби могут улучшить гиперхолестеринемию, которая наблюдается в результате концентрации общего холестерина в плазме крови, превышающей 5 ммоль/литр, за счет снижения уровня холестерина

липопротеинов низкой плотности. Изученные данные приведены в таблице 1. [2, 3].

1-таблица
Содержание золы, белка, жира и влаги в пшеничных, кукурузных и ячменных отрубях на 100 г продукта

Показатели	Отруби злаковых		
	Пшеница	Кукуруза	Ячмень
Калория	225 ккал	165 ккал	288 ккал
Белки	16 г	10.3 г	10.3 г
Жиры	3.8 г	4.9 г	2.4 г
Углеводы	16.6 г	60 г	56.4 г
Волокна	43.6 г	9.6 г	14.5 г
Зола	5 г	1.2 г	14 г
Влажность	11.4 %	12.2 %	10.6 %

Отруби содержат Омега-3 (расщепляют триглицериды в организме человека) и Омега-6 (контролируют уровень холестерина, активизируют рост ногтей, волос и роста) — полиненасыщенные жирные кислоты, которые не вырабатываются организмом человека. Они способствуют нормализации работы сердца, активизируют работу мозга, уменьшают атеросклероз, очищают кровеносные сосуды и кишечник. [4,5]

Пшеничные отруби вызывают чувство сытости за счет увеличения количества отрубяных клеток в желудке. Эта функция особенно важна для тех, кто хочет похудеть. Кроме того, он помогает выводить из кишечника все ненужное — токсины, слизь — и снижает риск запоров и рака толстой кишки. Вот почему многие диетологи рекомендуют пшеничные отруби при запорах.[6]

С целью обоснования возможности использования отрубянистой части мягкой пшеницы, кукурузы и озимого ячменя, выращенных в нашей стране, в качестве эффективного средства при воспалительных заболеваниях были проведены химические анализы их органолептических показателей в соответствии с требованиями государственной фармакопеи.

Цвет, вкус, влажность и зольность пшеничных, кукурузных и ячменных отрубей представлены в таблице 2.

2-таблица
Качественные и количественные органолептические показатели пшеничных, кукурузных, ячменных отрубей

Показатели	**Пшеница**	Кукуруза	Ячмень
Состав	Отруби		
Цвет	Светло-каричневый	Желтый	Светло-желтый
Вкус	Со сладким привкусом	Средней сладости	Средней сладости
Влажность, %	8.5	9.5	7.2
Золность, %	4.77	3.8	4.2

Определено, что влажность пшеничных отрубей, выращенных в нашей стране, составляет 8,5%, зольность – 6,77%, те же показатели у кукурузных отрубей – 9,5%, 1,8%, у ячменных отрубей – 7,2%, 2,84%, а pH – 4,5 соответственно. Установлено, что все образцы пшеничных, кукурузных и ячменных отрубей имели влажность не более 9,6% и зольность не более 4,9%, что соответствует требованиям Агентства по пищевым стандартам.

Вывод. Сделан вывод о возможности разработки пищевых добавок, лечащих воспаление, в частности, устраняющих воспаление кишечника, на основе анализа химического состава кишечника, содержания макро- и микробиологических элементов, биологической активности на основе пшеничных, кукурузных и ячменных отрубей злаковых образцов нашей страны. [7]

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ЮССХ УСУЛИДА БУҒДОЙ ВА МАККА КЕПАГИ ТАРКИБИДАГИ БИОЛОГИК ФАОЛ МОДДАЛАРНИ АНИҚЛАШ

Аннотация. *Донли ўсимликлар кепагининг кимёвий таркибидаги биологик фаол моддалар қандли диабет, семириш, атеросклероз каби каслликларни даволашда қўлланилиши маълум. Кепак таркибида тутувчи биологик фаол моддалар ҳамда фенол бирикмалар қаторини аниқ тахлиллари натижасида, улардан табиий ва зарарсиз қўшилмалар сифатида қўллашни амалиётга жорий килиш мумкин.*

Калит сўзлар. *Ичак яллиғланиш каслликлари, кепак, буғдой, маккажўхори, фенол бирикмалари, ЮССХ усули, салитсил кислотаси.*

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DETERMINATION OF BIOLOGICALLY ACTIVE SUBSTANCES IN WHEAT AND MECCA BRAN IN THE YUSSCH METHOD

Abstract. *It is known that biologically active substances included in the chemical composition of bran of cereal plants are used in the treatment of such diseases as diabetes, obesity, atherosclerosis. As a result of the precise analysis of the spectrum of biologically active substances and phenolic compounds contained in bran, it became possible to use them as natural and harmless additives.*

Key words. *Inflammatory bowel diseases, bran, wheat, corn, phenolic compounds, HPLC method, salicylic acid.*

Ичак яллиғланиш касалликлари (ИЯК) бутун дунёда ошқозон-ичак касалликларининг қаторида асоратлари ва ўлим даражаси бўйича етакчи ўринлардан бирини эгаллайди. ИЯК патогенези атроф-муҳитнинг таъсири (ичак микрофлораси, озиқ-овқат метаболитлари), ирсий омиллар ва ичакнинг лимфоид тўқималарида иммунитет реакциясининг дисрегуляцияси натижасида ичак қаватларининг тўсиғининг ҳимоя механизмларининг бузилишига асосланади. [1] Ичак касалликлари яллиғланишини даволашда замоновий препаратлар қўлланиладиган дунёнинг илғор мамлакатлари Европа ва Америкада хам касаллик эпидимиологияси 100 минг холатдан мингга яқинни ташкил қилади. [2]

Илмий текширишлар натижасида, ёғон ичак яллиғланиши, хусусан, ёғон ичак колитини даволашда сулфасалазин препарати қўлланилганда

сезиларли ютуқ бўлишига қарамай, сулфасалазинни қабул қилган беморларнинг тахминан 30 фоизи агранулоцитоз билан лейкопения, теридаги токсик-аллергик асоратлар, буйрак функциясининг бузилиши, панкреатит ва шу каби нохуш ҳолатлар қайд этилган [3]. ИЯК даволашда қўлланиладиган Замонавий препаратларнинг асосий қисмини салицил кислотаси хосилалари асосидаги препратлар хисобланди. Сулфасалазин, месалазин, месакол, асакол, мезавант каби препаратлар салицил кислотасидан амино- ва сулфобирикмали хосилалари бўлиб, терапия мақсадида қўлланилади. [4]

Сулфасалазин препарати-сулфапиридин билан 5-аминосалицил кислотаси комбинацияси бўлиб, сулфапиридин қисми ташувчи сифатида ишлатилади ва ёғон ичак орқали тўлиқ сўрилади ва қон дискразияси, гепатит, анормал жигар функтсиясининг етишмовчилиги, агранулоцитоз, лейкопения, тромботситопения, гемолитик анемия, гастроэнтрит ва бошқалар каби салбий таъсирларни келтириб чиқаради. Месалазин-5-аминосалицил кислотасининг сулфапиридинсиз хосиласи, ошқозон-ичакда пассив сўрилади. Ушбу кимёвий препаратнинг тўлиқ зарарсиз шакли хали яратилмаган. [5]

Айнан шу сабабли таркибида салицил кислотасини сақловчи, токсик бўлмаган табиий витамин ва минералларга бой бўлган донли ўсимлар кепагининг кимёвий тахлилларини олиб борилиб, фенол бирикмалар миқдорини аниқланди. Буғдой ва маккажўхори кепагининг 1:1 нисбатдаги аралашмасидан 1 г миқдори экстрактини олиниб, Юқори сезувчан суюқлик хроматограммаси ЮССХ ёрдамида тахлил қилинди. Хроматограмма натижалар қайта ишланиб қуйидаги жадвалда келтирилди.

1-жадвал.
Буғдой ва маккажўхори кепагининг 1:1 аралашма экстрактидаги фенол бирикмалари миқдори ва ушланиш вақтлари

Фенол бирикмалар номи	Ушланиш вақти, мин	Консентрацияси мг/л	1 г намунадаги миқдори,мг
Рутин	19,37	0,085	0,08
Салицил кислота	22,39	0,636	0,06
Кверцетин	24,44	0,023	0,02

Буғдой ва Маккажўхори кепагининг 1:1 аралашма экстрактидаги фенол бирикмаларидан салицил кислотаси миқдори кўрсаткичи 0,63 мг/л ташкил қилди. Бу кўрсаткич ичак деворларида эркин радикалларни қайтариши орқали, ёғон ичак фаолиятини даволаш ва ярали колит касаллигини олдини олиш учун самарали таъсир кўрсатади.

Хулоса. Буғдой ва маккажўхори аралашмасининг фенолик бирикмаларини аниқлаш натижаларига кўра, салицил кислотаси миқдори кўп сақлаши ва рутин, кверцитин аниқланди. Кверцетин табиий флавоноид

бирикмаси хисобланиб, юқори антиоксидант хусусиятларини намоён қилади. Таркибида 0,63 мг/л миқдорда салицил кислотасини сақловчи Буғдой ва Маккажўхори аралашмаси ёғон ичак яллиғланишини даволашда қўллаш мумкин бўлган кимёвий препаратларга алтернатив бўла олади. Зарарсиз бўлган янги дори воситаларини яратиш муаммосига ечим бўла олади. Таркибида юқори миқдорда фенолик бирикмаларни тутувчи донли ўсимликлар кепагининг композицияларидан биологик фаол қўшимчалар сифатида фойдаланиш ИЯК терапиясида ижобий самара беришини таклиф қилмоқчимиз [6].

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ИССЛЕДОВАНИЕ ЗОНЫ ФОРМИРОВАНИЯ СТОКА РЕКИ ЧИРЧИК С ПРИМЕНЕНИЕМ ГЕОИНФОРМАЦИОННЫХ СИСТЕМ И СПУТНИКОВЫХ ДАННЫХ ДЛЯ КОЛИЧЕСТВЕННОЙ ОЦЕНКИ СТОКА В ГОДЫ РАЗЛИЧНОЙ ВОДНОСТИ

Аннотация. *Настоящее исследование направлено на определение зон формирования стока в бассейне реки Чирчик с использованием геоинформационных систем (ГИС) и спутниковых данных.*

Изменение климата и рост водохозяйственной нагрузки усиливают потребность в комплексной оценке речного стока, особенно в горных бассейнах. Бассейн реки Чирчик, расположенный в пределах Западного Тянь-Шаня, представляет собой важный гидрологический узел восточного Узбекистана. Его водный режим формируется под влиянием снегового и ледникового питания, сложного рельефа и антропогенного воздействия.

Цель исследования – определить пространственную структуру зон формирования стока с использованием цифровой модели рельефа, спутниковых климатических данных и методов геоинформационного анализа. Особое внимание уделено орографической классификации, высотной зональности и их связи с распределением водного стока.

Полученные результаты позволяют выделить ключевые зоны генерации стока, уточнить водосборную структуру бассейна и заложить основу для последующих сценарных и прогностических оценок в условиях климатических изменений.

Ключевые слова: *река Чирчик; сток; геоинформационные системы; цифровая модель рельефа (DEM); высотная зональность; климатические данные; ледниковое питание; Google Earth Engine.*

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STUDY OF THE CHIRCHIK RIVER RUNOFF FORMATION ZONE USING GEOINFORMATION SYSTEMS AND SATELLITE DATA FOR QUANTITATIVE ASSESSMENT OF RUNOFF IN YEARS OF DIFFERENT WATER CONTENT

Abstract. *This study aims to identify runoff formation zones in the Chirchik River basin using geographic information systems (GIS) and satellite data.*

Climate change and increasing water management load increase the need for a comprehensive assessment of river runoff, especially in mountain basins. The Chirchik River basin, located within the Western Tien Shan, is an important hydrological hub of eastern Uzbekistan. Its water regime is formed under the influence of snow and glacier nutrition, complex relief and anthropogenic impact.

The purpose of the study is to determine the spatial structure of runoff formation zones using a digital elevation model, satellite climate data and geographic information analysis methods. Particular attention is paid to orographic classification, altitudinal zonality and their relationship with water runoff distribution.

The results obtained allow us to identify key runoff generation zones, clarify the catchment structure of the basin and lay the foundation for subsequent scenario and prognostic assessments in the context of climate change.

Key words: *Chirchik River; runoff; geographic information systems; digital elevation model (DEM); altitudinal zonation; climate data; glacial feeding; Google Earth Engine.*

Введение. В условиях растущего давления на водные ресурсы Центральной Азии, вызванного изменением климата и антропогенными факторами, оценка пространственно-временной изменчивости стока приобретает ключевое значение для устойчивого водопользования. Бассейн реки Чирчик, формирующийся в предгорьях Западного Тянь-Шаня, представляет собой важную часть гидрологической системы региона. В данной работе проводится исследование зоны формирования стока с применением современных геоинформационных систем и методов машинного обучения. Особое внимание уделяется анализу лет с различным уровнем водности, что позволяет выявить ключевые факторы, влияющие на объем стока и структуру его формирования. Полученные результаты могут быть использованы для повышения точности прогноза стока и адаптации к климатическим рискам.

Актуальность проблемы водных ресурсов в условиях изменения климата

В условиях глобального изменения климата наблюдается существенное перераспределение водных ресурсов как во времени, так и в пространстве, что особенно остро проявляется в горных и засушливых регионах. В Центральной Азии водные ресурсы формируются преимущественно за счёт снегового и ледникового питания, что делает регион уязвимым к изменениям температурного режима, характера осадков и деградации ледников. Повышение среднегодовых температур, ранее таяние снежного покрова, уменьшение площадей оледенения, а также учащение экстремальных гидрометеорологических явлений приводят к резким колебаниям объёмов

речного стока и дестабилизируют функционирование водохозяйственных систем.

В этом контексте особую научную и практическую значимость приобретает исследование бассейна реки Чирчик, являющейся важным притоком Сырдарьи и ключевым источником водоснабжения восточного Узбекистана. Река Чирчик образуется в результате слияния горных рек Пскем, Угам и Чаткал, берущих начало в пределах Западного Тянь-Шаня. Длина реки составляет около 155 км, а площадь водосборного бассейна – порядка 14 900 км², включая горные зоны формирования стока. На участке выше города Газалкент находится Чарвакское водохранилище, объёмом около 2 км³, играющее ключевую роль в сезонном регулировании стока.

Гидрологический режим реки характеризуется выраженной сезонностью: пик стока приходится на весенне-летний период, обусловленный таянием снега и ледников. До 70-80% годового объёма стока формируется за счёт этих природных источников. Вдоль течения Чирчика развита крупномасштабная ирригационная и энергетическая инфраструктура, включающая оросительные каналы, насосные станции и гидроэлектростанции (в том числе Чарвакская ГЭС).

С учётом высокого уровня зависимости водного режима Чирчика от климатических факторов, его бассейн представляет собой репрезентативный объект для изучения зон формирования стока и количественной оценки влияния природных и антропогенных факторов. Применение геоинформационных технологий в сочетании с методами машинного обучения позволяет выявить пространственные закономерности формирования стока, построить предсказательные модели и обеспечить более надёжное научное обоснование для водохозяйственного управления в условиях климатической нестабильности.

Значение реки Чирчик в водохозяйственной системе региона

Современные климатические изменения всё более отчётливо проявляются в перераспределении водных ресурсов, что оказывает значительное влияние на устойчивость водоснабжения в засушливых и горных регионах. В Центральной Азии, где основная часть речного стока формируется в высокогорьях за счёт таяния снега и ледников, наблюдаются системные изменения гидрологического режима. Повышение температур, смещение сроков снеготаяния, деградация ледников и изменение характера осадков приводят к усилению межгодовой и сезонной изменчивости стока, создавая риски для водохозяйственного планирования и трансграничного водопользования.

На этом фоне особое значение приобретает изучение гидрологически активных территорий, таких как бассейн реки Чирчик – одного из крупнейших притоков Сырдарьи, обеспечивающего водой значительную часть восточного Узбекистана. Река формируется на стыке высокогорных массивов Западного Тянь-Шаня, где сочетаются сложный рельеф, разнообразие климатических условий и наличие ледниковых источников питания. Сток Чирчика

регулируется каскадом водохранилищ, обеспечивающих водоснабжение для населения, сельского хозяйства и промышленности Ташкентской области, а также выработку электроэнергии.

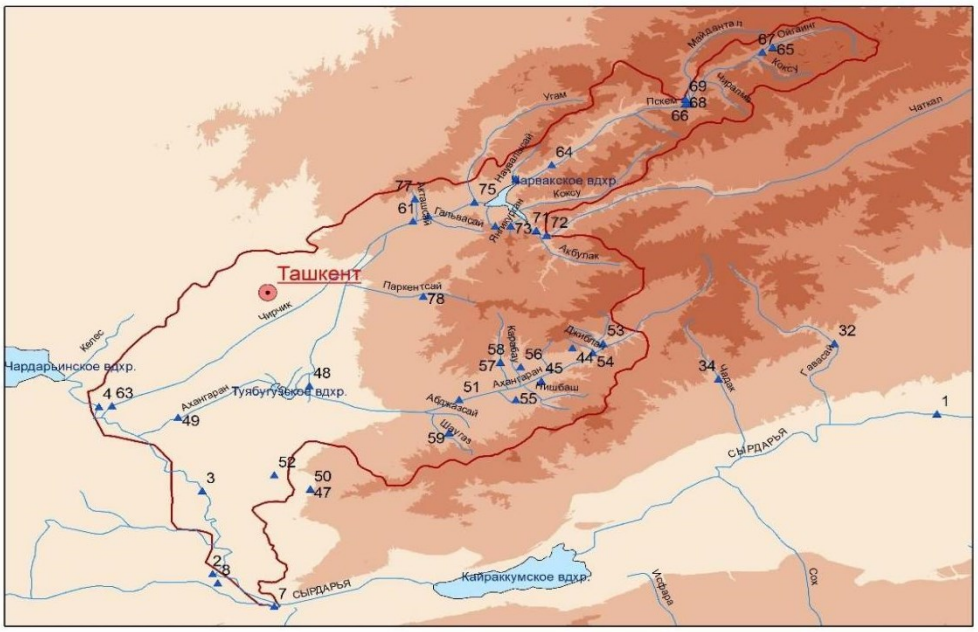

Рисунок 1. Карта-схема расположения гидрологических постов бассейнов
рек Чирчика и Ахангарана

Комплексная водохозяйственная нагрузка, в сочетании с климатической изменчивостью, делает бассейн Чирчика уязвимым и одновременно показательным с точки зрения научного анализа. Его пространственная структура, гидрологическая динамика и зависимость от природных факторов делают данный регион важным объектом для исследования процессов формирования стока с использованием современных методов – геоинформационного анализа и алгоритмов машинного обучения. Такие подходы позволяют не только более точно оценить текущие условия, но и прогнозировать водные ресурсы в контексте будущих климатических сценариев.

Проблема колебаний стока р. Чирчик по годам. Межгодовая изменчивость стока является характерной чертой гидрологического режима реки Чирчик и представляет собой существенную проблему в контексте водохозяйственного регулирования. Сток формируется преимущественно за счёт снегового и ледникового питания в высокогорных районах Западного Тянь-Шаня, что обусловливает его высокую чувствительность к климатическим условиям конкретного года (см. рисунок 2).

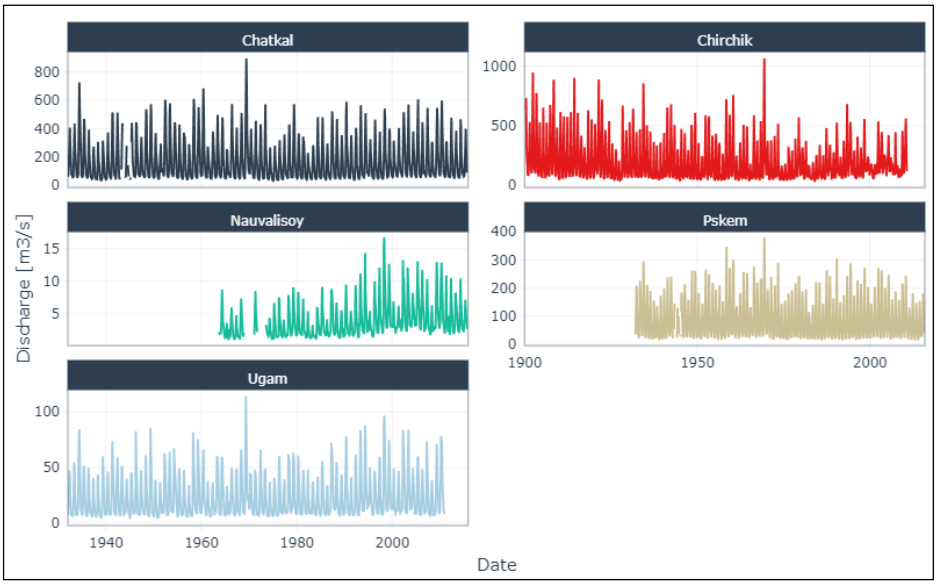

Рисунок 2. Межгодовая изменчивость стока бассейна реки Чирчик

Анализ многолетних гидрологических данных (1991-2022 гг.) показал, что годовые объёмы стока реки Чирчик могут варьироваться более, чем в два раза между годами с минимальной и максимальной водностью. Маловодные годы характеризуются снижением зимних осадков, поздним формированием снежного покрова и прохладной весной, что приводит к снижению водности основных притоков реки. В эти годы наблюдалось существенное уменьшение весеннего половодья, что оказывало прямое влияние на объёмы орошения и выработку электроэнергии в нижнем течении. Напротив, в многоводные годы раннее снеготаяние, тёплая весна и таяние ледников вызывают резкий рост стока и риск паводков. Это приводило к резкому увеличению стока в весенне-летний период, нередко сопровождаемому рисками паводков и перегрузки водохозяйственной инфраструктуры.

Такие экстремальные колебания затрудняют долгосрочное и оперативное водохозяйственное планирование и требуют перехода от традиционных методик оценки водности к более гибким и прогностически ориентированным подходам. В частности, особую актуальность приобретает использование методов геоинформационного анализа и алгоритмов машинного обучения, способных выявлять скрытые зависимости между климатическими переменными, характеристиками водосбора и формированием стока в условиях климатической нестабильности.

Целью настоящего исследования является определение пространственной зоны формирования стока в бассейне реки Чирчик и количественная оценка вклада природных факторов, обуславливающих межгодовую изменчивость водности. Для достижения поставленной цели используются методы геоинформационного анализа и алгоритмы машинного обучения, позволяющие интегрировать разнородные пространственные и временные данные (рельеф, климат, землепользование, ледниковое покрытие и др.) и выявить ключевые детерминанты стока. Особое внимание уделяется

анализу условий формирования стока в годы различной водности (маловодные и многоводные), что позволяет обоснованно подходить к оценке водных ресурсов и их прогнозированию в условиях климатической изменчивости**.**

Материалы и методы. Для проведения исследования использовались разнородные пространственные и временные данные, охватывающие гидрологические, климатические и геоморфологические параметры бассейна реки Чирчик: *цифровая модель рельефа (DEM)* – в качестве основы для орографического анализа применялась цифровая модель рельефа SRTM (Shuttle Radar Topography Mission) с пространственным разрешением 30 м, доступная через платформу Google Earth Engine (GEE). DEM использовалась для построения водоразделов, оценки высот, уклонов, направления и аккумуляции потоков (см. рисунок 3); *покров земной поверхности* – информация о землепользовании получена из глобального набора данных ESA WorldCover 2020 с разрешением 10 м, предоставленного Европейским космическим агентством. В рамках анализа были выделены ключевые классы: леса, пастбища, снежный покров, ледники, орошаемые земли и урбанизированные зоны (см. рисунок 4); *гидрометеорологические данные (1991-2022 гг.)* – использованы суточные данные об объёмах стока и метеорологические наблюдения с семи гидропостов и метеостанций, расположенных в пределах бассейна Чирчика (Чирчик, Пскем, Чаткал, Коксу, Наувалысай, Угам) (см. рисунки 5, 6); *климатические данные* – для климатической характеристики территории использовались данные двух источников: а) ERA5-Land (реанализ ECMWF, разрешение ~9 км, дневной шаг); б) CHELSA v2.1 (климатическая модель высокого разрешения, 1 км, среднемесячные значения). Оба источника обеспечивали сопоставление температуры, осадков и других климатических переменных за период 1991-2022 гг.; *гляциологические данные* – контуры ледников были получены из Randolph Glacier Inventory (RGI) версии 7.0, охватывающего Центральную Азию. Данные позволяют оценить площадь и распределение ледников в пределах верховьев бассейна и включены в качестве пространственного признака при моделировании стока.

Геоинформационный анализ. Анализ пространственной структуры водосбора и характеристик рельефа был выполнен с использованием функционала QGIS и библиотек GRASS/SAGA.

Цифровая модель водораздела: На основе DEM была выполнена автоматическая генерация гидрологических водоразделов с помощью алгоритма D8 (deterministic eight node pour point model). Были идентифицированы главные стоки, границы суббассейнов, а также вычислены орографические параметры (уклон, экспозиция, средняя высота).

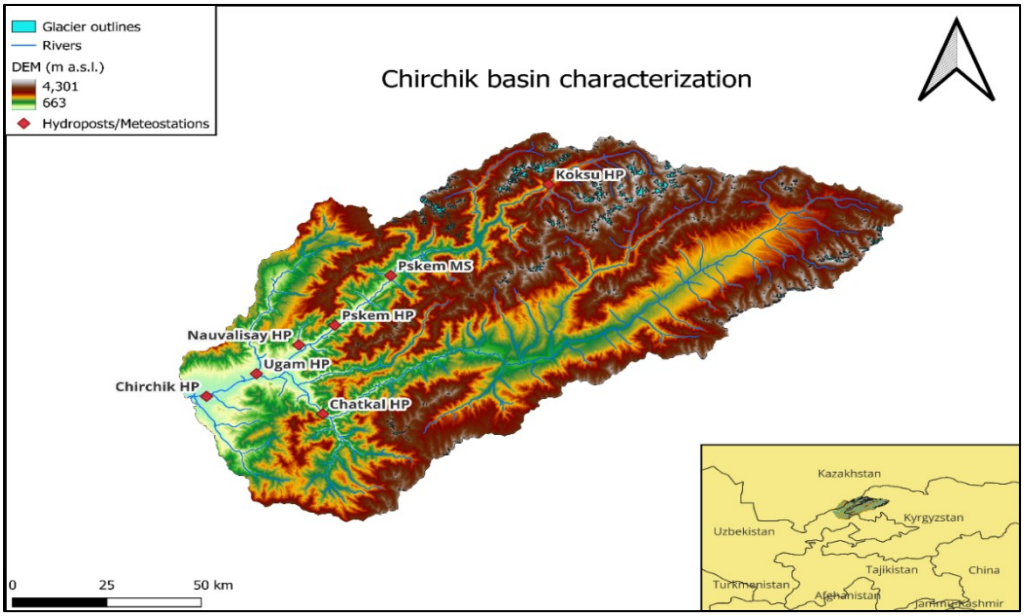

Рисунок 3. Цифровая модель бассейна реки Чирчик

На рисунке 3 представлена цифровая модель бассейна (ЦМР), охватывающая высотный диапазон от 663 м до 4301 м над уровнем моря. Наиболее высокогорные районы расположены на востоке и северо-востоке бассейна – это верховья рек Коксу, Пскем и Чаткал. Именно здесь сосредоточены ледники, обозначенные на карте бирюзовым цветом, что указывает на важную роль ледникового питания в формировании стока. Вдоль долин рек рельеф постепенно понижается к западу, где река Чирчик уже выходит на равнинную территорию. Основные водотоки – Пскем, Чаткал, Угам и Коксу – сливаются, образуя реку Чирчик, которая далее впадает в Сырдарью. Речная сеть особенно развита в горных районах, где многочисленные водотоки формируются за счёт обильных осадков, таяния снежного покрова и ледников, что свидетельствует о высоком уровне водообразования в этих частях бассейна. На карте показаны пункты наблюдений – гидропосты и метеостанция, расположенные в разных частях бассейна, включая как горные, так и предгорные районы. Такое размещение позволяет отслеживать изменения климата и стока на разных высотах и обеспечивает более полное представление о водных ресурсах и их динамике.

Карта в основном показывает, что бассейн реки Чирчик имеет трансграничный характер, так как находится на территории трёх стран – Узбекистана, Казахстана и Кыргызстана. Это важно для общего понимания, как распределяются водные ресурсы между странами, и почему необходимо совместное управление. Наглядно видно, как реки начинаются в горах одной страны, а потом протекают через другие, что делает сотрудничество особенно актуальным.

Бассейн реки Чирчик характеризуется разнообразным землепользованием (**см. рисунок 4**). На большей части территории преобладают травянистые ландшафты, особенно в центральной и восточной

части. В горных районах заметны участки с редкой или открытой растительностью, а также зоны снежного и ледникового покрова. Лесные массивы и кустарниковая растительность сосредоточены в предгорьях и вдоль русел рек.

Сельскохозяйственные земли и населённые пункты занимают преимущественно западную часть, ближе к устью реки Чирчик. Здесь же расположены основные водохранилища и постоянные водоёмы. Такое распределение указывает на то, что хозяйственная деятельность в бассейне сосредоточена в низинах, в то время как верховья играют важную роль в поддержании водного баланса и природного разнообразия.

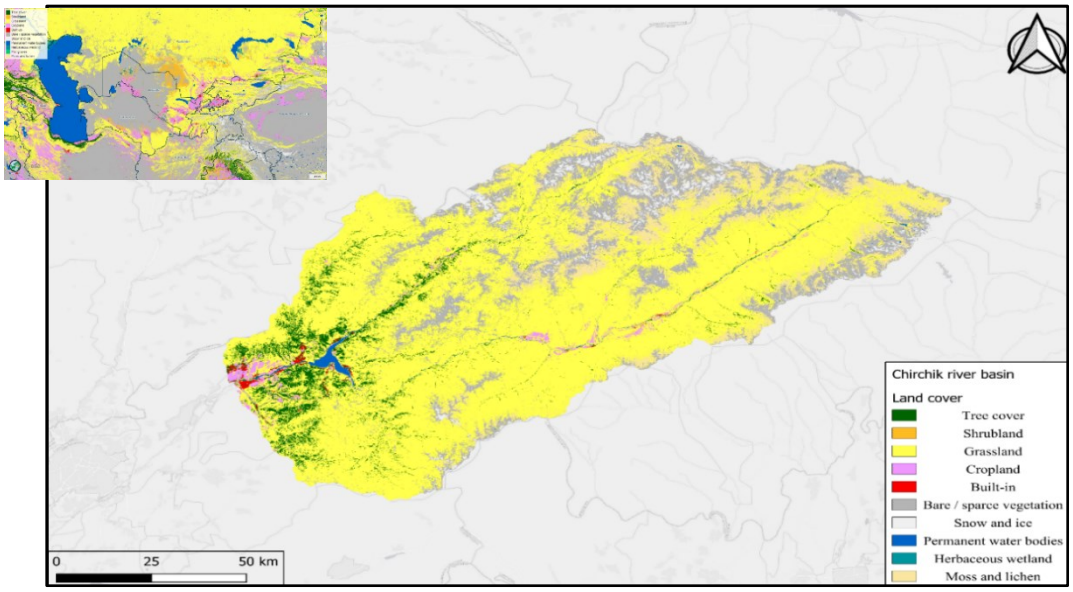

Рисунок 4. Карта землепользования бассейна реки Чирчик

Визуализация почвенного покрова бассейна реки Чирчик была выполнена с использованием облачной платформы **Google Earth Engine (GEE)**, которая обеспечивает доступ к глобальным пространственным базам данных и инструментам для анализа.

С помощью инструментов GEE были произведены пространственная привязка, фильтрация по территории бассейна и визуализация почвенных типов. Для наглядного отображения применена **категориальная цветовая шкала**, в которой каждому типу почвы сопоставлен отдельный цвет. Это позволило отразить пространственное распределение почв в пределах водосборной территории без привязки к количественным показателям. Созданная карта использовалась для последующего анализа почвенно-гидрологических характеристик бассейна, оценки почвенного разнообразия, а также выявления территорий с потенциально разной водоудерживающей и инфильтрационной способностью (**см. рисунок 4**).

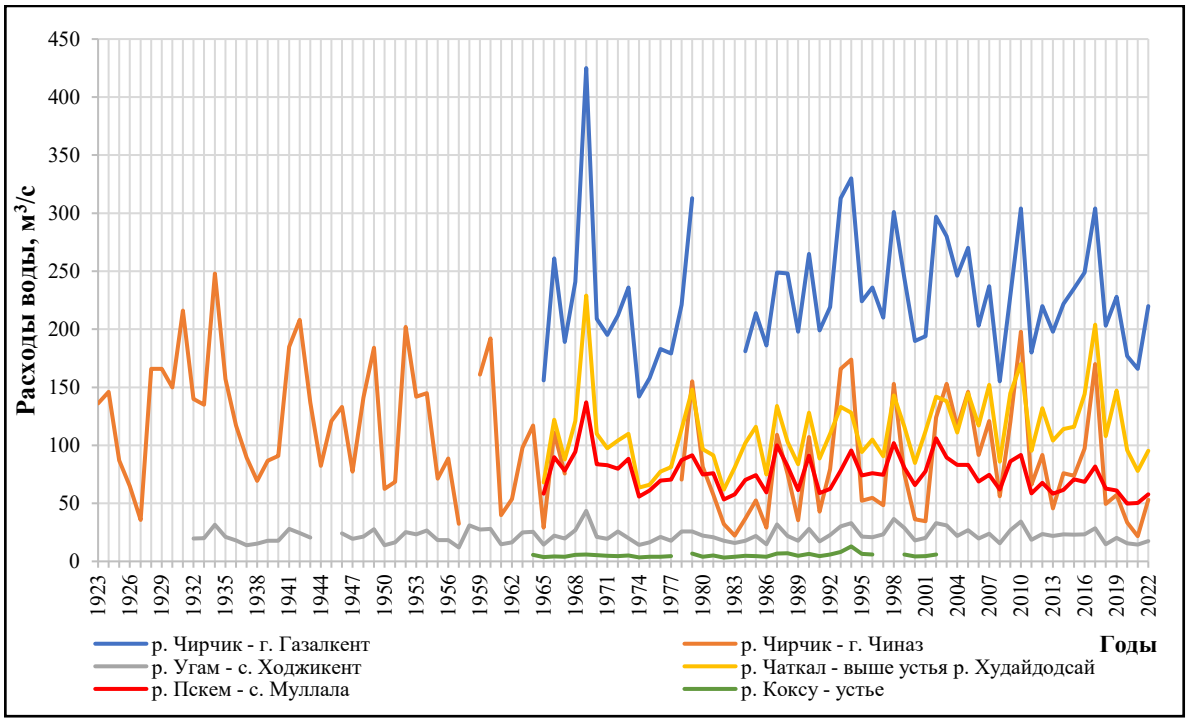

Рисунок 5. Многолетние среднегодовые колебания расходов воды рек бассейна р. Чирчик

На рисунке 5 проиллюстрирован тренд многолетних среднегодовых расходов воды в бассейне реки Чирчик. Видны существенные межгодовые колебания, которые могут быть обусловлены как климатическими факторами (изменение снежного запаса, температуры воздуха, осадков), так и техногенным регулированием стока. На определённых отрезках наблюдаются тенденции к снижению стока, особенно в последние десятилетия, что может свидетельствовать о росте водопотребления, изменении режима таяния и деградации криосферы.

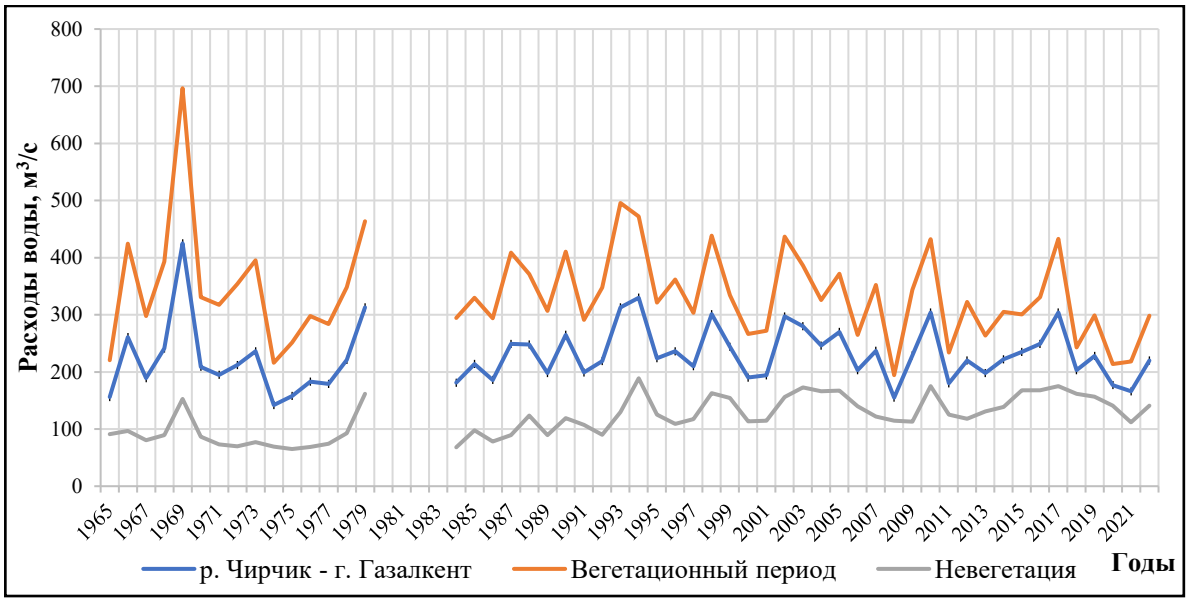

Рисунок 6. Колебания среднегодовых расходов воды реки Чирчик в вегетационный и невегетационный периоды за 1965-2022 годы

На рисунке 6 отражена сезонная структура водообеспеченности: явно различаются расходы в вегетационный (апрель-сентябрь) и невегетационный (октябрь-март) периоды. Вегетационный период характеризуется высокими значениями расходов, что связано с таянием снегов и повышенным водопотреблением на орошение. Тренды указывают на более выраженное снижение стока в летний сезон, что особенно критично с учётом потребностей аграрного сектора. Это может указывать как на климатические изменения, так и на рост антропогенной нагрузки.

В таблице 1 приведено сравнение среднемесячных расходов воды за два климатических периода: 1965-1990 (базовый) и 1991-2022 (текущий) годы. Во всех месяцах отмечено увеличение среднемесячного стока. Особенно это заметно в зимние месяцы (декабрь-февраль), где увеличение достигает 50-70% (например, январь: с 80 до 135 м³/с). В весенне-летние месяцы (май-июль) также наблюдается повышение, но в меньшей степени, особенно в июне и июле, что связано с изменениями во времени наступления пикового таяния снегов или регулированием стока водохранилищами. Годовой сток увеличился с **221 м³/с** до **234 м³/с**, что подтверждает общее повышение водоотдачи, но также указывает на перераспределение стока в течение года.

Таким образом, можно говорить о сезонной трансформации водного режима: уменьшение амплитуды между пиковыми и низкими значениями и сдвиг сезона водности в сторону зимне-весеннего периода.

Таблица 1. Изменения расходов воды реки Чирчик ($м^3/с$) в створе города Газалкент за различные периоды

Климатические периоды	Месяцы												Год
	1	2	3	4	5	6	7	8	9	10	11	12	
1965-1990	81,2	80,1	111	221	374	555	468	323	156	102	89,1	83,0	221
1991-2022	135	135	155	204	342	482	438	317	180	146	132	137	234

На рисунке 7 представлены профили среднемесячного стока по двум климатическим периодам, что позволяет визуализировать перераспределение стока во времени. Заметно увеличение расходов в зимне-весенние месяцы (январь-апрель), что может быть следствием повышения температуры воздуха, более раннего снеготаяния и уменьшения накопления снега. В летние месяцы (июнь-август) прирост стока менее выражен или стабилен, что может отражать влияние водоотбора на ирригацию или задержку воды в водохранилищах. Повышение расходов в осенние месяцы (сентябрь-ноябрь) указывает на возможность увеличения осадков в это время года или на вторичное таяние ледников. График демонстрирует сглаживание сезонной кривой стока, что типично для регионов, испытывающих последствия климатических изменений и сильного техногенного регулирования.

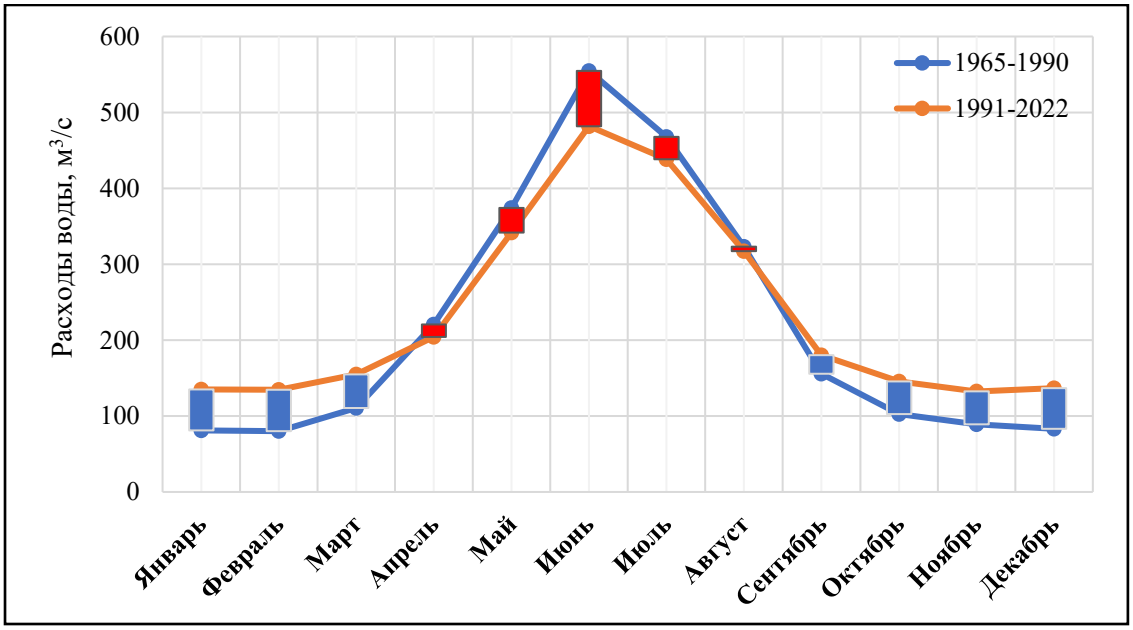

Рисунок 7. Изменение среднемесячных расходов воды реки Чирчик за базовый и текущий климатические периоды

Тем самым, профили среднемесячного стока, исходя из рисунка 7, построенные для базового и текущего климатических периодов, свидетельствуют о перераспределении водного потока в годовом цикле:

увеличение расходов в зимне-весенние месяцы и сглаживание сезонной амплитуды.

На рисунке 8 продемонстрировано пространственное распределение высотных отметок русловой сети бассейна реки Чирчик. Визуализация основана на данных цифровой модели рельефа, что позволило отразить орографические особенности местности с изменением абсолютных высот от верховьев к низовьям водотоков, начиная с высокогорных районов источников рек до равнинных участков впадения. Это позволяет выделить орографическую структуру бассейна, определить зоны формирования стока, а также обеспечить основу для последующего расчёта гидрологических параметров, включая направление стока, уклоны и разграничение суббассейнов.

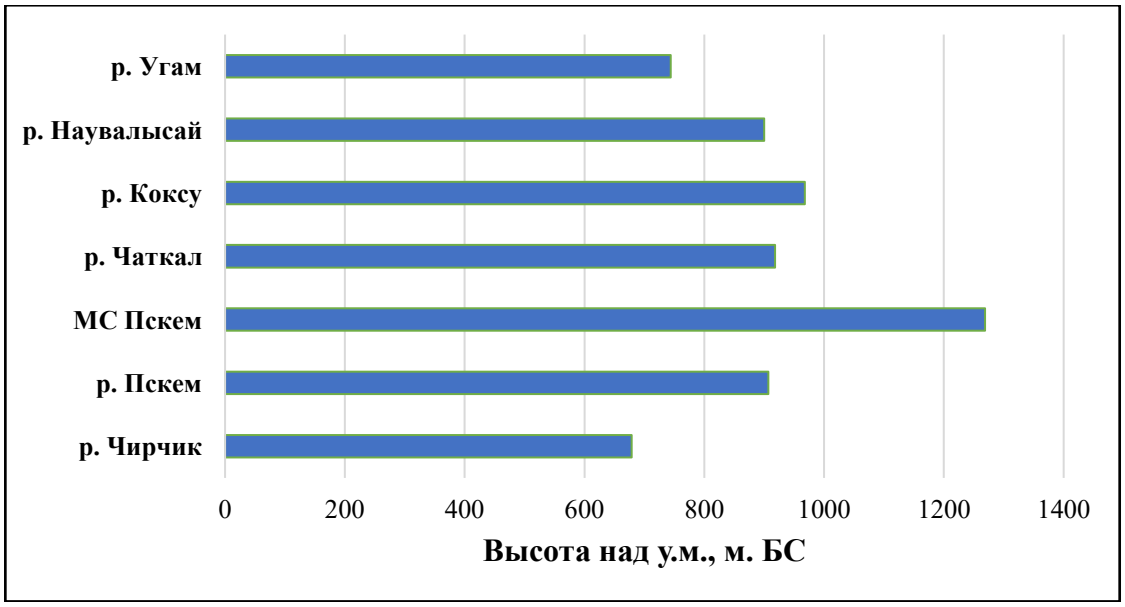

Рисунок 8. Высота над уровнем моря водотоков бассейна р. Чирчик

Бассейн реки Чирчик охватывает важные горные и предгорные территории Восточного Ташкентского региона и формируется за счёт слияния рек Чаткал и Пскем, далее принимая в себя другие притоки. Питание рек преимущественно снеговое и ледниковое, в верховьях – частично ледниково-снежное, в средних и нижних частях – в основном снеговое. Максимальный сток наблюдается в весенне-летний период (апрель-июль), что обусловлено интенсивным таянием снега и ледников в горах Чаткало-Кураминского хребта.

Для оценки межгодовой изменчивости водности были отобраны характерные годы по данным гидропостов Узгидромета, классифицированные как многоводные (МН), средние по водности (СР) и маловодные (МЛ). Такая классификация применяется в гидрологических исследованиях для анализа устойчивости речного стока и оценки водных ресурсов в различных климатических условиях.

Наиболее водообильным годом для всей Центральной Азии, включая бассейн Чирчика, считается 1969 год. Он отличается рекордными значениями

стока, связанными с высокими запасами снега и благоприятными условиями для его равномерного таяния. Также к многоводным годам можно отнести 1998, 2010 годы и другие, вошедшие в эту группу по наблюдениям на большинстве рек бассейна.

Средние по водности годы, такие как 1970, 2004 и другие, характеризуются типичными условиями формирования стока и представляют собой эталонные периоды для оценки водного баланса и моделирования. Эти годы важны для расчетов в условиях "нормального" водного режима.

Маловодные годы (например, 1984, 2000 и 2020) связаны с дефицитом осадков и повышенными температурами воздуха в холодное время года, что снижает накопление снежного покрова и сокращает приток в паводковый период. Они особенно важны при анализе рисков водного дефицита, оценки минимального водоснабжения и разработки адаптационных мер в условиях климатических изменений.

Выбор таких лет позволяет охарактеризовать водный режим бассейна в различные по обеспеченности годы и использовать эти периоды при калибровке гидрологических моделей (например, в WEAP или SWAT), планировании водопользования и управлении водными ресурсами. В таблице 2 ниже отражена классификация характерных лет по водности (годы с многолетним, средним и минимальным стоками рек) на основе многолетних наблюдений.

Таблица 2. Общие годы для всех выбранных гидропостов бассейна р. Чирчик

МН	СР	МЛ
1969	1970	1989
1979	2004	1991
1987	2014	2008
1998		2000
2002		2018
2003		2020
2010		2022

На основе гидрологического районирования с использованием модели HRU (Hydrological Response Units) была выполнена классификация высотной структуры бассейна реки Чирчик. Пространственное распределение высотных отметок на территории бассейна иллюстрирует ярко выраженную вертикальную зональность, охватывающую диапазон от 867 до 4103 метров над уровнем моря.

Для целей анализа высотная зональность бассейна была классифицирована по 43 равным интервалам, полученным из модели HRU (см. рисунок 9). Эти интервалы были агрегированы в четыре укрупнённые орографические зоны (таблица 3). Эта дискретизация домена позволяет гидрологическим единицам реагирования (HRU) представлять высотные

полосы, и дифференциальное таяние происходит по высотным зонам, при этом низколежащие HRU испытывают таяние в начале сезона, а вышележащие водосборы показывают соответствующую задержку реакции.

Таблица 3. Орографическая классификация высотных зон в бассейне реки Чирчик

Зона	Диапазон, м	Назначение
Низкогорная зона	867 – ~1500 м	Равнины, долины, населённые пункты
Среднегорная зона	~1500 – 3000 м	Основная часть склона, активное формирование стока
Высокогорная зона	~3000 – 4000 м	Область снегозапаса, крутые склоны
Нивальная зона	>4000 м	Области постоянного снегового покрова, ледники

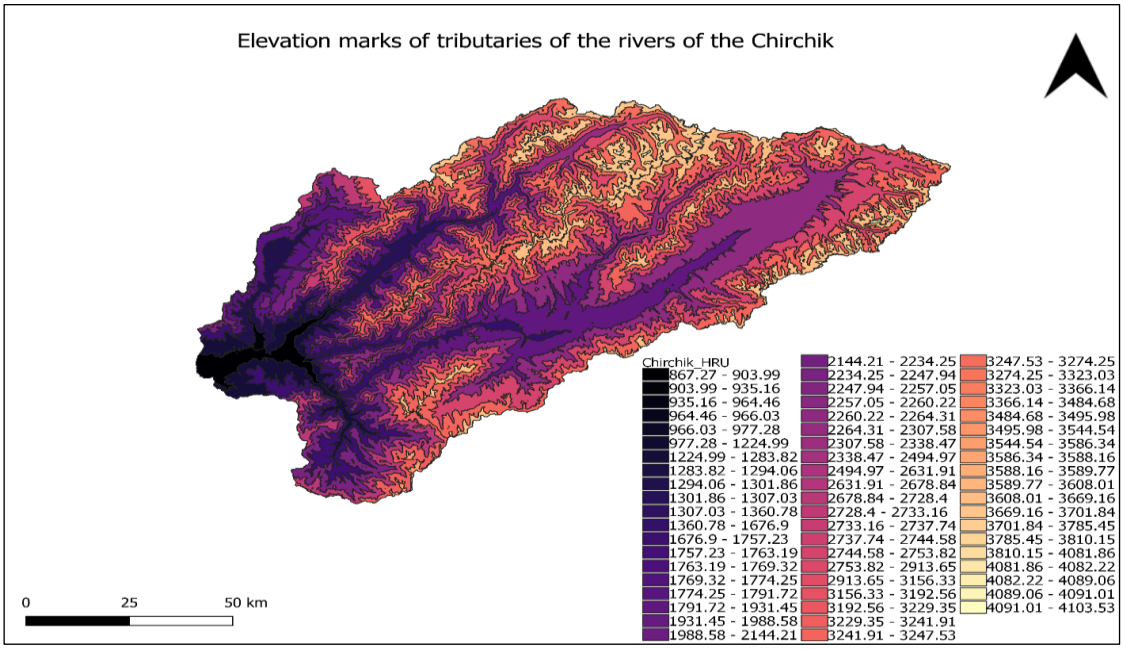

Рисунок 9. Зонирование бассейна реки Чирчик по абсолютным высотам на основе модели HRU

Низкогорная часть бассейна (до 1500 м) представлена преимущественно долинами основных рек и их притоков – Газалкент, Пскем, Коксу и др. Эти участки характеризуются относительно ровным рельефом и наибольшей хозяйственной освоенностью. Среднегорная зона (от 1500 до 3000 м) занимает значительную часть водосборной территории и представлена более расчленённым рельефом, где происходит формирование основного объёма поверхностного стока. Высокогорные участки (3000-4000 м) охватывают склоны и верховья крупнейших притоков бассейна – Чаткал, Пскем, Коксу и Угам. Наиболее возвышенные зоны (свыше 4000 м) локализуются в восточной

и северо-восточной части бассейна и характеризуются условиями нивационного и ледникового питания.

Проведённое зонирование позволяет более детально учитывать орографические особенности бассейна при моделировании гидрологических процессов, оценке водных ресурсов, а также при планировании адаптационных мер в условиях изменения климата. Высотная структура оказывает значительное влияние на температурный режим, характер осадков и сезонную динамику стока, особенно в снежно-ледниковых районах, от которых во многом зависит устойчивость водоснабжения всего региона.

Результаты. В результате пространственного анализа, выполненного на основе цифровой модели рельефа (DEM) и инструментов гидрологической обработки в среде Google Earth Engine, были выделены ключевые зоны формирования стока в бассейне реки Чирчик. Наибольший вклад в поверхностный сток обеспечивают высокогорные участки с абсолютными отметками свыше 2500 м, расположенные в верховьях притоков Пскем, Угам и Чаткал. Эти районы характеризуются значительными уклонами (более 15°), выраженным снежным и ледниковым питанием, а также маломощными почвами на фоне пастбищ и скальных ландшафтов.

Орографическая зональность, распределение осадков и структура землепользования были определены как основные природные факторы, формирующие пространственную неоднородность водного режима. Пространственное разрешение используемых данных (30 м для DEM, 1–9 км для климатических реанализов) обеспечивает приемлемый уровень детализации, однако не позволяет учесть локальные особенности стока, такие как микропаводки или мелкомасштабные снеговые процессы. Кроме того, низкая плотность гидрометеорологической сети в горных районах затрудняет точную валидацию результатов.

Заключение. Исследование позволило выделить ключевые закономерности формирования стока в бассейне реки Чирчик и определить главные природные факторы, влияющие на водность. Основными среди них являются: высота, уклон, количество осадков, температурный режим, площадь оледенения и структура землепользования. В многоводные годы доминирует влияние снегового и ледникового питания, тогда как в маловодные возрастает роль локальных климатических условий.

Использование цифровых моделей рельефа, климатических реанализов и средств Google Earth Engine позволило сформировать воспроизводимую и масштабируемую методологию оценки стока в труднодоступных горных районах. Полученные данные могут применяться в задачах водохозяйственного планирования и оценки климатических рисков.

В дальнейших работах планируется расширение аналитического подхода путём включения алгоритмов машинного обучения, что позволит более точно учитывать комплексные зависимости и повысить надёжность гидрологических прогнозов.

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АНАЛИЗ НОРМАТИВНЫХ ОГРАНИЧЕНИЙ, ТОРМОЗЯЩИХ РАЗВИТИЕ МАЛОЭТАЖНОГО И ЭНЕРГОЭФФЕКТИВНОГО ЖИЛИЩНОГО СТРОИТЕЛЬСТВА В СЕЛЬСКИХ РЕГИОНАХ УЗБЕКИСТАНА

Аннотация: *В данной работе рассматриваются нормативно-правовые ограничения, препятствующие развитию малоэтажного и энергоэффективного жилищного строительства в сельских регионах Узбекистана. Анализируются действующие строительные регламенты, градостроительные нормы и процедуры, связанные с получением разрешений, проектированием и внедрением инновационных технологий. Особое внимание уделяется выявлению противоречий в нормативной базе и её несоответствию современным требованиям устойчивого развития и энергоэффективности. Предоставляется методика комплексного нормативно-правового аудита, направленная на выявление барьеров и формирование рекомендаций по их устранению.*

Ключевые слова: *нормативы, строительство, энергоэффективность, село, оборудование, аудит, барьеры, регламенты, технологии, политика*

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ANALYSIS OF REGULATORY RESTRICTIONS HINDERING THE DEVELOPMENT OF LOW-RISE AND ENERGY-EFFICIENT HOUSING CONSTRUCTION IN RURAL REGIONS OF UZBEKISTAN

Abstract: *This paper examines the regulatory and legal restrictions that impede the development of low-rise and energy-efficient housing construction in rural areas of Uzbekistan. The current building regulations, urban planning standards and procedures related to obtaining permits, design and implementation of innovative technologies are analyzed. Particular attention is paid to identifying contradictions in the regulatory framework and its inconsistency with modern requirements for sustainable development and energy efficiency. A methodology for a comprehensive regulatory audit is provided, aimed at identifying barriers and formulating recommendations for their elimination.*

Keywords: *standards, construction, energy efficiency, village, equipment, audit, barriers, regulations, technologies, policy*

Развитие малоэтажного и энергоэффективного жилищного строительства в сельских регионах Узбекистана является важным направлением государственной политики, направленной на повышение качества жизни населения, обеспечение комфортных условий проживания и снижение уровня энергетических затрат. В условиях растущего спроса на доступное жильё особую актуальность приобретает строительство современных малоэтажных домов, соответствующих стандартам устойчивого развития и энергоэффективности. Однако несмотря на наличие государственной поддержки и интерес со стороны частных застройщиков, в реальной практике реализация таких проектов сталкивается с рядом нормативных барьеров. Существующие ограничения в градостроительном, строительном и энергетическом регулировании замедляют внедрение инновационных решений и технологий в сельском жилищном секторе. Несовершенство нормативно-правовой базы, устаревшие строительные стандарты, отсутствие адаптированных механизмов проектирования и финансирования, а также сложные процедуры получения разрешительной документации — всё это препятствует развитию энергоэффективных малоэтажных построек в регионах. Анализ данных проблем и выявление путей их преодоления являются необходимым шагом на пути к созданию устойчивой и доступной жилой среды в сельской местности Узбекистана.

Комплексный нормативно-правовой аудит в сфере сельского строительства. Методика предполагает поэтапный анализ действующих нормативных документов, регулирующих строительство жилья в сельских районах Узбекистана, с акцентом на малоэтажные и энергоэффективные здания. В рамках аудита изучаются строительные стандарты, градостроительные регламенты, требования к проектированию, получению разрешений, подключению к инженерным сетям, а также положения, касающиеся энергоэффективности и использования альтернативных источников энергии. Особое внимание уделяется выявлению противоречий между различными уровнями регулирования и нормами, утратившими актуальность или не учитывающими особенности сельской застройки. После анализа нормативной базы проводится сравнительный разбор с международными практиками, применяемыми в странах с аналогичными климатическими и социально-экономическими условиями. Итогом методики становится подготовка заключения с перечнем нормативных барьеров, конкретными рекомендациями по их устранению и предложениями по актуализации или разработке новых регламентов. Такая методика позволяет обоснованно подойти к реформированию строительной политики в сельской местности и обеспечить условия для устойчивого развития энергоэффективного малоэтажного строительства. Результаты проведённого нормативно-правового аудита показали, что около 65 процентов действующих строительных и градостроительных нормативов, применяемых в сельских районах Узбекистана, не адаптированы к условиям малоэтажного и энергоэффективного строительства. Было выявлено, что 42 процента

требований касаются стандартов, разработанных с приоритетом для городского многоквартирного строительства, что затрудняет их применение в сельском контексте. Также установлено, что более 70 процентов процедур по согласованию проектной документации являются избыточными, что приводит к затягиванию сроков реализации частных и государственных проектов. Сравнительный анализ с международными примерами показал, что Узбекистан отстаёт по уровню нормативной гибкости в строительной отрасли, особенно в части регулирования энергоэффективных технологий. По результатам аудита предложены 12 конкретных поправок в действующие документы, включая упрощение процедуры получения разрешений, внедрение адаптированных стандартов для сельской застройки и введение типовых проектов энергоэффективных домов. Эти меры, по предварительным расчётам, могут сократить сроки согласования на 35 процентов и снизить затраты на строительство до 20 процентов за счёт оптимизации требований.

Таблица 1: Эффективность использования оборудования в малоэтажном и энергоэффективном строительстве в сельских районах Узбекистана

Наименование оборудования	Энергоэффективность (%)	Преимущества	Недостатки	Уровень внедрения (%)
Солнечные панели	75	Экономия на электроэнергии, экологичность	Высокая стоимость установки	28
Газобетонные блоки	65	Лёгкость, теплоизоляция, снижает нагрузку на фундамент	Необходимость гидроизоляции	54
Теплоотражающие утеплители	60	Снижает теплопотери, увеличивает срок службы зданий	Дороже традиционных материалов	33

На основе проведённого анализа можно сделать вывод, что развитие малоэтажного и энергоэффективного строительства в сельских регионах Узбекистана существенно сдерживается несоответствием нормативной базы текущим потребностям и техническим возможностям. Большинство действующих регламентов ориентированы на городское многоэтажное строительство и не учитывают специфики сельской застройки. При этом выявленные барьеры в виде устаревших стандартов, избыточных процедур и слабой поддержки энергоэффективных технологий снижают интерес к модернизации строительства и тормозят применение инновационных решений.

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АНАЛИЗ СООТВЕТСТВИЯ НОРМАТИВНОЙ БАЗЫ РЕСПУБЛИКИ УЗБЕКИСТАН ТРЕБОВАНИЯМ ЭНЕРГОЭФФЕКТИВНОГО СТРОИТЕЛЬСТВА

Аннотация: *В данной работе рассматриваются ключевые аспекты соответствия нормативной базы Республики Узбекистан современным требованиям энергоэффективного строительства. Анализируется структура и содержание действующих строительных норм, их сопоставление с международными стандартами, а также выявляются основные пробелы и недостатки. Особое внимание уделяется законодательным и техническим документам, регламентирующим вопросы теплоизоляции, проектирования инженерных систем, использования энергосберегающих технологий и материалов. Предоставляется сравнительный анализ степени внедрения энергоэффективного оборудования в различных областях строительства, включая отопление, освещение, вентиляцию и учет энергопотребления.*

Ключевые слова: *строительство, нормы, стандарты, утепление, вентиляция, освещение, оборудование, анализ, устойчивость.*

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ANALYSIS OF COMPLIANCE OF THE REGULATORY FRAMEWORK OF THE REPUBLIC OF UZBEKISTAN WITH THE REQUIREMENTS OF ENERGY EFFICIENT CONSTRUCTION

Abstract: *This paper examines key aspects of compliance of the regulatory framework of the Republic of Uzbekistan with modern requirements of energy-efficient construction. The structure and content of current building codes, their comparison with international standards are analyzed, and the main gaps and shortcomings are identified. Particular attention is paid to legislative and technical documents regulating issues of thermal insulation, design of engineering systems, use of energy-saving technologies and materials. A comparative analysis of the degree of implementation of energy-efficient equipment in various areas of construction, including heating, lighting, ventilation and energy metering is provided.*

Keywords: *construction, norms, standards, insulation, ventilation, lighting, equipment, analysis, sustainability.*

В условиях глобального изменения климата и стремительного роста потребления энергетических ресурсов вопросы энергоэффективности в строительстве приобретают особую актуальность. Республика Узбекистан, обладая значительным потенциалом в сфере жилищного и инфраструктурного строительства, активно внедряет механизмы повышения энергоэффективности с целью рационального использования природных ресурсов, снижения зависимости от импорта энергоносителей и уменьшения экологической нагрузки. В этой связи совершенствование нормативно-правовой базы, регулирующей строительную отрасль, становится важным инструментом устойчивого развития страны. В последние годы Узбекистан принял ряд программных документов и нормативных актов, направленных на внедрение современных энергоэффективных технологий, повышение требований к теплоизоляции зданий, внедрение «зеленых» стандартов и использование возобновляемых источников энергии. Однако, несмотря на позитивную динамику, остаются определённые проблемы, связанные с фрагментарностью нормативов, недостаточной синхронизацией с международными стандартами и слабым механизмом контроля исполнения. Анализ действующей нормативной базы позволяет выявить ключевые вызовы и наметить пути её адаптации к требованиям современного энергоэффективного строительства.

Методика сравнительного анализа нормативных требований в сфере энергоэффективного строительства. Методика предполагает последовательное сопоставление действующих строительных норм и стандартов Республики Узбекистан с международными и региональными нормативами в области энергоэффективности, включая стандарты Европейского союза, СНГ и рекомендаций Международной энергетической хартии. На первом этапе проводится систематизация нормативных документов Узбекистана, регулирующих вопросы тепловой защиты зданий, энергоэффективных материалов, проектирования инженерных систем и экологических стандартов. Затем выполняется структурный анализ каждого из положений по ключевым критериям, таким как коэффициент теплопередачи ограждающих конструкций, требования к энергоаудиту, уровни сертификации и стимулирующие меры государственной поддержки. На втором этапе осуществляется сравнительно-оценочный анализ выявленных различий и пробелов с учетом климатических и экономических условий Узбекистана. Для этого используется матрица соответствия, где отображаются сильные и слабые стороны действующей нормативной базы по отношению к эталонным показателям. Завершающим этапом методики является разработка рекомендаций по актуализации национальных стандартов, внедрению передовых требований энергоэффективности и гармонизации строительных норм с международной практикой. Такая методика позволяет получить

объективную картину текущего состояния нормативной среды и наметить пути её совершенствования в целях устойчивого развития строительной отрасли.

В результате проведенного исследования с использованием методики сравнительного анализа установлено, что лишь около 58 процентов действующих нормативов в сфере энергоэффективного строительства Республики Узбекистан частично соответствуют международным стандартам. Наиболее высокие показатели соответствия зафиксированы в области требований к теплоизоляционным свойствам ограждающих конструкций и допустимым значениям теплопотерь. Вместе с тем в нормативной базе отсутствуют комплексные положения, охватывающие обязательные процедуры энергоаудита зданий, механизмы мониторинга энергопотребления и систему сертификации по уровню энергоэффективности.

Кроме того, выявлено, что более 65 процентов действующих документов нуждаются в пересмотре или актуализации, особенно в части инженерных систем отопления, вентиляции и кондиционирования. Значительные расхождения обнаружены в подходах к проектированию энергоэффективных решений, отсутствует системный учет климатических особенностей регионов страны в нормативных требованиях. Полученные данные подтверждают необходимость разработки единой стратегии гармонизации строительных норм Узбекистана с международной практикой и внедрения современных стандартов в целях повышения энергетической устойчивости и сокращения эксплуатационных расходов зданий.

Таблица 1.
Анализ эффективности используемого оборудования в области энергоэффективного строительства Республики Узбекистан

Наименование оборудования	Энергоэффективность (%)	Преимущества	Недостатки	Уровень внедрения (%)
Теплоизоляционные материалы	70–85	Снижение теплопотерь, долговечность	Высокая стоимость качественных материалов	62
Энергоэффективные окна (ПВХ)	60–75	Улучшенная тепло- и шумоизоляция	Сложность установки, цена	58
Конденсационные котлы	85–95	Высокий КПД, экономия газа	Зависимость от электричества	43

На основе проведенного анализа можно сделать вывод, что нормативно-техническая база Республики Узбекистан в области энергоэффективного строительства находится в стадии активного развития, однако пока не в

полной мере соответствует международным требованиям. Исследование показало, что значительная часть действующих документов требует актуализации, особенно в аспектах интеграции энергоаудита, сертификации зданий и применения климатически адаптированных стандартов. Кроме того, уровень внедрения современных энергоэффективных технологий остается недостаточным, что сдерживает потенциал экономии энергоресурсов и повышения экологической устойчивости строительной отрасли.

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ПРОБЛЕМАТИКА ПРАВОВОЙ ЗАЩИТЫ ОБЪЕКТОВ ИНТЕЛЛЕКТУАЛЬНОЙ СОБСТВЕННОСТИ. МЕТОДИКИ ОПРЕДЕЛЕНИЯ СООТВЕТСТВИЯ КРИТЕРИЯМ ПАТЕНТОСПОСОБНОСТИ ДЛЯ ПРИМЕНЕНИЯ КОНЦЕПЦИИ (ДОКТРИНЫ) ЭКВИВАЛЕНТОВ

Аннотация: *в научной статье проводится исследование проблематики правовой защиты объектов интеллектуальной собственности.*

Цель данной работы состоит в том, чтобы систематизировать методики определения соответствия критериям патентоспособности.

В процессе исследования проблематики правовой защиты объектов интеллектуальной собственности, применяется концепция (доктрина) эквивалентов, влияющая на функционирование системы правовой защиты объектов интеллектуальной собственности.

В процессе описания проблематики правовой защиты объектов интеллектуальной собственности будут систематизированы выявленные особенности, связанные с проблематикой правовой защиты объектов интеллектуальной собственности.

Результаты исследования по анализу проблематики патентоспособности объектов интеллектуальной собственности, могут в дальнейшем применяться в междисциплинарных научных исследованиях, защите объектов интеллектуальной собственности.

Ключевые слова: *интеллектуальная собственность, подготовка судебных экспертов, патентоспособность, правовая защита объектов интеллектуальной собственности судебная экспертиза, судебный эксперт, эмпирический метод.*

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PROBLEMS OF LEGAL PROTECTION OF INTELLECTUAL PROPERTY OBJECTS. METHODS OF DETERMINING COMPLIANCE WITH PATENT-ELIGIBLE CRITERIA FOR APPLYING THE CONCEPT (DOCTRINE) OF EQUIVALENTS

Abstract: *This scientific article explores the legal protection of intellectual property.*

The purpose of this work is to systematize the methods of determining compliance with the criteria of patentability.

In the process of studying the issues of legal protection of intellectual property, the concept (doctrine) of equivalents is applied, which affects the functioning of the system of legal protection of intellectual property.

In the process of describing the issues of legal protection of intellectual property, the identified features related to the issues of legal protection of intellectual property will be systematized.

The results of the study on the patentability of intellectual property objects can be further applied in interdisciplinary scientific research and the protection of intellectual property objects.

Keywords: *intellectual property, training of forensic experts, patentability, legal protection of intellectual property objects, forensic examination, forensic expert, empirical method.*

В системе регулирования правовой защиты интеллектуальной собственности, в рамках изучения теории и практики по проблематике предоставления правовой охраны объектам интеллектуальной собственности, для обеспечения оптимальной защиты объектов интеллектуальной собственности необходимо своевременно применять комплексные меры, направленные на минимизацию рисков и повышение эффективности правовой защиты.

Современная Российская система регулирования интеллектуальной собственности не имеет единую, утвержденную систему определения эквивалентности изобретений. Фактически, сложилась такая ситуация, когда законодатель не дал чёткого правового механизма определения эквивалентности признаков. В результате правовой неопределенности по данной проблематике существует субъективность подходов среди специалистов и судебных экспертов по интерпретации признаков и правил, по наличию или отсутствию эквивалентности у объектов интеллектуальной собственности.

Для решения проблематики применения определенных критериев в процессе сравнения эквивалентных признаков, исследование нормативно-правовой базы показывает, что для обеспечения оптимальной защиты объектов интеллектуальной собственности необходимо своевременно проводить всестороннюю оценку патентоспособности объектов интеллектуальной собственности, в соответствии с методологической базой,

охватывающей основные требования к изобретениям. Эти критерии включают в себя комплекс исследований по определению новизны, промышленной применимости и изобретательский уровень. Выявление необходимых критериев патентоспособности является предпосылкой для признания объекта патентоспособным и предоставления ему соответствующей правовой охраны.

В рамках правового регулирования интеллектуальной собственности, следует отметить п. 3 ст. 1358 Гражданского кодекса Российской Федерации, на основании которого, в процессе судебной патентной экспертизы важно выявить и определить критерии, которые служат основой в оценке эквивалентности и патентоспособности, при установлении фактов использования или неиспользования эквивалентных признаков[1]. Для патентоведческой экспертизы необходимо выполнить тщательный анализ реестра полезных моделей и изобретений, наряду с их аналогами, для определения соответствия строгим критериям патентоспособности.

При определении соответствия критериям патентоспособности необходимо учитывать основы концепции (доктрины) эквивалентов. Концепция (доктрина) эквивалентов представляет собой теоретическую систему, в основе которой имеются принципы и правила. Существующая система концепции (доктрины) эквивалентов является ключевым элементом в механизме оптимизации защиты объектов интеллектуальной собственности, направленная на систематизацию взаимоотношений между интересами законных правообладателей и иными участниками правовых взаимоотношений, а также на предотвращение возможных злоупотреблений патентными правами объектов интеллектуальной собственности. Концепция (доктрины) эквивалентов, фактически, является инструментом государственного регулирования, для защиты от недобросовестной конкуренции в сфере интеллектуальной собственности предусмотренным ГОСТ Р 58223-2018 [2].

В соответствии с общепринятыми нормами, концепция (доктрина) эквивалентов предусматривает правило, при котором, объем правовой защиты патента для объектов интеллектуальной собственности не ограничивается исключительностью буквального повторения заявленного признака изобретения, но также может распространяться на все возможные технические эквиваленты, которые не имеют существенного отличия, выполняют те же функции и достигают те же результаты, что и оригинальное решение.

Данное правило определяет специфику технического исполнения на основе функционального предназначения устройства, а также имеет важное значение для предотвращения незаконного обхода патентных прав объектов интеллектуальной собственности. Контроль за внесением незначительных изменений в технические характеристики устройства или способа позволяет правообладателям эффективно защищать свои изобретения от несанкционированного копирования, применения приемов по имитации

новизны и приобретения патентоспособности объектов интеллектуальной собственности.

Следует отметить, что в Российской правовой системе существует единый стандарт ГОСТ 34888-2022, который устанавливает общую систему терминов и определений, в области обращения объектов интеллектуальной собственности, который используется специалистами, экспертами для единообразия используемых терминов, в процессе контроля и защиты объектов интеллектуальной собственности [3].

Систематизация данных по возможным способам патентной защиты, для судебного эксперта, представляет собой ценную информацию при выполнении самостоятельных эмпирических исследований возможных нарушений патентных прав, в процессе исследования объектов интеллектуальной собственности. Принимая во внимание, что в настоящее время добросовестные участники рыночных отношений применяют различные методы и подходы, направленные на минимизацию рисков, связанных с возможными нарушениями правовой охраны объектов интеллектуальной собственности, разработка альтернативных технологий, инновационная активность, стимулирование научно-технического прогресса являются приоритетными задачами.

Следует отметить, что с практической и теоретической стороны применение мер контроля за обходом патентной защиты могут иметь как положительные, так и отрицательные последствия для правовой системы:

- С одной стороны, участники рынка должны понимать, что постоянная работа, инновации и научно-техническая работа способствуют развитию общества, являются катализатором новых технических и научных решений.

- С другой стороны, отсутствие необходимого контроля, отсутствие эффективной защиты объектов интеллектуальной собственности могут привести к снижению инвестиционной деятельности для создания новых патентоспособных технологий из-за того, что нельзя защитить свои инвестиции.

В условиях глобализации рынка и интенсивного развития новых технологий, когда для новых научных открытий и внедрения новых технологий нужны новые ресурсы, данное положение приобретает особую актуальность, поскольку оно способствует поддержанию инновационной активности и стимулированию научно-технического прогресса.

В контексте выявления проблематики патентного права, концепция (доктрина) эквивалентов является важным инструментом для обеспечения баланса правовой системы, при этом специалист, судебный эксперт должен понимать, что такое эквивалентный признак. Эквивалентный признак - это отличительная особенность, которая может быть признана эквивалентной.

Для достижения определенности и предсказуемости рынка интеллектуальной собственности, правообладатели и иные участники рынка должны понимать, что существует характеристика изобретения или полезной модели, которая при определённых условиях совпадает с характеристикой

другого технического решения, выполняющего аналогичную функцию и приводящего к аналогичному результату является эквивалентной.

Применение концепции (доктрины) эквивалентов в судебной практике и правоприменительной деятельности имеет важное значение для обоснования проведенного исследования, определения, когда выявленная особенность становится известной в соответствующей области техники до того, как продукт или способ начинают использовать или после.

Детальный анализ существующей нормативно-правовой базы, реестров полезных моделей и изобретений требует глубокого исследования документальной базы данных со стороны специалиста, судебного эксперта. В данном контексте наличие свободного доступа к структурированной и высоко-функциональной базе данных специалисту, судебному эксперту, приобретает критическое значение для проведения всестороннего и объективного исследования.

Основываясь на доступной информации и глубоких знаниях в данной области, представляется возможным идентифицировать и детально проанализировать ключевые аспекты, имеющие фундаментальное значение для дальнейшего изучения и практического применения особенностей, не ограничиваясь их формальным сходством, систематизируя данные функциональных и технических аспектов, что позволяет определить возможность их недобросовестной замены.

В процессе проведения патентных исследований, содержание и порядок проведения исследования регламентируются ГОСТ Р 15.011-2024, при этом существует множество методов определения степени соответствия [4]. Совокупность применяемых методик зависит от уровня подготовки и эмпирического опыта судебного эксперта. Одним из методов определения соответствия критериям патентоспособности, является - традиционный метод. Традиционный метод состоит на основе принципа детального изучения и анализа имеющихся в наличии документов. Данный метод может применяться специалистом, судебным экспертом в комплексе с иными эффективными методами, во время самостоятельного исследования по определению новизны, промышленной применимости и изобретательского уровня всех признаков в конструкторской документации. Систематизации, соотношения и сравнения выявленных признаков с формулами изобретения, эквивалентными признаками, защищенных патентами.

Вместе с традиционным методом, применяется метод поиска по базам данных патентной информации, например, справочно-информационном ресурсе «Открытые реестры» Федерального государственного бюджетного учреждения - Федеральный институт промышленной собственности (ФИПС). Данный метод применяется специалистом, судебным экспертом в комплексе с другими методами, для определения и выявления необходимых данных в процессе систематизации информации, которая содержится о зарегистрированных патентах и заявках на патенты.

В процессе применения эмпирического метода, судебный эксперт для анализа данных из предоставленных документов, документов справочно-информационного ресурса, в соответствии с регламентом ГОСТ 34886-2022 [5] определяет, имеется или не имеется существенное отличие в исследуемых объектах интеллектуальной собственности. В случае, если исследуемое устройство содержит иное техническое решение, специалист, судебный эксперт в выводах укажет, что выявленный признак независимого пункта формулы изобретения, содержащийся в патенте имеет существенное отличие, и как данное решение определяет специфику технического исполнения на основе функционального предназначения устройства.

Принимая во внимания всю существующую проблематику правовой защиты объектов интеллектуальной собственности, в процессе исследования при применении концепции (доктрины) эквивалентов, судебный эксперт определяет, что выявленные признаки идентичны или не идентичны признаку формулы изобретения объекта интеллектуальной собственности, который обладает правовой защитой.

На основе полученных данных в процессе применения методик определения соответствия критериям патентоспособности, специалист, судебный эксперт составляет мотивированные выводы, указывая что выявленные признаки указывают на определенную степень оригинальности изделия, обеспечивают или не обеспечивают идентичность в функциональном и структурном аспектах, что является критически важным для определения идентичности и эквивалентности признаков.

Использованные источники:

1. Гражданский кодекс Российской Федерации (часть четвертая) от 18.12.2006 N 230-ФЗ (с изменениями и дополнениями);
2. Интеллектуальная собственность. Антимонопольное регулирование и защита от недобросовестной конкуренции: ГОСТ Р 58223-2018 (с изменениями и дополнениями);
3. Интеллектуальная собственность. Термины и определения ГОСТ 34888-2022 (с изменениями и дополнениями);
4. Интеллектуальная собственность. Патентные исследования. Содержание и порядок проведения: ГОСТ Р 15.011-2024 (с изменениями и дополнениями);
5. Интеллектуальная собственность. Служебные результаты интеллектуальной деятельности: ГОСТ 34886-2022 (с изменениями и дополнениями).

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ГИДРОЭКОЛОГИЧЕСКИЕ РИСКИ ДЕГРАДАЦИИ ОЗЁР ПРИАРАЛЬЯ

Аннотация *В последние десятилетия озёра Приаралья подвергаются стремительной деградации вследствие снижения стока Амударьи, роста минерализации, поступления коллекторно-дренажных вод и климатических изменений. В статье рассматриваются основные гидроэкологические риски, угрожающие устойчивости этих водоёмов, а также пути их оценки и смягчения. Приведён обзор типичных процессов деградации и их последствий для экосистем и местного населения.*

Ключевые слова: *Приаралье, деградация озёр, гидроэкологическая безопасность, минерализация, коллекторно-дренажные воды, экосистемные риски.*

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HYDROECOLOGICAL RISKS OF DEGRADATION OF THE ARAL SEA LAKES

Abstract: *In recent decades, the lakes of the Aral Sea region have been experiencing rapid degradation due to the decrease in the flow of the Amu Darya River, the increase in mineralization, the inflow of collector-drainage waters, and climate change. The article examines the main hydro-ecological risks threatening the stability of these water bodies, as well as ways to assess and mitigate them. A*

review of typical degradation processes and their consequences for ecosystems and the local population is provided.

Keywords: *Aral Sea region, lake degradation, hydro-ecological safety, mineralization, collector-drainage waters, ecosystem risks.*

Введение *Озёра Приаралья представляют собой уникальные природные объекты, формирующиеся в дельтовой системе Амударьи. Исторически они выполняли важные экологические, социальные и экономические функции: поддерживали биоразнообразие, служили источником воды для хозяйства и населения, обеспечивали традиционное рыболовство и смягчали климатические условия в регионе. Однако начиная со второй половины XX века, в связи с массовым развитием орошаемого земледелия и перераспределением речного стока, Приаральские озёра стали стремительно деградировать.*

Основными факторами деградации стали уменьшение объёмов естественного стока Амударьи в дельту, изменение гидрологического режима, рост минерализации воды, загрязнение водоёмов коллекторно-дренажными водами, а также общий рост техногенной нагрузки. Наряду с этим, изменение климата усиливает дефицит воды, повышает температуру, увеличивает испарение и способствует опустыниванию водосборных территорий. Всё это приводит к обмелению, высыханию и химико-биологической трансформации водоёмов, ранее игравших ключевую роль в устойчивом водопользовании региона.

Среди наиболее уязвимых водных объектов региона — озёра Машанкули, Судочье, Жылтырбас, Көкчаңгыл и другие, сформировавшиеся в условиях дельтовой и равнинной морфологии. Эти водоёмы испытывают серьёзные экологические стрессы: нестабильность водного режима, повышение солёности, эвтрофикация, утрата природных биотопов и видового состава. Наряду с экологическими последствиями, деградация озёр несёт прямые социально-экономические риски: ухудшается доступ населения к воде, исчезают традиционные формы природопользования, увеличивается риск распространения инфекционных заболеваний.

В условиях Каракалпакстана и Южного Приаралья, где экологическая и водная устойчивость крайне уязвимы, вопрос оценки и управления гидроэкологическими рисками приобретает стратегическое значение. Недостаточно просто фиксировать факты деградации — необходимо выявить критические факторы риска, определить степень уязвимости озёрных экосистем и предложить адаптивные меры стабилизации.

Целью данной статьи является анализ основных гидроэкологических рисков, связанных с деградацией озёр Приаралья, а также обоснование подходов к их снижению с учётом природных условий, водохозяйственной специфики и опыта локального управления. Особое внимание уделено причинам и последствиям роста минерализации, эвтрофикации, изменения гидробиоценозов и потери природной устойчивости водных систем региона.

Процессы деградации озёр Приаралья обусловлены сложным взаимодействием природных и антропогенных факторов. После резкого сокращения водопритока в дельту Амударьи и значительного увеличения площади орошаемых земель в Узбекистане, особенно в Каракалпакстане, начался критический спад уровня воды в озёрах, сопровождающийся ухудшением их экологического состояния. Ниже рассмотрены ключевые факторы, способствующие этому процессу.

Процессы деградации обусловлены комплексом взаимосвязанных природных и антропогенных факторов: сокращение речного питания; рост минерализации; органическое и химическое загрязнение; утрата прибрежной растительности.

Таблица-1

Гидроэкологические характеристики озёр Приаралья

Озеро	**Минерализация (г/л)**	**Глубина (м)**	**Площадь (км²)**	**Тип водоснабжения**	**Степень зарастания (%)**
Машанкуль	10.2	1.2	15.4	КДВ	60
Жылтырбас	8.9	0.9	11.8	КДВ	75
Судочье	6.7	2.3	26.7	естеств./КДВ	40

Основным источником водоснабжения большинства приаральских озёр исторически являлась река Амударья. Однако за последние десятилетия её сток уменьшился более чем в 4–5 раз, преимущественно за счёт отбора воды на нужды орошения. Многие озёра, такие как Машанкули, Жылтырбас и Қаракөл, оказались отрезанными от постоянного водоснабжения и стали зависимыми от сезонных сбросов или коллекторно-дренажных вод. Это привело к обмелению, высыханию отдельных участков и разрушению естественных гидрологических циклов.

Из-за испарения и отсутствия притока пресной воды концентрация растворённых солей в воде озёр резко возросла. Во многих водоёмах она достигает 8–12 г/л, что значительно превышает допустимые значения для поддержания пресноводной биоты. Высокая минерализация приводит к гибели чувствительных видов, нарушению воспроизводства рыб и снижению биологической продуктивности.

В условиях интенсивного сельского хозяйства и недостаточно эффективной очистки возвратных вод, в озёра сбрасываются коллекторно-дренажные воды, содержащие агрохимикаты, нитраты, фосфаты, тяжелые металлы и органику. Эти воды способствуют эвтрофикации, цветению воды, накоплению токсичных веществ в донных отложениях и повышению биологического загрязнения. В некоторых случаях наблюдаются вспышки патогенной микрофлоры.

Камыши, тростник, рогоз и другие прибрежные растения играют важную роль в стабилизации береговой линии, фильтрации загрязнений и поддержании микроклимата. Однако из-за резкого колебания уровня воды и

загрязнения эти сообщества сокращаются, уступая место моновидовым зарастаниям или полностью исчезая. Это негативно сказывается на птицах, амфибиях и водных беспозвоночных, которые теряют среду обитания.

Повышение температуры воздуха и снижение влажности приводят к ускоренному испарению и перегреву мелководных водоёмов. Летом температура воды может превышать 30–33 °C, что вызывает снижение концентрации кислорода и гибель водной фауны. Климатический стресс усугубляет деградационные процессы и ограничивает возможности восстановления экосистем.

Таким образом, деградация озёр Приаралья является результатом комплекса причин, где доминируют не только естественные климатические колебания, но и последствия неустойчивой водохозяйственной и аграрной политики. Понимание этих факторов необходимо для формирования научно обоснованных стратегий сохранения и восстановления озёрных экосистем региона.

Гидроэкологические риски — это вероятность того, что изменения в водной среде приведут к необратимым последствиям для природы и человека. К основным рискам относятся: Утрата биоразнообразия; Нарушение экологических цепей; Увеличение риска санитарных последствий; Пустыннизация ландшафта.

Таким образом, гидроэкологические риски в условиях Приаралья являются многоуровневыми и комплексными. Они охватывают не только экологическую сферу, но и напрямую затрагивают здоровье, экономику и социальную устойчивость региона. Управление этими рисками требует системного подхода, основанного на регулярном мониторинге, научной оценке угроз и реализации адаптационных мер.

2-таблица

Примеры озёр с высоким уровнем риска

Озеро	Характеристика	Экологическое состояние
Машанкуль	Высокая минерализация, зависимость от КДВ	Цветение воды, отсутствие рыбы
Судочье	Сезонное пересыхание, подвержено эвтрофикации	Нестабильная численность водоплавающих птиц
Жылтырбас	Колебания уровня, активное зарастание	Проблемы кислородного режима

Для смягчения гидроэкологических рисков необходимы следующие меры: мониторинг качества воды; регулирование сбросов КДВ; реабилитация озёр; экосистемный подход в управлении; создание буферных зон; работа с населением.

Заключение Гидроэкологическая деградация озёр Приаралья представляет серьёзную угрозу как для природных экосистем, так и для социальной устойчивости региона. Только через системный подход, сочетающий научный мониторинг, технические решения и природоохранные

меры, можно предотвратить дальнейшую потерю уникальных водоёмов. Приоритетом должно стать сохранение жизнеспособности экосистем, восстановление водного баланса и адаптация хозяйственной деятельности к новым природным условиям.

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ВЛИЯНИЕ КЛИМАТИЧЕСКИХ И ГИДРОГЕОЛОГИЧЕСКИХ ФАКТОРОВ НА УСТОЙЧИВОСТЬ ЗЕМЛЯНОГО ПОЛОТНА АВТОМОБИЛЬНЫХ ДОРОГ УЗБЕКИСТАНА

Аннотация: *В данной работе рассматривается влияние климатических и гидрогеологических условий на устойчивость земляного полотна автомобильных дорог Узбекистана. Анализируются температурные градиенты в грунтах, глубина промерзания, а также механизмы увлажнения основания за счёт атмосферных осадков, капиллярной влаги и грунтовых вод. Особое внимание уделено влиянию влажности на уплотняемость различных типов грунтов. Установлено, что избыточная влага снижает несущую способность и вызывает деформации дорожной конструкции. Предложены меры по повышению устойчивости земляного полотна, включая применение химических стабилизаторов и организацию эффективного дренажа (открытые, закрытые, вертикальные и поперечные дренажи, геосинтетические материалы). Представлены схемы и графики, отражающие сезонные процессы в теле насыпи. Полученные результаты могут быть использованы при проектировании и эксплуатации автомобильных дорог в регионах с повышенным уровнем грунтовых вод и неблагоприятными климатическими условиями.*

Ключевые слова: *Земляное полотно, устойчивость, климатические факторы, гидрогеология, грунтовые воды, промерзание, капиллярное поднятие влаги, влажность грунта, уплотнение, дренаж, стабилизация грунтов, пучинистость, лессовидные грунты, тепловой поток, атмосферные осадки, фильтрация, инфильтрация, геосинтетические материалы, дорожное покрытие, несущая способность. ANT, AKROPOL, NICKOFLOCK, Nano STAB, цемент, известь, соли, ПАВ, полимеры.*

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IMPACT OF CLIMATIC AND HYDROGEOLOGICAL FACTORS ON THE STABILITY OF HIGHWAY EMBANKMENTS IN UZBEKISTAN

Abstract: *This study examines the influence of climatic and hydrogeological conditions on the stability of the roadbed structures of highways in Uzbekistan. It analyzes temperature gradients in soils, the depth of frost penetration, and the mechanisms of subgrade moisture accumulation due to atmospheric precipitation, capillary rise, and groundwater. Special attention is given to the effect of soil moisture on the compaction of various soil types. It is established that excessive moisture reduces the bearing capacity and leads to deformation of the road structure. Measures to improve roadbed stability are proposed, including the use of chemical stabilizers and the implementation of effective drainage systems (open, closed, vertical, and transverse drains, as well as geosynthetic materials). Diagrams and graphs illustrating seasonal processes within the embankment body are presented. The obtained results can be applied in the design and maintenance of highways in regions with high groundwater levels and adverse climatic conditions.*

Keywords: *Roadbed, stability, climatic factors, hydrogeology, groundwater, frost penetration, capillary rise of moisture, soil moisture, compaction, drainage, soil stabilization, frost heaving, loess-like soils, heat flow, atmospheric precipitation, filtration, infiltration, geosynthetic materials, pavement, bearing capacity, ANT, AKROPOL, NICKOFLOCK, Nano STAB, cement, lime, salts, surfactants, polymers.*

Годовой ход температуры грунтов разделяется на 2 периода: нарастания температуры и ее снижения. Летом тепловой поток направлен вниз и к обочинам, и наиболее высокая температура грунтов наблюдается под покрытием. Осенью на непродолжительный период наступает осеннее температурное равновесие. В это время начинается изменение направления температурных градиентов, и тепловой поток направлен снизу вверх. Перед началом промерзания грунта земляного полотна температура грунтов под обочинами немного выше, чем под покрытием, и тепловой поток направлен от обочины к покрытию. Такое состояние грунта сохраняется до конца зимы. К этому времени до начала оттаивания грунтов происходит изменение направления теплового потока. Если сравнить ход температуры грунтов под дорожной одеждой, на обочине и обрезе, то окажется, что температура грунта на обрезе в зимний период значительно выше, чем под семью, а температура грунтов обреза и обочин почти одинакова. Следовательно, в земляном полотне, кроме вертикальных температурных градиентов грунт – воздух, имеются и горизонтальные градиенты: грунты обочин – грунты под покрытием. Это обстоятельство имеет большое значение для зимнего перераспределения влаги.

Температура грунта более устойчива, чем температура воздуха, и эта устойчивость повышается с глубиной. Наступление отрицательной

температуры в грунте по сравнению с воздухом сильно запаздывает. Глубина проникновения температуры 0 °С и зависит от его влажности, механического состава, содержания растворов солей и т.д. Поэтому глубина промерзания грунтов меньше, чем глубина проникновения нулевой температуры. Сильное влияние на глубину промерзания грунта оказывает снежной покров. В Беларуси в малоснежные – только 20 см [1-5].

Для верхней части земляного полотна дороги грунты (глинистые грунты) должны классифицироваться по составу, способности к уплотнению, относительной осадке и склонности к морозному пучению, а также просадочности при оттаивании — в соответствии с таблицей 12 приложения 2 настоящего ШНҚ 2.05.02-23 [2-3].

Таблица-1. **Предельно допустимая влажность при уплотнении грунта**

Грунты	Требуемый коэффициент уплотнения грунта			
	Больше 1,0	1,0-0,98	0,95	0,90
Пылеватые пески, лёгкие и крупные супеси	0,90-1,30	0,80-1,35	0,75-1,60	0,70-1,60
Пылеватые и лёгкие супеси	0,90-1,20	0,80-1,25	0,75-1,35	0,70-1,60
Тяжёлые пылеватые супеси, Лёгкие и пылеватые лёгкие суглинки	0,90-1,10	0,83-1,15	0,80-1,30	0,75-1,50
Тяжёлые суглинки, Пылеватые тяжёлые глины	0,90-1,00	0,90-1,05	0,85-1,20	0,80-1,30
Пылевато-лёссовые супеси	0,90-1,20	0,80-1,25	0,75-1,35	0,70-1,50
Пылеватые и тяжёлые лессовидные супеси, Пылеватые лёгкие суглинки	0,90-1,10	0,85-1,20	0,85-1,25	0,70-1,40
Пылеватые тяжёлые лессовидные суглинки, Пылеватые глины	0,90-1,00	0,90-1,20	0,85-1,20	0,75-1,30

Примечания:

1. Летом при возведении насыпей из песков без пылеватых частиц допустимая влажность не ограничивается.

2. Данные ограничения не распространяются на насыпи, возводимые гидр намывом (с использованием воды).

3. Зимой при возведении насыпей влага в грунте не допускается. Для лессовидных грунтов, песчаных и не пылеватых супесей влажность не должна превышать 1,3 W_0, для пылеватых супесей и лёгких суглинков — 1,2 W_0, для остальных видов грунтов — не более 1,1 W_0.

4. Допустимая влажность грунтов может быть определена с учётом технологических возможностей используемых уплотняющих средств.

Одним из факторов, влияющих на устойчивость и прочность земляного полотна, является увлажнение его поверхностными водами. Выпадающие на поверхность земляного полотна атмосферные осадки расходуются на сток, просачивание в грунт (инфильтрация) и испарение. Возможность и

интенсивность поступления влаги в грунт определяются его водопроницаемостью. Водопроницаемость грунта зависит от первоначальной влажности грунта, механического и химического состава. Чем меньше его первоначальная влажность, тем выше водопроницаемость. Водопроницаемость крупнообломочных, крупно- и среднезернистых песков почти полностью зависит от механического состава и пористости, так как размерами частиц и плотностью этих грунтов определяется пористость. Для глинистых грунтов существенное влияние на водопроницаемость оказывает наличие тонкодисперсных систем и коллоидов. Характеристикой скорости впитывания, влаги грунтом является коэффициентов впитывания, или поглощения. Процесс впитывания воды в грунт является сложным явлениям,

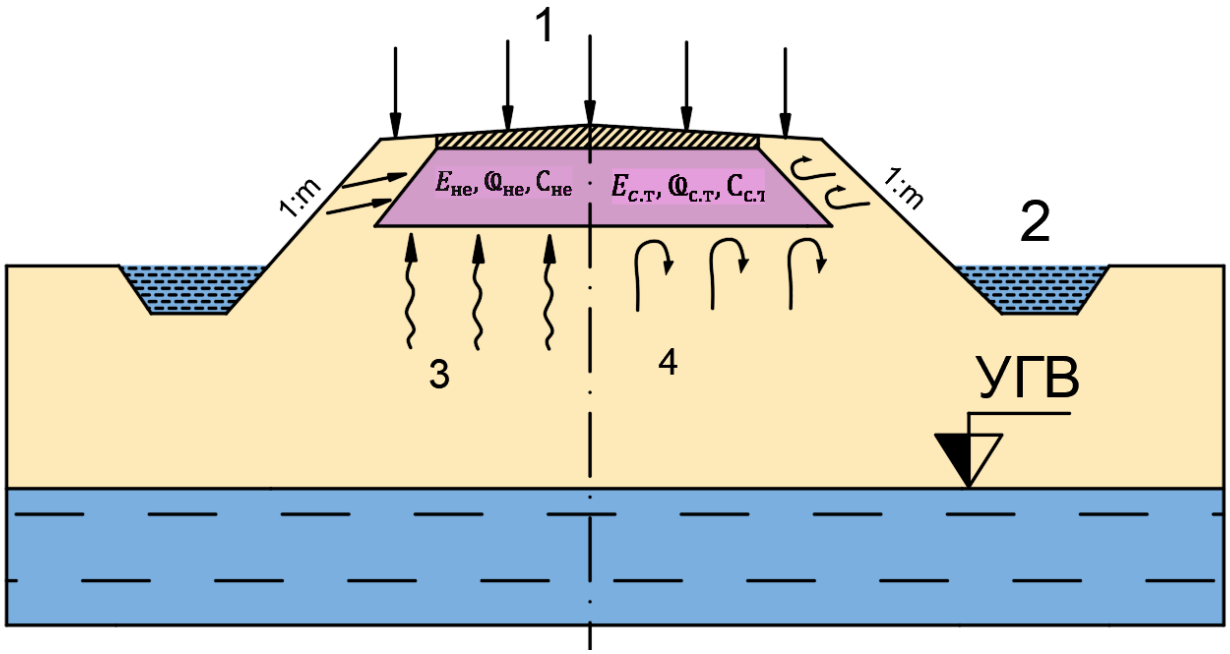

Рис.1. **Режим земляного полотна** водно-тепловой. Источники увлажнения грунтов земляного полотна: 1 – атмосферные осадки; 2 – поверхностная вода; 3 – капиллярная вода от грунтовых вод; 4 – капиллярный подъём воды из грунтовых вод; 5 – не стабилизированный слой; 6 – Стабилизированный слой

при этом различают явления поглощения (впитывания) воды и фильтрации. Фильтрация начинается лишь при полном насыщении грунта водой. Характеристикой фильтрации является коэффициент фильтрации, а впитывания – коэффициент поглощения. Инфильтрация воды в грунт представляет собой довольно сложный процесс, который ещё слабо изучен, а теория его расчёта разработана недостаточно. Физический смысл инфильтрации заключается в том, что нисходящее движение воды в грунтах происходит под действием гравитационных и молекулярных сил, а также сил, обусловленных трением, вязкостью жидкости и наличием защемленного воздуха в порах грунта (Рис.1).

Режим снежный – установленные для определенного региона данные о частоте, продолжительности и объёме снегопадов, об образовании снежного покрова и его высоте, снегозаносах, а также свойствах снега. Важно учитывать при планировании мероприятий по зимнему *содержанию дорог* (Рис.1-4).

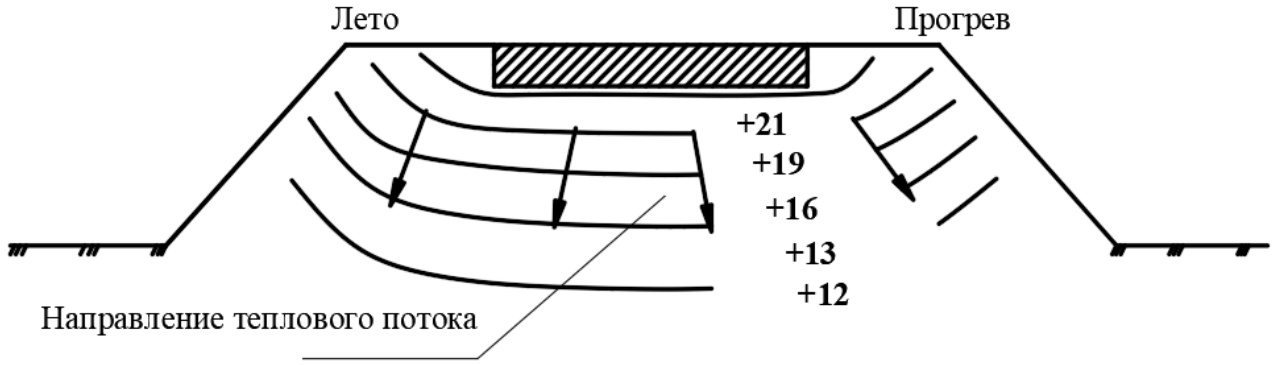

Рис.2. Направление теплового потока в летом.

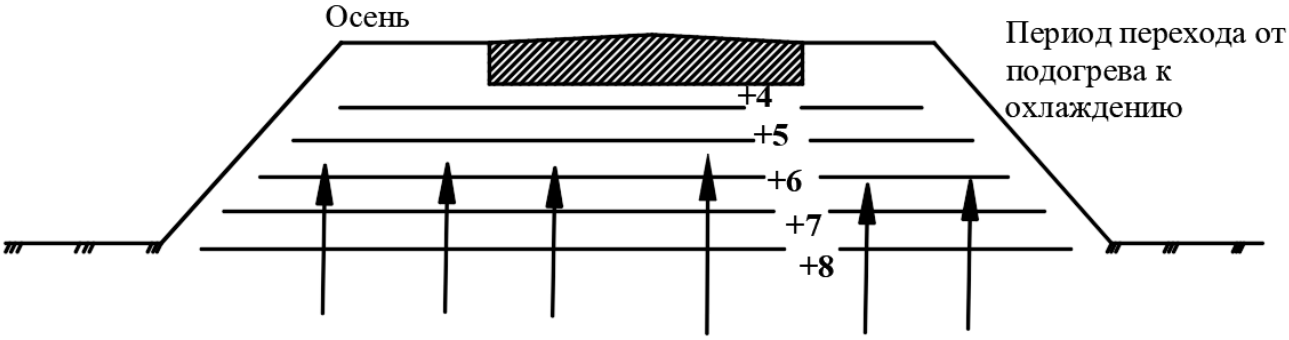

Рис.3. Период перехода от подогрева к охдаждению в осенью.

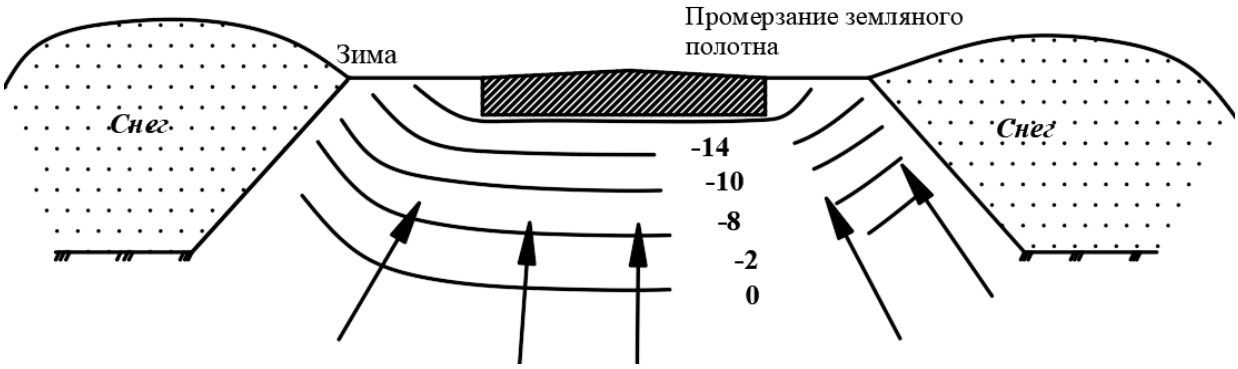

Рис.4. Промерзание землного полотна в зимой

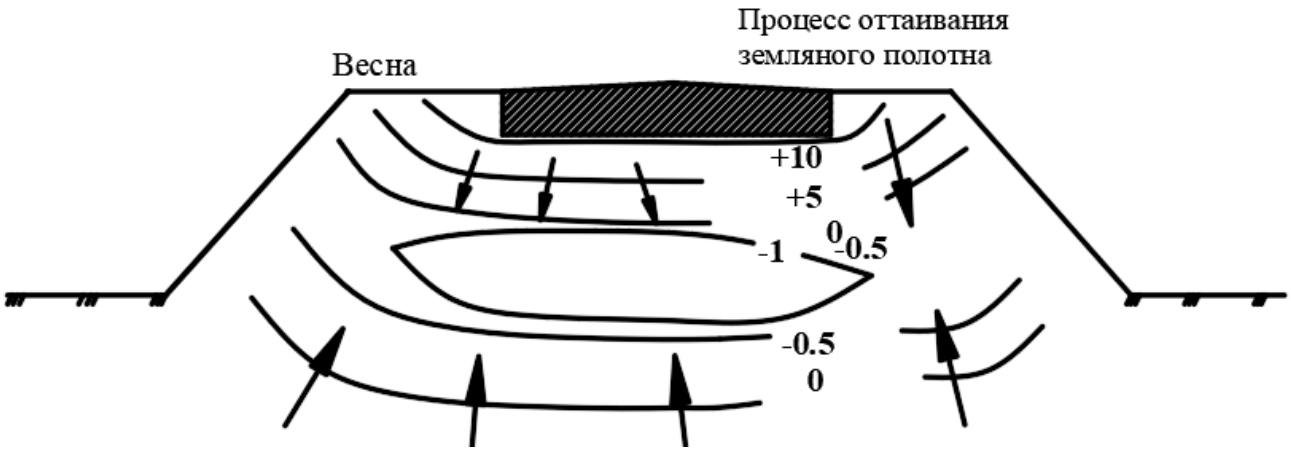

Рис.5. Процесс оттаивания земляного полотна

Грунтовые воды — один из главных врагов земляного полотна и покрытия.

Избыточная влага снижает несущую способность основания и приводит к деформациям и разрушениям.

При уплотнении грунта уровень грунтовых вод может подняться, особенно в весенне-осенний сезон — это наблюдаемое явление (Рис.5).

Использование стабилизаторов и химических добавок (например, **цемент, известь, соли, ПАВ, полимеры**) — действительно эффективный метод для повышения водоустойчивости и прочности грунта. Есть **ещё** другие модификаторы такие как: “ANT”, “AKROPOL”, “NICKOFLOCK”, “Nano STAB”.

Чтобы организовать дренаж для отвода влаги» или *«снизить капиллярный подъем воды» с помощью фильтрующих или водоотводящих слоев есть новая идея [4-5]:*

Грунтовые воды представляют собой одну из основных угроз для устойчивости земляного полотна и дорожного покрытия. Особенно в период весеннего подъёма уровня вод уплотнение грунта может сопровождаться капиллярным поднятием влаги. Для предотвращения этого явления целесообразно использовать стабилизацию грунта с применением химических добавок, которые связывают влагу и повышают несущую способность основания. Дополнительно необходимо предусматривать дренажные системы, обеспечивающие отвод воды и снижение уровня грунтовых вод в зоне дорожной конструкции.

Рис.7. Продольные дренажные канавы (открытые канавы):

Продольные дренажные канавы (открытые канавы):

- Располагаются вдоль насыпи или выемки дороги.
- Собирают поверхностные и грунтовые воды.
- Удобны в сухом климате, легко очищаются [6].

Применимо в Узбекистане на участках с неглубокими грунтовыми водами (Рис.7.).

Рис.8. Закрытые дренажные трубы (перфорированные)

Закрытые дренажные трубы (перфорированные):

- Укладываются вдоль или поперёк дороги в специальных траншеях с фильтрующей обсыпкой (гравий + геотекстиль).
- Эффективно понижают уровень грунтовых вод [7].

Хорошо работают при капиллярном поднятии влаги, особенно в весенний период (Рис.8).

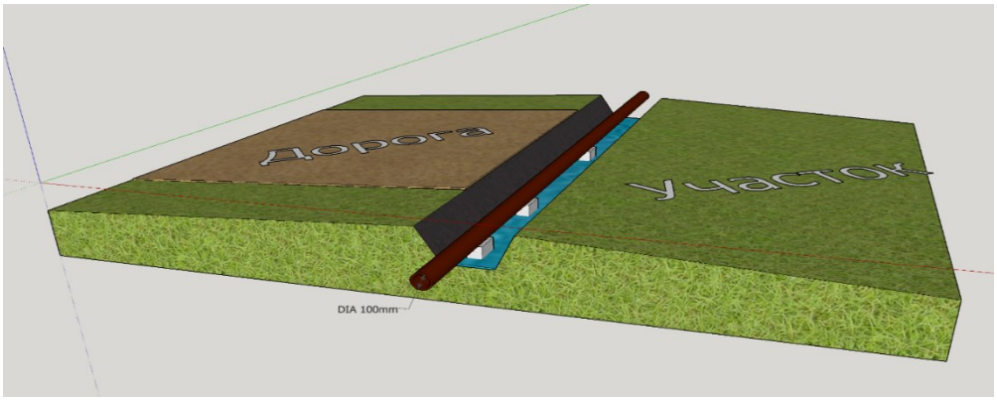

Рис.9. Поперечные дренажи

Поперечные дренажи:

- Устраиваются в теле насыпи или под покрытием, отводят воду через дорогу в сторону.
- Часто совмещаются с трубчатыми водопропускными сооружениями [8] (Рис.9).

Рис.10. Вертикальные дренажи (вод понижающие скважины)

Вертикальные дренажи (водопонижающие скважины):

- Бурятся вблизи дороги, вода откачивается насосами.

• Применяются при высоком уровне грунтовых вод и малой фильтрации почв [9]. *Менее распространены, но эффективны на сложных участках (например, вблизи водоёмов) (Рис.10).*

Рис.11. Геосинтетические дренажные маты и прокладки

Геосинтетические дренажные маты и прокладки:

• Укладываются под покрытие или в основание насыпи.

• Ускоряют водоотвод и предотвращают капиллярное поднятие [10] (Рис.11).

Заключение

В ходе выполненного проекта было рассмотрено одно из ключевых воздействий на земляное полотно — влияние грунтовых вод. Установлено, что капиллярное поднятие влаги в весенне-осенний период способно существенно снизить несущую способность основания и ускорить разрушение дорожной конструкции. Для повышения устойчивости земляного полотна предложено использовать стабилизацию грунта с применением химических добавок, а также предусмотреть эффективные дренажные решения.

Разработанная схема поперечного профиля показывает распределение нагрузок, направление влаг накопления и конструктивные элементы, препятствующие поднятию влаги в зону дорожной одежды. Реализация таких инженерных решений позволит обеспечить долговечность, устойчивость и безопасность автомобильных дорог, особенно в условиях повышенного уровня грунтовых вод.

Полученные знания и предложенные мероприятия могут быть эффективно применены при проектировании и строительстве автомобильных дорог в регионах с неблагоприятными гидрогеологическими условиями.

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ВОЗРАСТНОЕ РАЗВИТИЕ ПОЯСНИЧНЫХ СИМПАТИЧЕСКИХ УЗЛОВ У КРОЛИКОВ

Резюме: *В статье изучены возрастное развитие поясничных симпатических узлов у кроликов. Использованы макроскопические и микроскопические методы исследования. Наши материал позволил установить некоторые закономерности между дифференцировкой нейронов поясничных симпатических узлов и важными физиологическими изменениями в организме*

Ключевые слова: *кролик, симпатическое узлы, методы по Бильшовскому-Грос, Кампос, окраска по Нисслю, поясничных узлов, нейробласта.*

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AGE-RELATED DEVELOPMENT OF LUMBAR SYMPATHETIC GLANDS IN RABBITS

Abstract: *The article studies the age-related development of lumbar sympathetic ganglia in rabbits. Macroscopic and microscopic methods of research are used. Our material allowed us to establish some patterns between the differentiation of neurons of the lumbar sympathetic ganglia and important physiological changes in the body*

Keywords: *rabbit, sympathetic ganglia, methods according to Bilshovsky-Gross, Campos, Nissl staining, lumbar ganglia, neuroblast.*

Ввдение. За последние два десятилетия значительно возрос интерес к особенностям строения органов и систем в процессе их роста [1,2]. Однако, с этой точки зрения не все системы изучаются в одинаковой степени. В литературе имеются лишь некоторые данные по вопросу возрастных изменений в строении узлов вегетативной нервной системы, хотя в связи с развитием новой отрасли медицины геронтологии этот вопрос приобретает особую актуальность [4,3]. По морфологии поясничных симпатических узлов лабораторных животных имеется единичные работы [5]. Специальных

исследований, посвященных возрастным особенностям поясничных симпатических узлов у кроликов, мы в доступной литературе не нашли.

Цель исследования. Изучить возрастное развитие поясничных симпатических узлов у кроликов.

Материалы и методы исследования. Задачей настоящего исследования является установление закономерностей в развитии поясничных симпатических узлов у кроликов, для чего использованы макроскопические и микроскопические методы исследования (макро-микроскопический способ препарирования по Воробьеву-Синельникову, импрегнация срезов поясничных узлов по Бильшовскому-Грос, Кампос, окраска по Нисслю). Измерения стволов и узлов на макроскопических препаратах проведены при помощи штангенциркуля. На плодах измерения сделаны с помощью микроскопа МБС-2. Измерения нейронов и их ядер проведено при помощи окулярной микросетки на препаратах, окрашенных по Нисслю. Учитывая общепризнанную вариабильность биологических объектов, для объективного анализа динамических рядов изучаемого материала, цифровые данные обработаны методом.

Результаты исследования. Наши исследования, показали, что поясничная часть пограничного симпатического ствола кроликов, проникая из грудной полости в брюшную между латеральной и срединной ножками диафрагмы, располагается под медиальными краями поясничных мышц на вентрально-латеральной поверхности поясничных позвонков. Количество узлов в поясничной части симпатического ствола колеблется от 3 до 7. У плодов, как правило, имеется 5 узлов, у новорожденных - 5-6 узлов, у взрослых кроликов - до 7 узлов, что, по-видимому, свидетельствует о закономерном нарастании количества узлов в онтогенезе. Длина поясничных симпатических узлов у плодов кролики колеблется в пределах от 0,97 0,39 до 4,100,78 мм. у новорожденных - от 2,33 0,17 до 5,70 2,30 мм. В возрасте 2-5 лет и старше длина узлов достигает 18,08 1,86 мм. Учитывая, что графический показ динамических рядов облегчает выявление определенных закономерностей, нами на линейных размерах (длина) узлов построены графики, отражающие показатели развития отдельных узлов в возрастном аспекте. Кривые показателей длины правых и левых поясничных симпатических узлов в динамике их развития показали в основном единый их характер с некоторым превалированием кривой левых узлов. Последнее особенно выражено в первых и вторых узлах в возрасте 1-2 лет. В левых четвертом и шестом узлах пик кривой. падает на возраст от 6 мес. до 1 года, а в левом пятом поясничном узле наиболее выражен в раннем постнатальном периоде. Анализ кривых позволил отметить в развитии поясничных узлов некоторые закономерности: 1) от начала постнатального развития до 6 месяцев наблюдается постепенный и равномерный рост узлов в длину; 2) быстрый рост характерен для периода от 6 мес. до 1 года. Эту закономерность можно, по-видимому, объяснить более бурным процессом развития внутренних органов, в том числе эндокринных и половых, вследствие чего

нарастает и функциональная активность поясничных узлов; 3) последующие стадии развития в общем характеризуются стабилизацией роста, узлов и незначительными изменениями, характерными для половозрелого организма. Пик подъема кривой падает на возраст от 1 до 2-х лет. Это, вероятно, находится в прямой связи с половозрелостью животных, когда функции внутренних органов и систем - параллельно с завершением развития нейрогуморальных механизмов проявляются наиболее активно. Определенный интерес приобретают коррелятивные между показателями длины и ширины поясничных узлов. Коррелятивные связи между показателями длины и ширины в онтогенезе во всех узлах и возрастных группах положительны с высоким уровнем вероятности. Исключение составляют правые поясничные узлы, где коэффициент корреляции [+0,841 0,15], хотя и достаточно высок, но все же несколько ниже уровня статистической достоверности. Для характеристики динамики развития поясничных симпатических узлов известный интерес представляет процентное отношение размеров этих узлов у плодов, новорожденных, прозревших и молодых растущих животных по отношению к размерам узлов у половозрелых животных, принятых условно за 100%. На основании этих данных нами отмечены следующие закономерности: 1) во всех случаях наблюдается прогрессивный рост показателей линейных размеров от эмбрионального периода до половозрелого состояния. Однако в ряде узлов наблюдается некоторое отклонение от общей закономерности, что, по-видимому, объясняется индивидуальными особенностями животных и другими факторами, не поддающимися объяснению; 2) обращает на себя внимание резкое увеличение размеров узлов у животных 1-6 месячного возраста, что, по-видимому, связано с такими важными физиологическими изменениями в организме животного, как переход на самостоятельное питание, половое созревание, а вместе с ними и повышение функциональной активности эндокринных органов. Нами также прослежено развитие нервных клеток поясничных симпатических узлов кроликов, начиная от пре - специфического периода развития (стадия пронейробласта), специфического (юные и мультиполярные формы нейробласта) до инволютивного периода включительно. Начиная с 2-5-летнего возраста, микрометрические показатели заметно уменьшаются. Это положение подтверждается и расчетами коррелятивных связей между диаметром нейронов и их ядер. Коэффициент корреляции составляет + 0,967 + 0,02 с уровнем вероятности - > 99%. Наибольших размеров узлы, нейроны и их ядра достигают в возрасте 1-2 лет (размеры их соответственно составляют 18,080,86 мм; 35,5 0,98; 13,20,3 мк).

Вывод. Таким образом, наш материал позволил установить некоторые закономерности между дифференцировкой нейронов поясничных симпатических узлов и важными физиологическими изменениями в организме (прозревшие, переход на самостоятельное питание, половое созревание).

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ОТДАЛЕННЫЕ РЕЗУЛЬТАТЫ ХИРУРГИЧЕСКОГО ЛЕЧЕНИЯ ХРОНИЧЕСКОГО ТОНЗИЛЛИТА У ДЕТЕЙ, СТРАДАЮЩИХ РЕВМАТИЗМОМ

Резюме: *В статье изучены отдаленные результаты хирургического лечения хронического тонзиллита у детей, страдающих ревматизмом. Под нашим наблюдением в течение 6 лет находилось 386 детей, больных ревматизмом. Эти больные были разделены на три группы: в первую включены 145 человек, страдавших ревматизмом и хроническим тонзиллитом, которым последние несколько лет по поводу хронического тонзиллита проводилось консервативное лечение. Рецидивы ангин и паратонзилярных воспалений после тонзилэктомии прекратились в 97% наблюдений.*

Ключевые слова: *дети, хронический тонзиллит, страдающих ревматизмом, ревматический мио-кардиосклероз, тонзилэктомия.*

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LATE RESULTS OF SURGICAL TREATMENT OF CHRONIC TONSILLITIS IN CHILDREN WITH RHEUMATISM

Abstract: *The article studies the late results of surgical treatment of chronic tonsillitis in children with rheumatism. We observed 386 children with rheumatism for 6 years. These patients were divided into three groups: the first included 145 people suffering from rheumatism and chronic tonsillitis, who had been undergoing conservative treatment for chronic tonsillitis for the past few years. Recurrences of tonsillitis and paratonsillar inflammation after tonsillectomy ceased in 97% of cases.*

Keywords: *children, chronic tonsillitis, rheumatism, rheumatic myocardial sclerosis, tonsillectomy.*

Ввдение. Изучению отдаленных результатов хирургического лечения хронического тонзиллита у больных, страдающих ревматизмом, посвящена обширная литература [3,4]. Об эффективности этого лечения как в отечественной, так и зарубежной литературе приводятся различные данные

[1,2]. В ряда исследователей результаты лечения ревматизма были лучше в тех случаях, когда тонзилэктомию осуществляли по возможности в ранней стадии ревматизма и в молодом возрасте [5,6]. При оценке результатов хирургического лечения хронического тонзиллита у больных, страдающих ревматизмом, рекомендуют руководствоваться состоянием сердечно-сосудистой системы, наличием рецидивов ревматизма и повторных атак, формированием порока, прогрессированием сердечной патологии [7]. Все приведенное выше побудило нас заняться изучением отдаленных результатов хирургического лечения хронического тонзиллита у детей, страдающих ревматизмом.

Цель исследования. Нами были изучено отдаленные результаты хирургического лечения хронического тонзиллита у детей, страдающих ревматизмом.

Материалы и методы исследования. Под нашим наблюдением в течение 6 лет находилось 386 детей, больных ревматизмом, в возрасте от 6 до 14 лет. Из них девочек было 118, мальчиков-128 человек, жителей городов - 140, сел и деревень - 146. Ревматический миокардиосклероз был диагностирован у 253 больных, порок сердца (в подавляющем большинстве случаев - недостаточность митрального клапана) -у 33 человек.

Результаты исследования. При осмотре ЛОР-органов хронический тонзиллит выявлен у 246 больных, патологии со стороны ЛОР-органов не определялось у 140 человек. Хронический тонзиллит значительно чаще диагностирован среди жителей городов (69,1%), чем жителей сел и деревень (54,8%). Мальчики и девочки болели хроническим тонзиллитом одинаково часто.При наблюдении за течением ревматического процесса в отдаленные сроки больные были разделены на три группы. К первой группе отнесены 145 больных ревматизмом и хроническим тонзиллитом, которым последние несколько лет по поводу хронического тонзиллита проводилось консервативное лечение. Больным второй группы (101 человек) в различные сроки от начала заболевания ревматизмом и хроническим тонзиллитом произведена тонзиллэктомия. Третья группа - контрольная: это больные, страдающие только ревматизмом (140 человек).

Тонзилэктомия произведена на первом году заболевания ревматизмом 16 больных, через два года - 27, на третьем году - 22, на четвертом - 7, на пятом - 4, на шестом -7. Остальным 4 больным удаление миндалин произведено на 8-9 году заболевания. Следует отметить, что из пациентов второй группы 6 человек начала заболевания ревматизмом не знали, а 8 больных оперированы по поводу хронического тонзиллита за 1 год до выявления ревматизма. Повторные атаки у больных первой группы зарегистрированы в 6,2% случаев; у больных второй группы, подвергнутых тонзилэктомии, повторные атаки ревматизма выявлялись значительно реже, всего-в 3,9% случаев и только преимущественно у тех больных, которым операция произведена позднее 5 лет от начала возникновения болезни.

Формирование пороков сердца в послеоперационном периоде у больных второй группы не отмечено. У больных третьей группы повторные атаки ревматизма диагностированы в 2,1% случаев.

Следует отметить, что после тонзилэктомии рецидивы ангин и паратонзилярных воспалений прекратились в 97% случаев. Наилучший результат лечения ревматизма наблюдался у больных, которым операция произведена в течение первых двух лет от начала заболевания.

Отдаленные результаты хирургического лечения хронического тонзиллита у детей, страдающих ревматизмом, по нашему мнению, следует изучать совместно с педиатром и с учетом состояния сердечно-сосудистой системы.

Вывод. В течение 6 лет под наблюдением находилось 386 детей больных ревматизмом в возрасте от 6 до 14 лет. Эти больные были разделены на три группы: в первую включены 145 человек, страдавших ревматизмом и хроническим тонзиллитом, которым последние несколько лет по поводу хронического тонзиллита проводилось консервативное лечение; больным второй группы (101 человек) в различные сроки от начала заболевания ревматизмом и хроническим тонзиллитом произведена тонзилэктомия. Третья группа - контрольная; это больные, страдающие только ревматизмом (140 человек). Повторные атаки ревматизма у больных первой группы за регистрированы в 6,2%, во второй - в 3,9%, в третьей - в 2 1% случаев. Рецидивы ангин и паратонзилярных воспалений после тонзилэктомии прекратились в 97% наблюдений.

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СОДЕРЖАНИЕ И СУТЬ ПОНЯТИЯ ИННОВАЦИОННОЕ МЫШЛЕНИЕ

Аннотация. *В статье рассматривается сущность понятия инновационного мышления, его определения, значение инновационного мышления для жизни человека, его положительные и отрицательные стороны, роль средств массовой информации в жизни современной молодежи и их значение в духовно-нравственном воспитании подрастающего поколения.*

Ключевые слова: *мышление, инновационное мышление, социальные сети, массовая культура, информационное общество, идеологический иммунитет, этика.*

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THE CONTENT AND ESSENCE OF THE CONCEPT OF INNOVATIVE THINKING

Annotation. *The article examines the essence of the concept of innovative thinking, its definitions, the importance of innovative thinking for human life, its positive and negative sides, the role of mass media in the life of modern youth and their importance in the spiritual and moral education of the younger generation.*

Keywords: *thinking, innovative thinking, social networks, mass culture, information society, ideological immunity, ethics.*

В настоящее время внедрение инновационной экономики остается одним из важнейших факторов обеспечения устойчивого развития нашей страны, укрепления ее конкурентоспособности и повышения благосостояния населения. Человеческое сознание, интеллект и восприятие не удовлетворены существующими подходами, определениями и стереотипами, они хотят их изменить и обновить. Поиск новизны, стремление к новым идеям схожи с познавательной природой человека, гносеологическими потребностями.

Поэтому инновации являются прежде всего продуктом внутренних, духовных и гносеологических потребностей человека.

Инновационное мышление основано на стремлении изменить окружающую среду, обновить общественную жизнь на рациональной основе. Стремление к новизне в человеческом сознании и восприятии, потребность в инновациях, приобретает инновационную сущность, когда строится на рациональной основе. Поэтому инновационное мышление — это рационально обоснованная субъективная деятельность, направленная на изменение и обновление окружающей среды. Инновационное мышление — это способность находить оригинальные решения новых или уже изученных проблем, создавать и улучшать мир вокруг себя. Вы можете придумать, как оптимизировать процессы в отделе или изобрести лекарство от смертельной болезни. И то, и другое — продукты инновационного мышления.

А.П. Усольцев и Т.Н. Шамало определили понятие инновационного мышления и обратили внимание на его специфические черты и структуру [16]. В то же время ряд исследователей проводят сравнительный анализ понятия «инновационное мышление» со схожими понятиями мышления, его особенностями, схожими и различными характеристиками, такими как креативность [5], научное мышление [11], творческое мышление [14; 17] и т.д.

По мнению С.В. Сокериной, «инновационное мышление может функционировать только в условиях, обеспечивающих реализацию этих компонентов, достижение функциональной цели» [13]. В результате проведенного ею научного анализа были выделены следующие компоненты, составляющие определение понятия «инновационное мышление»: целеполагающий, инициативный, смысловой, процессуальный, познавательный, содержательный, эмоциональный, социально-детерминирующий и личностный.

В научной статье Ш. Турсуновой отмечается, что инновационное мышление – это вид творческой и практической деятельности, связанный с субъективной деятельностью человеческого сознания, интеллекта, восприятия, воображения. Выявлено, что данный вид деятельности основан на рациональности, потребностях и требованиях общества [15].

Профессор Т.Т. Мадумаров проанализировал приоритетные направления совершенствования инновационного мышления молодежи в Узбекистане [10], Ш.Т. Кубаева в своем научном исследовании сосредоточилась на онтологическом и гносеологическом анализе инновационного мышления [9].

Научный сотрудник Х.И. Абдурахмонов проанализировал процессы формирования инновационного мышления в нашем обществе и его значение. Он изучил требования к формированию инновационного мышления, роль творческого мышления в этом, важность теоретических знаний и неспособность человеческого мозга формировать инновационное мышление с помощью логики и планирования. Он также выявил несколько барьеров инноваций и внес предложения по их устранению [2].

Некоторые исследователи утверждают, что инновационное мышление – это нестандартное мышление [12], которое тесно связано с изучаемыми типами мышления. Этот тезис, подтвержденный М.Н. Жаворонковой, выделяет семь ключевых навыков инновационного мышления, которые необходимо развивать: системное, «многоэкранное» мышление вместо узконаправленного мышления; абстрактное мышление в поисках решений вместо специализированного мышления; функционально-ориентированное мышление вместо объектно-ориентированного мышления; долгосрочное мышление вместо краткосрочного мышления; аналитическое мышление вместо скачкообразного; структурированное мышление вместо хаотического мышления; умение видеть проблему вместо поиска привычных решений [7].

С.В. Сокерина считает, что в процессе изучения определения «инновационное мышление» необходимо изучать его через призму девяти компонентов, которые позволяют подробно рассмотреть его особенности [13]. Она также попыталась расшифровать компоненты определения «Инновационное мышление». В частности, по компоненту целеполагания (Н.М. Вострикова, А.П. Усольцев, Е.В. Батоврина), «инновационную деятельность можно рассматривать как целенаправленную деятельность, направленную сначала на создание мысленной модели, а затем на осуществление предметной деятельности по внедрению этой модели на практике [6; 16; 4]. Инновационное мышление направлено на достижение результата [4]. Безусловно, мышление новатора направлено на изменение состояния объекта, о котором он думает, желая его улучшить или усовершенствовать.

Согласно инициирующему компоненту (Г.М. Коджаспирова, Г.А. Токарева и др.), новатором движет внутренняя сила, включающая и сопровождающая инновационное мышление. Это может быть внутренняя мотивация, основанная на реализации внутренних потребностей. Одним из инициирующих факторов может быть интуиция, привлекающая новатора [8], а также сформированное «инновационное сознание», которое характеризуется следующими параметрами: а) преобладание ориентации на инновационную деятельность над стандартной; б) наличие оценки (или шкалы) инновационности; в) устойчивая (но не чрезмерная) мотивация; г) инновационные потребности; г) инновационные планы [14].

Инновационное мышление — это способность генерировать новые идеи и подходы к решению проблем, а также креативное мышление, которое позволяет выходить за рамки стандартных решений и находить нестандартные решения. Инновационное мышление включает в себя не только способность видеть проблему, но и способность искать новые пути ее решения, а также способность реализовывать эти решения на практике.

Инновационное мышление — это довольно широкое понятие, в нашем обществе существуют различные подходы к нему. Стоит сказать, что не будет ошибкой называть так достижения науки и техники сегодняшнего дня и их передовые практики. Каждую секунду человечество думает о какой-то

технике или технологии для улучшения жизни людей в эту современную эпоху.

Япония, страна, продвинувшаяся в науке и технике, в настоящее время работает над искусственным интеллектом, особенно японские ученые, которые работают в рамках своего собственного мышления, то есть своего интеллекта. Ведь они продвигаются с той разницей, что в их мышлении есть понятие информации для проектирования искусственного интеллекта. Мышление — это высокая форма интеллектуальной деятельности человека, отражающая объективную реальность в человеческом сознании, которое, как говорят, является суммой его общих представлений о бытии.

Прежде чем начать говорить о проблеме инновационного мышления, мы посчитали необходимым упомянуть выступления нашего главы государства. Подчеркивая дальнейшее совершенствование системы образования нашей страны, развитие работы в области внедрения новых, современных методов обучения, в том числе педагогических и информационно-коммуникационных технологий, он говорит: «Мы все прекрасно знаем, что сегодня — эпоха высоких технологий и инноваций» [1]. Действительно, инновационное мышление требует от сегодняшней молодежи острого ума и навыков. Одно дело — иметь знания о каждой методике, а другое — применять к ней дополнительные знания и перепроектировать ее, что зависит от этого мыслящего ума.

Наш всеобъемлющий ответ на вопрос о том, что такое инновационное мышление в процессе глобализации, заключается в том, что можно сказать, что, прежде всего, это целостная система навыков и общий набор понятий, которые являются общими для всех народов мира сегодня, от новых научно-технических достижений до использования всех созданных технологий.

Сегодня человечество как никогда поддерживает разработку новых инновационных технологий, что можно назвать проявлением необходимости.

Как сказал Н.А. Бердяев, «для того, чтобы мир был понят, необходимо создать соответствующую потребность в человеческом мышлении» [3]. То есть, в процессе глобализации сегодня человечество испытывает потребность или необходимость в инновационных технологиях, в какой области или секторе, в частности, медицине, образовании, промышленности, управлении, обороне и т.д., для всех них новая технология означает новую возможность.

Таким образом, инновационное мышление базируется на определенных личностных характеристиках, а новатор, имея определенную цель инновационной деятельности и отталкиваясь от внутренних сообщений, осуществляет мыслительный процесс путем понимания и поиска нового смысла, развития имеющихся знаний и осуществления определенных действий и процессов, в которых также реализуется и развивается инновационное мышление. При этом мыслительный процесс сопровождается определенным эмоциональным фоном и средовой поддержкой, которые являются дополнительными катализаторами инновационной мыслительной деятельности.

Сегодня, когда мы говорим о концепции использования инновационных технологий в образовательных учреждениях нашей страны, первое, что приходит на ум учителям и воспитателям, это электронные доски. Прежде всего, не будем забывать, что если учителя не знают инновационные технологии и не умеют ими пользоваться, то нет смысла обучать молодежь современным технологиям. Можно сказать, что если мы изменим или дополним нашу структуру мышления, которая заключается в умении использовать все инновационные технологии, то наша структура мышления будет более эффективной и полезной. По мере развития общества развиваются и его технологии, но если бы 1 из 10 человек в нашем обществе думал о внедрении в него инноваций, а не об использовании технологий, которые явно предназначены для служения интересам человечества, то инновационное мышление было бы в этом обществе гораздо более развито.

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ФИЛОСОФИЯ ДУШИ И ОБЩЕСТВА: УНИКАЛЬНОСТЬ РУССКОГО РЕАЛИЗМА XIX ВЕКА

Аннотация: *В данной статье исследуются ключевые черты русского реализма XIX века сквозь призму философских концепций души и общества. Особое внимание уделяется анализу произведений выдающихся писателей этого периода — Ф. М. Достоевского, Л. Н. Толстого, И. С. Тургенева, А. П. Чехова и И. А. Гончарова. Рассматривается, как авторы художественно осмысляли внутренний мир своих героев, их нравственные поиски, борьбу со своей судьбой и влияние социальных факторов на формирование личности. Отдельный акцент сделан на философских идеях, которые нашли отражение в литературе реализма, таких как свобода воли, моральный выбор, предопределённость судьбы и взаимодействие человека с окружающим его обществом. Исследование показывает, каким образом русская литература XIX века не только запечатлела реалии эпохи, но и углубилась в экзистенциальные вопросы человеческого бытия.*

Ключевые слова: *Русский реализм, философия личности, социальная детерминированность, нравственный выбор, психологический анализ, судьба и предопределённость, художественное осмысление действительности, литература XIX века.*

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PHILOSOPHY OF SOUL AND SOCIETY: THE UNIQUENESS OF RUSSIAN REALISM OF THE XIX CENTURY

Abstract: *This article examines the key features of 19th-century Russian realism through the prism of philosophical concepts of the soul and society. Particular attention is paid to the analysis of the works of outstanding writers of this period - F. M. Dostoevsky, L. N. Tolstoy, I. S. Turgenev, A. P. Chekhov and I. A.*

Goncharov. It examines how the authors artistically interpreted the inner world of their heroes, their moral quests, the struggle with their fate and the influence of social factors on the formation of personality. Special emphasis is placed on the philosophical ideas that are reflected in the literature of realism, such as free will, moral choice, the predetermination of fate and the interaction of man with the society around him. The study shows how Russian literature of the 19th century not only captured the realities of the era, but also delved into the existential questions of human existence.

Key words: *Russian realism, philosophy of personality, social determinism, moral choice, psychological analysis, fate and predetermination, artistic understanding of reality, literature of the 19th century.*

Введение Русский реализм XIX века не ограничивался простым воспроизведением окружающей действительности, но стремился к её глубинному осмыслению, раскрывая сложные вопросы человеческого существования. Литература этого периода стала своеобразной ареной философских размышлений о природе человека, его внутреннем мире, моральных принципах и степени влияния общества на формирование личности. Русские писатели-реалисты не просто изображали жизнь, но анализировали её законы, выявляли противоречия между индивидуальными стремлениями человека и социальными условиями, заставляли читателя задуматься о смысле бытия, свободе выбора и неизбежности судьбы. Как подчёркивает литературовед В. В. Виноградов, «реализм XIX века превратил художественное произведение в средство познания мира» [1, 134], что свидетельствует о расширении функций литературы — она стала не только способом изображения жизни, но и инструментом философского осмысления реальности. Писатели того времени создавали образы, которые выходили за рамки художественных типов и становились символами вечных человеческих поисков, отражением глубоких экзистенциальных проблем. Так, в произведениях Ф. М. Достоевского социальные факторы становятся катализатором душевных кризисов. Родион Раскольников в «Преступлении и наказании» оказывается пленником собственной теории о «сверхчеловеке», но реальность разбивает его иллюзии. Внутренний конфликт героя ярко выражен в его сомнении: «Тварь ли я дрожащая или право имею?»[2, 109].Этот философский вопрос отсылает к идеям Ф. Ницше о моральном выборе, но в интерпретации Достоевского приводит не к возвышению личности, а к её разрушению. Л. Н. Толстой в «Войне и мире» показывает влияние общества через судьбу князя Андрея Болконского. Его путь — от честолюбивого аристократа до философа, стремящегося осмыслить смысл жизни, — символизирует поиск человеком своего места в мире. В его размышлениях звучит горькое осознание человеческой природы: «Если бы все воевали только по своим убеждениям, войн бы не было» [3, 18]. Как отмечает исследователь М. М. Бахтин, Толстой мастерски передаёт «взаимодействие исторического процесса и индивидуального сознания» [4, 223], показывая, что судьбы героев

неотделимы от движения эпохи, в которой они живут. Так, в «Отцах и детях» И. С. Тургенева нигилист Евгений Базаров противопоставляет себя окружающему миру, отрицая традиционные ценности и утверждая примат разума над чувствами. Его взгляд на природу выражен в категоричном заявлении: «Природа не храм, а мастерская, и человек в ней работник» [5, 107].Однако его рационализм оказывается иллюзорным перед лицом любви и смерти. Базаров, провозглашавший отказ от эмоций, оказывается бессильным перед собственной привязанностью, а его болезнь и трагический уход подчеркивают ограниченность человеческого разума перед силами жизни. В этом Тургенев показывает конфликт между теоретическим мировоззрением и реальным человеческим существованием. Не менее глубоко раскрывает тему внутреннего мира личности А. П. Чехов в рассказе «Человек в футляре». Главный герой Беликов живёт в постоянном страхе перед окружающей действительностью, стремясь спрятаться от неё за условностями и жесткими рамками правил. Его жизненное кредо сводится к тревожному предостережению: «Как бы чего не вышло» [6, 98].Этот страх перед переменами делает Беликова несчастным и подавленным, превращая его существование в замкнутый круг. Как отмечает литературовед Д. С. Лихачёв, «персонажи Чехова демонстрируют трагедию личности, подавленной социальными нормами» [7, 54]. Чехов через судьбу Беликова показывает, что отказ от живых чувств и стремление укрыться в «футляре» не спасают человека, а лишь лишают его полноценной жизни. Так, в романе И. А. Гончарова «Обломов» главный герой Илья Ильич Обломов становится пленником собственной пассивности и внутренней апатии. Его существование проходит в бесконечном откладывании перемен, неспособности противостоять обстоятельствам и обреченности на бездействие: «Лежал Обломов на диване… и вся его жизнь была в этом положении» [8, 79]. Обломовщина, как явление, отражает не просто индивидуальную черту характера, но и глубинный культурный кризис, характерный для русского общества XIX века. По мнению Ю. М. Лотмана, «Обломовщина — это не просто лень, а символ культурного кризиса» [9, 79]. В произведениях Ф. М. Достоевского судьба часто представляется как трагическая предопределенность, которой герои пытаются противостоять, но неизбежно оказываются пленниками собственной натуры. Например, в «Преступлении и наказании» Родион Раскольников, поверив в собственное право на преступление, сталкивается с мучительным внутренним конфликтом, который в конечном итоге приводит его к покаянию. Аналогично, в творчестве А. П. Чехова случайность играет решающую роль. В рассказе «Человек в футляре» главный герой Беликов, живущий в постоянном страхе перед любыми переменами, в конечном итоге становится жертвой собственной замкнутости. Чехов демонстрирует, как навязанные обществом нормы и страх перед жизнью могут привести к трагическому исходу. Таким образом, писатели русского реализма показали судьбу не как абстрактную силу, а как сложное явление, формируемое внутренним миром человека, его поступками и

воздействием внешнего мира. Заключение Русский реализм XIX века стал уникальным явлением в мировой литературе, объединив художественное и философское осмысление действительности. В произведениях Ф. М. Достоевского, Л. Н. Толстого, И. С. Тургенева, А. П. Чехова и И. А. Гончарова раскрываются глубинные вопросы человеческого существования: противоречие между личными убеждениями и общественными нормами, поиски смысла жизни, борьба между разумом и чувствами, влияние судьбы и случайности на человеческую жизнь.Литература этого периода не просто отражала реальность, но и помогала читателю осознавать сложность внутреннего мира человека.

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ДИНАМИКА ВНЕШНЕЙ СРЕДЫ СЕТЕВОЙ КОМПАНИИ БЫСТРОГО ПИТАНИЯ

Аннотация. *Сети ресторанов быстрого питания испытывают влияние сотен внешних факторов геополитического, экономического, технологического характера. Высокая подвижность среды вынуждает компании отрасли создавать специальные механизмы адаптации, связанные с внутренними управляемыми переменными, с концентрацией и распределением ресурсов. Сетевые компании отрасли, широко использующие франчайзинговую модель, имеют ряд особенностей. Результатом проведенного SWOT-анализа стали выявленные позитивные и негативные моменты в развитии компании «Yum! Brands», ее риски, вызванные изменением факторов внешней среды. Это позволило разработать конкретные предложения по корректировке корпоративной стратегии, а также бизнес-модели компании, с целью укрепления ее конкурентных преимуществ.*

Ключевые слова: *внешняя среда, быстрое питание, сети, франчайзинг, компания Yum! Brands, SWOT-анализ, маркетинговое планирование.*

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DYNAMICS OF THE EXTERNAL ENVIRONMENT OF A FAST FOOD CHAIN COMPANY

Abstract. *Fast food restaurant chains are influenced by hundreds of external factors of geopolitical, economic, and technological nature. High environmental volatility forces companies in the industry to create special adaptation mechanisms related to internal controllable variables, with the concentration and distribution of resources. Network companies in the industry that widely use the franchising model have a number of features. The result of the SWOT analysis was the identification of positive and negative aspects in the development of the company "Yum! Brands", its risks caused by changes in environmental factors. This allowed us to develop specific proposals for adjusting the corporate strategy, as well as the company's business model, in order to strengthen its competitive advantages.*

Keywords: *external environment, fast food, chains, franchising, Yum! Brands, SWOT analysis, marketing planning*

Стратегии развития сетей быстрого питания в XXI веке становятся все более актуальным объектом интереса практиков и теоретиков. Предметом многих исследований является стратегический анализ, его инструменты и методы, их применение в контексте маркетингового планирования. Так, Ф.Е. Караева исследовала проблемы использования SWOT-анализа, рассмотрела «..изучение возможностей и угроз, выявление сильных и слабых сторон с позиций стратегического управления организацией». При этом автор оценивает внутреннюю среду «..с помощью пяти функциональных областей: бизнес-администрирование; критерии найма сотрудников; качество продукции; маркетинговая деятельность; сбытовая политика» [6].

М.Э. Власов рассматривает стратегическое маркетинговое планирование как «..процесс разработки стратегий, которые способствуют достижению целей, поставленных перед руководством фирмы на основе поддержания стратегического соответствия между ними и потенциальными возможностями предприятия». И далее: «Определение маркетинговых стратегий необходимо производить с учетом влияния стратегических перспектив. SWOT-анализ направлен на выявление разнообразных возможностей и угроз, которые могут возникнуть во внешней маркетинговой среде; сильных и слабых сторон, которые определяются состоянием внутренней маркетинговой среды предприятия» [3].

М.Н. Шевченко детально исследовала макро- и микросреду предприятий, экономические, политико-правовые, природные, демографические, научно-технические, социально-культурные факторы «..с позиций практического применения таких стратегических инструментов, как PEST-анализ и SWOT-анализ». Такой подход, по мнению М.Н. Шевченко, позволяет «..минимизировать слабости за счет максимизации благоприятных возможностей внешней среды». Последнее утверждение нам представляется дискуссионным [10].

Т.А. Дудник, А.А. Кулешова сопоставляют возможности PEST-анализа, расширенного PESTLE-анализа, сценарного планирования, SWOT-анализа, с позиций их значения для маркетингового планирования [4].

Б.Ю. Сербиновский, А.А. Сербиновская, М.А. Белоус акцентируют необходимость «..прикладной разработки системы коммуникаций и сбыта продукции и услуг ресторанной сети с использованием современных IT-технологий, на основе моделирования и проектирования многофункционального веб-сайта, который позволяет расширить производственные и экономические возможности ресторанной сети, его интеграции в систему управления и бизнес-процессы сети ресторанов» [8].

Н.М. Сурай, И.М. Таточенко, Н.В. Пономарева, исследуя тенденции развития ресторанного комплекса г. Москвы, выявили «..способность экономических показателей к быстрому восстановлению после прекращения

возмущающих воздействий». Авторы применили корреляционную матрицу и уравнения регрессии, количественно оценили эффект роста оборота. Н.М. Сурай, И.М. Таточенко, Н.В. Пономарева убеждены, что такие методы «..могут быть использованы для прогнозирования значений рассмотренных переменных на горизонте два-три года» [9].

П.В. Бочков рассматривал «стратегический анализ деятельности предприятия общественного питания с позиций эффективного управления в условиях современного рынка, в условиях высокой конкуренции и быстро меняющейся рыночной среды. Особенно – на высококонкурентном рынке общественного питания, где успех зависит от способности оперативно реагировать на изменения внешних условий и внутренних возможностей» [2].

А.В. Шутяк исследовал отраслевую специфику быстрого питания, и «..ответную реакцию предпринимателей на динамику внешней среды» [11]. М.С. Зуева, А.А. Ярыгина связывают проведение SWOT-анализа предприятия с разработкой «программы повышения эффективности деятельности ресторана на базе стратегической карты» [5].

Рассмотренные подходы позволяют определить диапазон методов и сферу применения эмпирического анализа внешних и внутренних факторов развития сетей предприятий отрасли быстрого питания.

Объект анализа в данной статье – компания Yum! Brands, Inc. – собственник дорогих, известных брендов быстрого питания, таких как KFC, Pizza Hut, Taco Bell и The Habit Burger Grill.

«Yum! Brands, Inc.» – один из мировых лидеров в сфере фаст-фуд, ресторанов быстрого обслуживания. Компания, основанная в 1997 г., осуществляет коммерческую деятельность во многих странах мира через сеть собственных и франчайзинговых предприятий – всего более шестидесяти тысяч ресторанов в полутора сотнях стран, развивая и укрепляя имидж соответствующих брендов. Более девяноста процентов всех ресторанов сети работают по франшизе (2024 г.). Компанию отличает сильное присутствие в том числе в Китае и Индии. Общий оборот ресторанов всех брендов компании в 2024 г. составил более 67 млрд долларов, сумма прибыли – более миллиарда долларов [7]. Рыночная капитализация компании (стоимость акций, обращающихся на фондовом рынке) составляет более тридцати пяти млрд долларов (май 2025 г.)

Стратегия развития Yum! Brands опирается на модель франчайзинга, которая позволяет масштабировать операции и, одновременно – минимизировать инвестиционный риск. Обширная сеть предприятий позволяет Yum! Brands использовать положительный эффект «от масштаба», добиваться снижения уровня фиксированных затрат, оптимизировать цепочки поставок. Компания развивает оптовые поставки сырья и полуфабрикатов не только в собственные рестораны, но и своим франчайзи – это увеличивает «входной» денежный поток компании, создает дополнительный доход за счет маржи. Другая часть дохода компании – плата за франшизу: сначала

первоначальный взнос, затем – ежеквартальные роялти (процент от оборота франчайзи).

Компания одновременно реализует ряд так называемых «базовых» (по И. Ансоффу) стратегий [1]. Открытие новых ресторанов в существующих локациях, интенсификация и расширение деятельности существующих предприятий отражают стратегию «глубокого проникновения на рынок». Выход на новые географические рынки, особенно в странах с развивающейся экономикой, олицетворяет стратегию «развития рынков» (прежние товары на новых рынках). Развитие онлайн-продаж, цифровых услуг, расширение продуктовой линейки ресторанов компании соответствует базовой стратегии «развития товаров».

Проведенный SWOT-анализ деятельности Yum! Brands позволил нам выявить ряд сильных сторон компании, в том числе:

- значительный охват географических рынков, глобальное присутствие;
- сильный, конкурентоспособный портфель брендов (KFC, Pizza Hut, Taco Bell и The Habit Burger Grill);
- апробированная модель франчайзинга, позволяющая оптимизировать издержки и риски;
- продуктовые и технологические инновации;
- долгосрочные договоры с поставщиками по доступным ценам сырья;
- наличие собственной логистической сети;
- модель франшизы позволяет снижать собственные инвестиции.

Современные условия конкуренции заставляют Yum! Brands проводить цифровую трансформацию существующих бизнес-моделей [7].

Одновременно в деятельности компании наблюдаются «слабые» стороны, в том числе:

- высокий долг; снижение показателей ликвидности баланса;
- отрицательный «эффект от масштаба»;
- высокая степень зависимости от франчайзи;
- негативная тенденция продаж бренда Pizza Hut;
- различия в обучения персонала в странах присутствия;
- различия в операционных практиках в странах присутствия;
- сложности в обеспечении «нормативного соответствия» в ряде стран;
- экологические и юридические конфликты, разбирательства.

В условиях, когда «лучшие» рынки уже освоены, стремительный рост сети ресторанов в странах, отличающихся ограниченным платежеспособным спросом населения, отодвигает момент выхода на самоокупаемость, «точку безубыточности», замедляет срок окупаемости инвестиций, поэтому наряду с положительным, компания ощущает и отрицательный эффект «от масштаба».

Привлечение новых франчайзи выгодно компании, но контролировать менеджмент и качество в сети становится все труднее, механизмы мониторинга и контроля нуждаются в развитии, и дополнительных вложениях.

В числе возможностей компании мы выделяем:

- прирост населения в отдельных странах присутствия;
- рост среднего класса и платежеспособного спроса в отдельных странах присутствия;
- рост доли цифровых каналов продаж;
- высокие темпы роста в материковом Китае и Индии;
- расширение ассортимента за счет нетрадиционных продуктов, блюд, меню; адаптация к требованиям «здорового» питания;
- развитие цифровых услуг и экосистем; развитие цифрового взаимодействия с потребителями;
- стратегические приобретения ресторанов фаст-фуд, объектов логистической системы.

В числе угроз функционирования Yum! Brands мы выделяем:
- выход на рынок новых, современных игроков отрасли быстрого питания;
- изменение предпочтений потребителей, развитие вегетарианства, веганства, и т.п.;
- возрастающая волатильность цен сырья;
- усиление конкурентной борьбы, появление новых видов деятельности – субститутов;
- развитие корпоративных цифровых платформ, меняющих структуру традиционного рынка;
- геополитические угрозы, торговые войны, политико-экономическая нестабильность;
- усиление регуляторного давления со стороны государств.

Результаты проведенного анализа позволяют обосновать ряд выводов. Компания Yum! Brands располагает устойчивым конкурентным преимуществом за счет масштабов бизнеса, портфеля сильных брендов, широкого охвата рынков на разных континентах, опыта использования удачной модели франчайзинга. Перед компанией открываются возможности дальнейшего развития «вширь» и «вглубь». Однако целый ряд внешних и внутренних проблем, вызовов ставит под угрозу долгосрочное существование компании, среди них: относительно низкая финансовая устойчивость; отставание темпов роста отдельных брендов от конкурентов; тенденции перехода значительной части потребителей к модели «здорового питания». Особую обеспокоенность компании должно вызвать появление новых, современных конкурентов, быстро повышающих свою рыночную долю за счет новых технологий взаимодействия с потребителями.

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ИССЛЕДОВАНИЕ ВЛИЯНИЯ ЦИФРОВОЙ ВАЛЮТЫ НА ДЕНЕЖНО-КРЕДИТНУЮ ПОЛИТИКУ

Аннотация: *в последние годы, с развитием технологий и общества, цифровые валюты привлекли широкое внимание в глобальном масштабе. Как совершенно новый платежный инструмент, цифровая валюта не только изменила форму традиционной валюты, но и оказала глубокое влияние на традиционную денежно-кредитную политику. В этой статье будет рассмотрено влияние цифровых валют на денежно-кредитную политику со многих сторон, а также проанализированы проблемы и возможные корректировки политики.*

Ключевые слова: *Цифровая валюта; денежно-кредитная политика*

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RESEARCH ON THE IMPACT OF DIGITAL CURRENCY ON MONETARY POLICY

Summary: *In recent years, with the development of technology and society, digital currencies have attracted widespread attention on a global scale. As a completely new payment instrument, digital currency has not only changed the form of traditional currency, but also had a profound impact on traditional monetary policy. This article will explore the impact of digital currencies on monetary policy from multiple perspectives, as well as analyze the challenges and potential policy adjustments.*

Keywords: *Digital currency; monetary policy*

Влияние цифровых валют на денежно-кредитную политику в основном отражается на платежной системе и финансовой стабильности. Традиционная денежно-кредитная политика в основном управляет функционированием экономики, регулируя денежную массу, процентные ставки и т.д., в то время как цифровые валюты могут изменить эффект реализации традиционной денежно-кредитной политики, предоставляя более быстрые и удобные

платежные услуги. [147]Скорость обращения цифровых валют может быть более высокой, что приводит к более чувствительным изменениям в цепочке поставок валюты, что требует более гибкой корректировки денежно-кредитной политики. Кроме того, децентрализованные характеристики цифровых валют могут создать проблемы для способности регулирующих органов проводить денежно-кредитную политику, и для обеспечения финансовой стабильности необходимо разработать соответствующие меры регулирования.

Цифровые валюты создают новые проблемы для финансовых инноваций и финансового надзора. Появление цифровой валюты привело к развитию технологии блокчейн, что сделало финансовые инновации более удобными и эффективными. Однако анонимность и конфиденциальность цифровых валют могут создать трудности для финансового надзора, затрудняя регулирующим органам отслеживание потоков капитала и осуществление мер по борьбе с отмыванием денег. Поэтому регулирующим органам необходимо активно реагировать на вызовы, связанные с цифровыми валютами, и разрабатывать соответствующую политику регулирования для обеспечения стабильности и здорового развития финансовой системы.

Выпуск цифровых валют может оказать огромное влияние на национальную денежно-кредитную систему. Если страна запустит свою собственную цифровую валюту, это окажет разрушительное воздействие на существующую денежную систему и цепочку платежной индустрии. Поскольку цифровые валюты можно напрямую обменивать на традиционные валюты, это может привести к потере традиционных банковских каналов и даже оказать непредсказуемое влияние на денежно-кредитную политику центрального банка. Поэтому, чтобы разобраться с влиянием цифровых валют на национальную денежно-кредитную систему, необходимо углубленно изучить характеристики цифровых валют, чтобы минимизировать негативное влияние на экономику[148].

В дополнение к вышеуказанным эффектам, цифровые валюты также создают проблемы с финансовой безопасностью и защитой конфиденциальности. Как платежный инструмент, основанный на криптографии и технологии блокчейн, цифровая валюта может в определенной степени обеспечить безопасность и конфиденциальность транзакций. Однако в то же время существуют и такие риски, как кибератаки и мошенничество. Поэтому необходимо усилить безопасность и надзор за цифровыми валютами, чтобы гарантировать, что цифровые активы пользователей не пострадают. В то же время следует разработать

[147] Цзинвэнь В. Цифровой юань – официальная цифровая валюта Китая: юридическая природа и тенденции развития [Электронный ресурс] // Электронное приложение к Российскому юридическому журналу. 2022. № 1. С. 72–80. – URL: https://elibrary.ru/item.asp?id=48686310.

[148] Маслов А. В., Швандар К. В., Маклакова Ю. А. Цифровые валюты центральных банков и место цифрового рубля [Электронный ресурс] // Финансы и кредит. 2021. Т. 27. № 5 (809). С. 1058–1073. – URL:https://elibrary.ru/item.asp?id=45826745.

соответствующую политику защиты конфиденциальности, чтобы сбалансировать права пользователей на неприкосновенность частной жизни и потребности регулирующих органов.

Сталкиваясь с влиянием цифровых валют на денежно-кредитную политику, правительства и регулирующие органы должны активно изучать и понимать характеристики и потенциальное воздействие цифровых валют, чтобы сформулировать соответствующую политику и меры регулирования. Прежде всего, необходимо усилить надзор за рынком цифровых валют, чтобы обеспечить здоровое развитие рынка и сохранность активов пользователей. Во-вторых, необходимо создать систему законов и нормативных актов, связанных с цифровыми валютами, чтобы прояснить правовой статус и нормы использования цифровых валют. В то же время необходимо также укреплять сотрудничество с международным сообществом для совместного решения проблем трансграничного оборота и регулирования цифровых валют. Наконец, следует активизировать исследования в области цифровых валют и технологических инноваций, чтобы способствовать развитию финансовых технологий и модернизации финансовой системы.

Таким образом, влияние цифровых валют на денежно-кредитную политику — это вопрос, на который стоит обратить внимание. Появление цифровых валют изменило традиционную форму валюты и поставило новые задачи перед платежными системами, финансовой стабильностью, финансовыми инновациями и финансовым надзором. Правительствам и регулирующим органам необходимо активно реагировать на эти вызовы и разрабатывать соответствующую политику и меры регулирования для обеспечения того, чтобы развитие цифровых валют могло оказать положительное влияние на экономику и общество. Самое главное, что развитие цифровой валюты должно основываться на защите интересов пользователей и финансовой стабильности, а также на содействии устойчивому развитию цифровой экономики.

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СОЦИАЛЬНЫЙ АНАЛИЗ ЧРЕЗВЫЧАЙНЫХ СИТУАЦИЙ

Аннотация: *В статье рассматриваются современные социально-экономические аспекты управления рисками и обеспечения комплексной безопасности в условиях глобальных вызовов. Автор подчеркивает возрастание значимости безопасности как ключевого критерия качества жизни в XXI веке и необходимость выработки междисциплинарного подхода к решению глобальных проблем, включая демографические, экологические, техногенные и социополитические угрозы. Представлен анализ понятий «риск», «катастрофа», «кризис», «безопасность» в рамках социологии управления, исследуется влияние природных и техногенных чрезвычайных ситуаций на общественные процессы. Основное внимание уделено разработке социально-экономической системы управления рисками, переходу к концепции устойчивого развития и принятию стратегии допустимого риска в государственной политике.*

Ключевые слова: *социальная безопасность, управление рисками, чрезвычайные ситуации, устойчивое развитие, техногенные и природные угрозы, глобальные проблемы.*

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SOCIAL ANALYSIS OF EMERGENCY SITUATIONS

Abstract: *The article explores the contemporary socio-economic aspects of risk management and the provision of comprehensive security in the context of global challenges. The author emphasizes the increasing significance of security as a key indicator of quality of life in the 21st century and the necessity of adopting an interdisciplinary approach to address global issues, including demographic, environmental, technogenic, and socio-political threats. The concepts of "risk," "disaster," "crisis," and "security" are analyzed within the framework of management sociology, and the impact of natural and man-made emergencies on societal processes is investigated. Particular attention is paid to the development of a socio-economic risk management system, the transition to the concept of*

sustainable development, and the adoption of acceptable risk strategies in public policy.

Key words: *social security, risk management, emergency situations, sustainable development, technogenic and natural threats, global problems*

Введение. На разных этапах развития цивилизаций главными целями были достижение стабильно высокого уровня жизни, обеспечение благополучия и безопасности. Эти приоритеты сохраняются и в начале XXI века, однако значимость безопасности, ее вес в общей характеристике качества жизни сегодня существенно возросли. Обеспечение комплексной безопасности личности, общества, государства и мирового сообщества является важнейшей приоритетной задачей на ближайшие десятилетия и стало одной из главных целей стратегии существования цивилизации в современных и обозримых условиях.

Научно-технический и социально-экономический прогресс последних столетий кардинально изменил мир, значительно улучшив условия труда, качество жизни, образование и культуру. Вместе с тем технический прогресс проявил и свои негативные стороны, связанные с истощением природных ресурсов, рядом кризисных явлений в социальной, экономической и политической сферах, а также возникновением новых техногенных и природных угроз. Значительно возросла взаимозависимость природной и техногенной сфер.

В последние годы на фоне этих процессов сформировалось еще одно глобальное явление – глобализация, имеющая как положительные, так и отрицательные стороны. С негативной точки зрения глобализация проявилась в форме Глобальных проблем, возникновение которых предвидел В.И. Вернадский, который, в частности, предупреждал о «геологической силе» общества, которая может иметь разрушительный характер.

Основные глобальные проблемы заключаются в следующем. Прежде всего, на первое место выходят демографические проблемы, которые являются одной из первопричин роста населения, миграции, старения и ряда других глобальных проблем. Во-вторых, это экологическая проблема со многими ее компонентами, включая глобальное изменение климата и разрушение озонового слоя. В-третьих, это проблемы войны и мира. В-четвертых, стихийные бедствия и проблемы безопасности, вызванные деятельностью человека. Кроме того, актуальны такие вопросы, как энергетика, истощение невозобновляемых ресурсов, бедность, занятость, этнические конфликты, религиозная толерантность, преступность, терроризм и информационная безопасность.

Методы и исследования

В ходе работы использовались методы:

- Контент-анализа научных трудов и официальных документов, касающихся проблем риска и безопасности;

- Социологического анализа концепций «общества риска» (У. Бек, Э. Гидденс) и отечественных подходов к управлению чрезвычайными ситуациями;

- Сравнительного анализа международного и отечественного опыта в области реагирования на чрезвычайные ситуации природного и техногенного характера;

- Системного подхода, позволившего рассматривать риск и безопасность как комплексные социально-экономические категории.

XX век, вместе с его угрозами и опасностями, принес человечеству осознание необходимости определения общих путей борьбы с глобальными угрозами. Самое главное, конечно, идея устойчивого развития.

Еще одной важной областью является стратегия управления рисками. Анализ многих аварий и катастроф часто показывает, что их источником является не только стихия или техника, но и человек. Изменение отношения людей к себе и друг к другу является мощным ресурсом для решения глобальных проблем и повышения устойчивости нашего прогресса.

Масштаб проблем и задержка в их решении заставляют говорить об изменении научной картины мира. Важным направлением, способствующим эффективной научной борьбе с глобальными угрозами, является использование междисциплинарных подходов, которые играют значительную роль в системной интеграции всех направлений науки и помогают взглянуть на проблему в целом.

Таким образом, актуальность обозначенной темы социального исследования:

- необходимость формулирования проблемы перехода страны к устойчивому развитию и теоретических основ анализа и управления рисками - системы научных знаний для выбора алгоритма развития страны;

- необходимость реформирования государственной политики страны в области обеспечения безопасности населения и территорий на основе перехода от принципа абсолютной безопасности или нулевого риска к принципу приемлемого риска и, соответственно, разработки концептуальных принципов новой политики, ее методологических основ и методов ее практической реализации;

- переход к рыночной экономике и разработка экономических механизмов управления рисками предполагают полную оценку затрат с учетом соответствующих государственных потребностей, снижения рисков и выгод от хозяйственной деятельности, а также социальных обязательств;

- трансформация локальных и национальных рисков в трансграничные и глобальные риски и, соответственно, необходимость формирования концепции международной политики в этой области.

Кроме того, актуальность темы подчеркивается, в частности, необходимостью организации социально-экономического контроля за предупреждением и регулированием чрезвычайных ситуаций природного и техногенного характера.

Проблема риска не нова в западной и отечественной социологии. На социально-философском уровне абстракции, широко распространенном среди ученых, в частности, была разработана концепция «общества риска» У. Бека и Э. Гидденса. По мнению У. Бека, переход к обществу риска является «скрытым побочным эффектом» первоначального появления риска, поскольку риск является сущностью современного общества. Э. Гидденс подчеркивает универсализм, глобализацию, институционализацию риска, а также усиление риска в результате неожиданных побочных эффектов каких-либо факторов, конкретных человеческих действий как фактов современной социальной реальности.

Следует отметить, что в монографии О. Н. Яницкого «Социология риска» рассматриваются изменения в различных сферах общества, изменения социального порядка, формирование новых общностей под влиянием производства и распределения рисков. При этом большое значение имеет влияние жесткой среды на планы и структуры индивидуального поведения.

В отечественной социологии вопросы социально-экономической системы управления природными и техногенными рисками ранее не поднимались, хотя проблемы управления и организации экологических рисков в последнее время находятся в сфере научного интереса многих отечественных и западных социологов. Экологические риски, особенности их восприятия, принципы управления экологическими рисками в современном обществе рассматриваются в трудах многих ученых. При этом основное внимание исследователей сосредоточено на анализе истории формирования соответствующей структуры управления, разработке ее организационной структуры, анализе специфики ее деятельности.

Результаты оригинального авторского исследования. Результаты социальных исследований является анализ системы социально-экономического управления в чрезвычайных ситуациях природного и техногенного характера в современных условиях. Данная результаты определила следующие:

- анализ таких понятий, как «риск», «катастрофа», «кризис», «безопасность» в рамках социологии управления;
- изучить характерные черты природных и техногенных опасностей;
- определяет характер, уровень, правовые, социальные и иные механизмы управления системой социально-экономической безопасности;
- рассмотрение социальных, политических и правовых аспектов чрезвычайных ситуаций природного и техногенного характера;
-анализ социально-политических последствий чрезвычайных ситуаций и путей их ликвидации;
- определить основы создания социально-экономической системы управления природными и техногенными рисками.

Объектом исследования являются опасности природного и техногенного характера, возникающие в результате объективных явлений и деятельности человека.

Предметом исследования являются социальные основы, определяющие особенности управления системой безопасности населения и территорий в чрезвычайных ситуациях в современном обществе.

Заключение. В современном мире воздействие чрезвычайных ситуаций на социальные, экономические и политические процессы давно уже превысило тот уровень, который позволяет трактовать их как локальные сбои в размеренном функционировании социальных структур. Роль социально-политической составляющей мероприятий по ликвидации чрезвычайных ситуаций весьма велика. Его укрепление — стратегическая задача. Традиционный путь, основанный на количественном росте соответствующих сил и средств, повышении их профессионализма и технической оснащенности, недостаточен для обеспечения адекватного реагирования на устойчивый рост общества и рост разрушительной силы деструктивных процессов.

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РОЛЬ И ЗНАЧЕНИЕ НАЛОГОВЫХ ЛЬГОТ В СТИМУЛИРОВАНИИ ИНВЕСТИЦИОННОЙ СРЕДЫ

Аннотация: *Данное исследование посвящено повышению роли и значения налоговых льгот в улучшении инвестиционной привлекательности страны на основе анализа мнений и опыта учёных зарубежных государств. В работе рассматриваются тенденции предоставления налоговых льгот в стране, а также прямое влияние этих процессов на налоговые поступления и, в более широком смысле, на инвестиционную среду. Кроме того, в исследовании разрабатываются предложения по стимулированию значимости указанных вопросов.*

Ключевые слова: *налоги, инвестиции, льготы, государственный финансовый контроль, материальное производство, финансовый контроль, государственная политика, экономическая безопасность, рыночные отношения, денежные фонды, субъекты налогообложения, финансовая система, обязательные платежи.*

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THE ROLE AND IMPORTANCE OF TAX BENEFITS IN STIMULATING THE INVESTMENT CLIMATE

Annotation: This research is dedicated to enhancing the role and significance of tax incentives in increasing investment attractiveness in the country by analyzing the opinions and experiences of scholars from foreign countries. The study examines the trend of providing tax incentives in the country, as well as the direct impact of these processes on tax revenues and, more broadly, the investment climate. Furthermore, the research develops proposals aimed at promoting the importance of these issues.

Keywords: tax, investment, privilege, state financial control, material production, financial control, state policy, economic security, market relations, monetary savings, tax entities, financial system, mandatory payments.

Введение

В условиях глобализации привлечение инвестиций и эффективное их использование являются приоритетными задачами в обеспечении устойчивого

экономического роста любого государства. Инвестиции служат основой для создания рабочих мест, развития конкурентоспособного производства, наращивания экспортного потенциала и внедрения инноваций. В этой связи, как и в других странах, в узбекистане реализуются масштабные реформы по улучшению инвестиционного климата, в том числе путем снижения налоговой нагрузки и предоставления налоговых льгот.

Особое внимание уделяется приватизации, развитию предпринимательства, эффективному использованию земли и объектов недвижимости. Так, в 2021–2024 годах было реализовано государственное имущество на сумму 47 трлн сумов, что в 30 раз превышает аналогичный показатель предыдущего десятилетия.[149]

По данным официальной статистики, в узбекистане зарегистрировано более 424 840 предприятий и организаций, что на 72% больше по сравнению с 2015 годом. Эти данные свидетельствуют о прогрессивных изменениях в деловом климате республики. Налоговая политика играет ключевую роль в формировании инвестиционной среды. Стабильность, прозрачность и предсказуемость налоговой системы являются важнейшими факторами при принятии инвестиционных решений. Налоговые льготы способствуют притоку инвестиций, особенно в перспективные отрасли, слаборазвитые регионы и высокотехнологичные экспортно-ориентированные проекты.

Однако эффективность налоговых льгот требует постоянного анализа. Их нецелевое или избыточное применение может привести к снижению налоговых поступлений и ослаблению налоговой базы. Поэтому необходимо совершенствовать систему налогового стимулирования, учитывая международный опыт и национальные особенности.

Литературный обзор

Роль и значение налоговых льгот в регулировании инвестиционной среды были предметом исследований ряда зарубежных, а также отечественных учёных, которые стремились осветить эти вопросы в своих научных работах.

В частности, как отмечают а. Хасанов, д. Худоёров и о. Шеркулова (2024), статистический анализ показывает, насколько эффективно политические меры, такие как налоговые льготы, субсидии и государственные программы, способствуют росту инвестиций, а также подчеркивается, что экономическая эффективность проектов государственно-частного партнёрства напрямую связана с объемами инвестиций.

По мнению исследователей, инвестиции являются одним из основных двигателей экономического развития и обеспечивают долгосрочный устойчивый рост страны. Для эффективного привлечения инвестиций и рационального их использования необходимо обеспечить прочное сотрудничество между государственным и частным секторами,

[149] Президент Шавкат Мирзиёевнинг 27 март куни давлат мулкини хусусийлаштириш бўйича жорий йилги устувор вазифалар муҳокамаси юзасидан кенгайтирилган йиғилиши/ https://president.uz/uz/lists/view/7979

благоприятную деловую среду и экономическую стабильность. Это, в свою очередь, способствует ускоренному развитию национальной экономики.

По мнению ш. Нурматова (2023), налогоплательщики должны обладать гарантиями использования полученных ими льгот по назначению, и такие налоговые льготы могут быть направлены на соответствующие цели только при наличии законодательной системы, предусматривающей обязательное использование дополнительных полученных финансовых средств именно в рамках этих целей.[150]

Как подчёркивает ш. Мустафокулов (2020), политическая ситуация в стране, наличие природных ресурсов, предоставленные инвесторам льготы, состояние инфраструктуры и инвестиционный рейтинг регионов оказывают влияние как на приток иностранных инвестиций, так и на активизацию внутренних инвестиций. При этом объём инвестиций, направленных в основной капитал, служит основой для формирования инвестиционного и экономического потенциала.[151]

Согласно исследованиям б. Абдукаххорова (2022), налогообложение направлено на обеспечение устойчивого экономического развития страны, установление и укрепление международных связей с развитыми государствами, а также на достижение интеграции с мировым сообществом через улучшение и активное формирование инвестиционной среды. Применение налоговых льгот, в свою очередь, демонстрирует свою эффективность в достижении поставленных целей.[152]

Как отмечают han-sol lee, sergey u. Chernikov и szabolcs nagy (2022), наличие природных ресурсов также является важным фактором при привлечении инвестиций из южной кореи, однако его влияние особенно заметно в казахстане и узбекистане, тогда как институциональные показатели, такие как политические права и гражданские свободы, не оказали существенного воздействия на южнокорейские инвестиции.

Инвестиции, направленные на расширение рынка, как, например, южнокорейские, не ограничиваются только регионом, где начата деятельность, но могут быть ориентированы также на соседние области и сопредельные страны (экспорт в третьи государства). Территориальная связанность является решающим фактором при выборе местоположения предприятий.

Предлагаем создать межгосударственный комитет для проведения совместных исследований и развития инвестиций в дорожную инфраструктуру с целью улучшения внутренних логистических каналов. Для

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[150] Ш.Нурматов (2023) “Солиқ имтиёзларидан фойдаланишнинг хориж тажрибаси” https://iqtisodiyot.tsue.uz/journal/index.php/iit/article/view/270/306

[151] https://ejournal.tsue.uz/index.php/archive/article/view/3255/2435

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достижения этой цели принимающие государства должны упростить правила в транспортной сфере и сократить барьеры при выходе на рынок.[153]

Методология исследования

В данном исследовании для изучения влияния налоговых льгот на инвестиционный климат использовались методы сравнительного анализа, изучения мнений экспертов и анализа официальной статистики. В научной работе проведено сопоставление налоговой политики и опыта стимулирования инвестиционного климата в республике узбекистан и ряде развитых и развивающихся стран. Кроме того, на основе нормативно-правовых документов последних лет, реформ и данных об инвестиционных потоках проведён анализ влияния налоговых льгот на инвестиционную деятельность.

В ходе исследования с помощью метода контент-анализа были изучены отчёты экономических аналитических центров, государственного налогового комитета, министерства инвестиций, промышленности и торговли, а также международных организаций. Кроме того, в исследовании применялись методы нормативного анализа и сценарного анализа для оценки влияния действующих налоговых льгот на государственный бюджет и частные инвестиции.

Анализ и результаты

Налоговые льготы представляют собой предусмотренные налоговым законодательством преимущества для отдельных категорий налогоплательщиков по сравнению с другими, включая возможность не уплачивать налоги либо уплачивать их в меньшем размере.

В то время как налоговые поступления в бюджет нашей республики в 2024 году достигли 199,6 трлн сумов, согласно налоговой отчётности за 11 месяцев, были предоставлены налоговые льготы на сумму 72,5 млрд сумов.

[153] Han-Sol Lee, Sergey U. Chernikov, Szabolcs Nagy (2022) “Motivations and locational factors of FDI in CIS countries: Empirical evidence from South Korean FDI in Kazakhstan, Russia, and Uzbekistan” https://doi.org/10.15196/RS110404

млрд сум

№	Вид налога	2020 г.	2021 г.	2022 г.	2023 г.	2024 г. 11 месяцев
ВСЕГО		**31 065,6**	**43 899,6**	**72 963,7**	**69 777,9**	**72 565,8**
1	Налог на добавленную стоимость	24 643,3	36 766,3	64 107,9	57 289,0	61 354,1
2	Акцизный налог	0,0	0,0	24,5	1 236,1	0,0
3	Налог на прибыль	2 930,0	2 219,5	4 641,3	5 021,7	3 995,7
4	Подоходный налог с физических лиц (через налоговых агентов)	917,9	1 073,8	1 028,3	1 024,8	1 333,8
5	Налог за использование водных ресурсов	443,7	459,3	12,3	28,6	59,7
6	Налог на имущество юридических лиц	274,0	306,1	933,0	1 399,6	824,4
7	Земельный налог с юридических лиц	1 313,2	2 575,9	931,8	1 697,6	2 177,6
8	Социальный налог	346,5	386,3	1 187,4	2 002,3	2 610,8
9	Налог с оборота	196,9	112,3	97,2	78,2	209,7

Таблица 1. Информация о предоставленных льготах по видам налогов.[154]

Приведённая выше таблица показывает, что объём льгот в стране постоянно увеличивается. Это свидетельствует о том, что льготы предоставляются в правильных направлениях. Основной целью введения льгот является развитие определённой отрасли или направления, точнее — поддержка именно этой сферы. В налоговой политике нашей страны наряду с сокращением необоснованных льгот проводится политика по введению льгот, соответствующих требованиям нового времени. И самое главное — за счёт увеличения количества налогоплательщиков в данной сфере и улучшения их экономического положения объём налоговых льгот с каждым годом растёт.

[154] Подготовлено автором на основе данных сайта Soliq.uz.

млрд сум

Классификация	2020 г.	2021 г.	2022 г.	2023 г.	2024 г.
Налоговые поступления	103 566,0	127 970,0	148 388,0	165 916,0	199 539,0
Льготы	31 065,6	43 899,6	72 963,7	69 777,9	72 565,8
Доля в налоговых поступлениях	30%	34%	49%	42%	36%

Таблица 2. Информация о доле налоговых льгот в налоговых поступлениях.[155]

Данные данной таблицы показывают, что за последние 5 лет в среднем около 38% бюджетных поступлений оставалось в распоряжении налогоплательщиков и служило обеспечением их оборотных средств. Систематическое введение налоговых льгот повышает инвестиционную привлекательность региона и является важной поддержкой при привлечении инвесторов.

Рисунок 1. Доля различных видов налогов в общей сумме предоставленных льгот.[156]

Одной из причин контроля налоговых поступлений и стимулирования их роста из года в год можно считать применение налоговых льгот.

Если проанализировать налоговые льготы с точки зрения доли по видам налогов, то согласно данным, приведённым на рисунке 1, основную часть всех

[155] Подготовлено автором на основе данных сайта Soliq.uz.
[156] Подготовлено автором на основе данных сайта Soliq.uz.

используемых льгот в стране — около 85% — составляет НДС. Главной причиной этого можно считать тот факт, что данный налог косвенно входит в состав налогов и относится к числу налогов с наибольшей налоговой нагрузкой, поскольку начисляется на каждую добавленную стоимость.

Кроме того, следующие позиции занимают: 5,5% — налог на прибыль, 3,6% — социальный налог, 3% — земельный налог с юридических лиц, 1,8% — подоходный налог с физических лиц и прочие налоги.

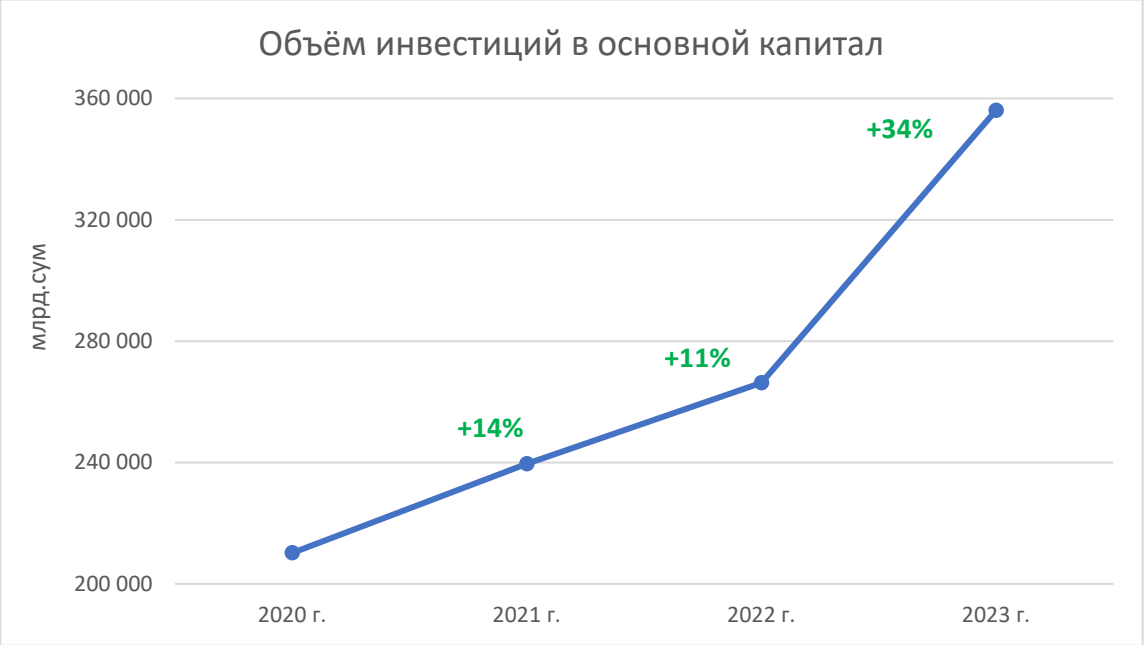

Рисунок 2.[157]

Из данных этого рисунка видно, что объём инвестиций также демонстрирует заметную тенденцию к росту из года в год. В 2020 году объём инвестиций составил 210,2 трлн сумов, а в 2023 году этот показатель достиг 356,1 трлн сумов.

Эти показатели также свидетельствуют о положительных изменениях в экономике и указывают на благоприятную и стабильную организацию экономической среды в стране.

Вывод

Вышеуказанные анализы показывают, что налоговые льготы, предоставляемые в правильном направлении, пропорционально влияют на изменение объёма налоговых поступлений. То есть, несмотря на значительный рост налоговых льгот из года в год, налоговые поступления также одновременно увеличиваются, причём темпы их роста даже превышают темпы роста льгот. Одной из основных причин этого является снижение налоговой нагрузки на налогоплательщиков и обеспечение их дополнительными оборотными средствами, что даёт им возможность расширять смежные виды деятельности.

[157] Подготовлено автором на основе данных сайта Stat.uz.

Однако из исследований некоторых учёных видно, что в отдельных случаях налоговые льготы могут быть вовсе незначимы, поскольку для инвесторов важен размер рынка в регионе. Тем не менее, для привлечения их на эти рынки необходимо правильно определить существующие барьеры и тщательно просчитать уровни экономической выгоды.

Кроме того, согласно исследованиям, льготы должны быть целенаправленными и ориентированными на поддержку конкретной отрасли или направления. Если льготы не будут направлены на определённые цели, их предоставление может привести к тому, что заранее запланированные результаты не будут достигнуты.

Обобщая все вышесказанное, можно предложить следующее: при предоставлении льгот необходимо прежде всего обеспечить их целевую направленность, правильно отобрать получателей — то есть определить, является ли льгота для них основным инвестиционным ресурсом или нет (как, например, в случае южной кореи). Кроме того, необходимо внедрить системы постоянной оценки эффективности льгот и на их основе принимать решения о продолжении или отмене данных мер.

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ПОВЫШЕНИЕ СОЦИАЛЬНОЙ АКТИВНОСТИ МОЛОДЕЖИ В ЦИФРОВОМ МИРЕ: ФИЛОСОФСКИЙ АНАЛИЗ

Аннотация. *Повышение социальной активности молодежи в условиях цифровизации имеет большое значение для развития общества. Цифровизация создает новые возможности для участия молодежи в общественной жизни, формирует новые формы общения и взаимодействия, способствует развитию гражданской активности и участия в принятии решений. В статье рассматриваются особенности повышения социальной активности молодежи в цифровом мире.*

Ключевые слова: *молодежь, активизм, социальный активизм, цифровизация, социальная сфера, общество, социальная активность, социальный активизм молодежи, молодежные инициативы.*

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INCREASING SOCIAL ACTIVITY OF YOUTH IN THE DIGITAL WORLD: PHILOSOPHICAL ANALYSIS

Annotation. *Increasing the social activity of youth in the context of digitalization is of great importance for the development of society. Digitalization creates new opportunities for young people to participate in public life, forms new forms of communication and interaction, and helps to develop civic engagement and participation in decision-making. This article highlights the specific features of increasing the social activity of youth in a digitalized world.*

Keywords: *youth, activism, social activism, digitalization, social sphere, society, social activity, social activism of youth, youth initiatives.*

В сегодняшнюю современную глобализированную, цифровую эпоху важнейшей и общей чертой человека, который поддерживает государственные и человеческие отношения в нашей стране, который осознает себя и координирует каждое действие, является его активность. Человек формируется и выражает свою идентичность именно в процессе различных видов деятельности. Поэтому активность или человеческая деятельность —

это не пассивный процесс, а активный процесс, который сознательно контролируется.

Социальная активность — широкое понятие, которое означает активность каждого человека в жизни, с точки зрения его места в жизни, в социальной реальности, происходящих в ней изменениях, его отношении к нововведениям, а также его участие в творчестве.

Постоянная актуальность изучения социальной активности молодежи обусловлена тем, что формирование каждого нового поколения происходит в разных условиях, а динамичное изменение социальной среды для каждого поколения ставит новые задачи и определяет рамки доступных инструментов для их реализации. Сегодняшние реформы реализуются в целях полной реализации талантов и способностей молодых людей, их благородных устремлений, повышения их социальной активности, занятия ими достойного места в жизни [2]. В частности, 4-м направлением Стратегии развития нового Узбекистана на 2022-2026 годы является «Реализация справедливой социальной политики, развитие человеческого капитала» [1], в котором особое внимание уделяется развитию человеческого капитала и усилению социальной активности молодежи. Само собой разумеется, что молодежь является активной частью населения нашей страны, что обуславливает необходимость ее изучения в условиях меняющегося общества, в том числе повышения ее социальной активности. Экзистенциальная потребность любого общества и его социальной сферы, в частности, в укреплении, обновлении и модернизации не может быть удовлетворена без активного участия молодого поколения в общественно-политических процессах.

Проблемы формирования и развития активности молодежи изучались философами, социологами, политологами и психологами во все периоды общественной мысли.

Проблема социальной активности молодежи весьма дискуссионна, как и содержание понятия социальной активности. Изучению социальной активности молодежи посвящены труды ряда ученых: Е.С.Соколова, Д.В.Кротов, А.В.Кострикин, С.П.Иваненков, В.З.Коган и др.

По мнению С.П.Иваненкова и А.В.Кострикина, «социальную активность можно рассматривать как увеличение участия в различных социальных практиках, направленных на общественное благо, по сравнению с принятыми нормами общества или определенной социальной группы, например, участие в общественных организациях и движениях, акциях, вступление в молодежные группировки» [5, 84].

Природа и сущность феномена социальной активности, ее структура и общие закономерности развития раскрыты в трудах таких ученых, как К.А.Абульханова-Славская, Е.А. Ануфриева, А.Н. Леонтьев, А.В. Мудрик, Т.Н. Малковская, В.А. Петровский, С.Л. Рубинштейн.

П.Д. Павленок рассматривает социальную активность как «сознательную, целенаправленную деятельность личности, социальной

группы, коллектива, направленную на изменение объективных социальных условий, на формирование социальных качеств личности» [9, 204].

Среди перечисленных определений отмечаются общие тенденции: «активность — качество личности как субъекта деятельности, а социальность подчеркивает ее направленность на деятельность и ее общественную значимость» [7, 323].

По мнению А.В. Иванова, «социальная активность — это сложное целостное качество личности, проявляющееся в активной, целенаправленной, общественно значимой деятельности и готовности действовать в интересах других людей» [7, 325]. Действительно, для повышения уровня социальной активности молодежи важно использовать технологию развития социальной активности.

Следует отметить, что современное общество переживает глобальные изменения, обусловленные развитием новейших информационно-коммуникационных систем и технологий. Эти изменения, связанные с базовым понятием «цифровой» (эпоха, цивилизация, экономика, политика, личность, управление, труд, образование и т. д.), создают новую реальность, новую личность и новое общество.

На современном этапе развития нашей страны формирование молодежи происходит в сложных условиях ломки устоявшихся ценностей и формирования новых отношений. То есть «...развивается в условиях риска, неопределенности» [4, 173]. В результате молодые люди испытывают чувство безысходности, растерянности, неуверенности в завтрашнем дне и нежелания что-либо менять в настоящем. Особенно ярко эти чувства проявляются у молодых людей, которые из-за отсутствия центрального звена в общественно полезной деятельности зачастую не имеют возможности проявить самосознание, лидерские и творческие качества. Снижение уровня социальной активности молодежи приводит к деградации личности и негативно влияет на развитие общества в целом. Кроме того, снижение социальной активности молодежи представляет собой реальную угрозу демократии, поскольку последующие поколения все реже участвуют в соответствующих социальных практиках.

Известно, что молодые люди более активны в виртуальном мире (они не только общаются в социальных сетях, играют в онлайн-игры, смотрят фильмы и слушают музыку, но и пытаются заработать, освоив новые навыки, которые в будущем станут их социальным или материальным капиталом). Действительно, цифровой мир снижает уровень физической активности (молодые люди больше времени проводят дома и в виртуальном мире, чем раньше). В результате «длительнее становится время сна и позже приходится ложиться спать, что изменяет и нарушает биологические ритмы»[8].

Молодые люди, если не могут найти для себя социальный путь или какую-либо форму проявления социальной активности, становятся более чувствительными, склонными к депрессии и апатии. Направление этой энергии в сферу социальных практик (Р.В. Иванов [6], О.А. Полюшкевич [10],

П.А. Трескин [13]) позволяет им находить различные ниши социального служения (волонтерская и волонтерская деятельность). Если по каким-то причинам этого не удается достичь, то часто можно отметить процессы отчаяния, которые приводят к проявлению недовольства, основанного на иррациональных мотивах и суждениях (Р.Г. Ардашев [3]).

В современных условиях таким важным фактором, определяющим новый вектор развития социальной активности, становится цифровизация, виртуализация различных сторон общения и социального взаимодействия. Сегодня практически каждый человек, особенно молодежь, так или иначе соприкасается с виртуальным миром или является его участником. Соответственно, виртуальная реальность — это пространство, где открываются широкие возможности для проявления, реализации социальной активности, а также самореализации — способностей, возможностей, развития [12].

Одним из факторов, определяющих возрастающее влияние виртуального мира на личность, является открытость доступа к нему. Технической и материальной основой массового доступа к виртуальной реальности является повсеместное распространение и доступность тарифных планов для устройств, ее обеспечивающих — смартфонов, компьютеров, а также услуг доступа в Интернет [11]. Данный фактор также расширяет свое позитивное и негативное влияние на социализацию молодежи.

Преимущества цифровизации для повышения социальной активности молодежи:

Во-первых, расширение возможностей для общения и взаимодействия. Эти аспекты позволяют молодым людям легко общаться, обмениваться информацией, организовывать мероприятия и кампании, находить единомышленников для решения общих проблем.

Во-вторых, возможность получения информации и образования. В связи с этим Интернет предоставляет широкий спектр образовательных ресурсов, онлайн-курсов и информации, которые служат повышению уровня знаний и навыков молодых людей, расширению их мировоззрения.

В-третьих, принятие решений и участие в общественном диалоге. Цифровые платформы позволяют молодым людям участвовать в обсуждении актуальных вопросов, высказывать свое мнение и предложения, влиять на принятие решений на местном и национальном уровнях.

В-четвертых, развитие критического мышления и цифровой грамотности. Этот аспект поможет молодым людям развить навыки работы с цифровыми технологиями, критического анализа информации, оценки рисков и возможностей, ответственного поведения в цифровой среде.

В-пятых, поддержка молодежных инициатив и проектов. Этот фактор позволит искать финансирование на цифровых платформах, продвигать молодежные проекты и инициативы, а также обмениваться опытом и сотрудничать среди молодежи.

Можно также сказать, что развитие цифровой грамотности и критического мышления как необходимые условия успешной цифровизации социальной активности молодежи; обучение молодежи навыкам безопасного и эффективного использования цифровых технологий, а также критической оценки информации является ключевым фактором успеха. При этом необходимо будет устранить цифровое неравенство, обеспечив равный доступ к цифровым технологиям и ресурсам, а также обеспечить всем молодым людям, независимо от их социального статуса и места проживания, доступ к Интернету и цифровым устройствам.

Для повышения социальной активности молодежи в цифровизированной среде необходимо уделять внимание созданию безопасной и инклюзивной цифровой среды. Это создает необходимость разработки механизмов защиты молодежи от негативных явлений в цифровой среде, таких как кибербуллинг, дезинформация и экстремизм, а также обеспечения равных возможностей для всех молодых людей.

Помимо вышеперечисленных факторов, важным является также вопрос поддержки молодежных инициатив и проектов. Поскольку необходимо создавать условия для реализации молодежных инициатив, направленных на решение социальных проблем и повышение социальной активности молодежи.

Еще одним важным аспектом является сотрудничество государства, общества и молодежи. Для разработки эффективных стратегий и мер по повышению социальной активности молодежи в цифровизированной среде необходимо наладить конструктивный диалог между государством, общественными организациями и молодежью.

В заключение следует отметить, что цифровизация открывает огромные возможности для повышения социальной активности молодежи, однако для реализации этих возможностей необходимо учитывать как преимущества, так и риски цифровой среды, а также создавать условия для формирования у молодежи критического мышления и ответственного поведения в цифровом пространстве. Поскольку цифровизация создает новые возможности для участия молодежи в общественной жизни, формирует новые формы общения и взаимодействия, способствует развитию гражданской активности и участия в принятии решений.

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СОВРЕМЕННЫЕ ТЕНДЕНЦИИ В ИССЛЕДОВАНИИ СИНДРОМА ПОЛИКИСТОЗНЫХ ЯИЧНИКОВ: ПАТОГЕНЕТИЧЕСКИЕ МЕХАНИЗМЫ, ДИАГНОСТИЧЕСКИЕ ПОДХОДЫ И ТЕРАПЕВТИЧЕСКИЕ СТРАТЕГИИ

Резюме: *Синдром поликистозных яичников (СПКЯ) является одной из наиболее распространенных эндокринных патологий у женщин репродуктивного возраста. Данное заболевание характеризуется хронической ановуляцией, гиперандрогенией и специфическими изменениями в структуре яичников. В статье рассматриваются современные представления о патогенезе, клинических проявлениях, диагностических критериях и подходах к лечению СПКЯ. Особое внимание уделяется роли инсулинорезистентности, влиянию дефицита витаминов, а также психоэмоциональным аспектам заболевания. Описаны современные методы медикаментозной, хирургической и вспомогательной терапии, включая использование сенситайзеров инсулина, антиандрогенов, гормональных контрацептивов и лапароскопических методов. Рассматриваются перспективные направления исследований, направленные на улучшение диагностики и разработки персонализированных терапевтических стратегий.*

Ключевые слова: *синдром поликистозных яичников, гиперандрогения, инсулинорезистентность, гормональная терапия, диагностика, лапароскопия, антиандрогены, витамин D, психоэмоциональные нарушения, репродуктивное здоровье.*

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MODERN TRENDS IN THE RESEARCH OF POLYCYSTIC OVARY SYNDROME: PATHOGENETIC MECHANISMS, DIAGNOSTIC APPROACHES AND THERAPEUTIC STRATEGIES

Abstract: *Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders in women of reproductive age. This condition is characterized by chronic anovulation, hyperandrogenism, and specific structural changes in the*

ovaries. The article examines current concepts of the pathogenesis, clinical manifestations, diagnostic criteria, and treatment approaches for PCOS. Special attention is given to the role of insulin resistance, vitamin deficiencies, and the psycho-emotional aspects of the disorder. Modern methods of pharmacological, surgical, and adjunctive therapy are described, including the use of insulin sensitizers, antiandrogens, hormonal contraceptives, and laparoscopic techniques. Promising research directions aimed at improving diagnosis and developing personalized therapeutic strategies are also discussed.

Keywords: *polycystic ovary syndrome, hyperandrogenism, insulin resistance, hormonal therapy, diagnosis, laparoscopy, antiandrogens, vitamin D, psycho-emotional disorders, reproductive health.*

Ведение Синдром склерокистоза яичников, синдром поликистозных яичников, а также синдром Штейна-Левенталя — различные названия одного и того же патологического состояния, характеризующегося нарушением процесса созревания фолликулов и отсутствием овуляции. Это приводит к развитию характерных симптомов, включая бесплодие, нарушения менструального цикла и гиперандрогению, проявляющуюся оволосением по мужскому типу. Из-за многообразия клинических проявлений понимание природы данного синдрома остается неоднозначным даже среди медицинских специалистов.

Важнейшим аспектом диагностики СПКЯ является клиническая картина, а методы визуализации играют лишь вспомогательную роль в постановке диагноза [1].

Цель исследования – оценить современные тенденции в исследовании синдрома поликистозных яичников - патогенетические механизмы, диагностические подходы и терапевтические стратегии.

Материалы исследования. В данной обзорной статье мы стремимся систематизировать современные научные достижения, касающиеся данной проблемы. Впервые синдром поликистозных яичников (СПКЯ) был описан американскими гинекологами Ирвингом Штейном и Майклом Левенталем.

Результаты и обсуждение. В исследованиях представили детальное описание патологии, отметив сочетание аменореи и множественных мелких кист в обоих яичниках. Однако с течением времени этот диагноз стали применять к любым нарушениям менструального цикла без выявления конкретных причин. Лишь в 2003 году на Роттердамской конференции ведущие европейские эксперты сформулировали четкие диагностические критерии СПКЯ, что позволило стандартизировать подходы к его выявлению.

Таблица 1. Критерии диагностики СПКЯ по Роттердамскому консенсусу (2003).

№	Критерии	Достоверный метод диагностики
1	Клинические или биохимические признаки гиперандрогении	Клиническое обследование (наличие гирсутизма, мужской тип телосложения, и др), или уровень тестостерона, DHEA в крови.
2	Олиго- или ановуляция	Ультразвуковая фолликулометрия
3	Поликистозные яичники по данным УЗИ	УЗИ: визуализация не менее 12 фолликулов диаметром 2-9 мм как минимум в одном яичнике и/или объем хотя бы одного яичника более 10 $см^3$. При этом фолликулы расположены диффузно по периферии (симптом «жемчужного ожерелья»); также, возможны утолщение капсулы.

Диагноз синдрома поликистозных яичников (СПКЯ) устанавливается при наличии не менее двух из трех вышеуказанных критериев. При этом отсутствие характерных ультразвуковых признаков поликистозных яичников не исключает диагноз, поскольку у некоторых пациенток количество антральных фолликулов или размер яичников может не соответствовать установленным критериям. Как и большинство хронических заболеваний, СПКЯ характеризуется как краткосрочными, так и долгосрочными проявлениями. К краткосрочным симптомам относят нерегулярный менструальный цикл, гирсутизм, акне, бесплодие, алопецию, себорею, ожирение, депрессивные состояния и снижение качества жизни [15,2]. Важно учитывать, что нарушения, вызванные СПКЯ, оказывают значительное психоэмоциональное воздействие на женщин. Согласно исследованиям, у пациенток с данным синдромом отмечается высокая частота депрессивных и биполярных расстройств, что отрицательно сказывается на их качестве жизни. Психоэмоциональные аспекты СПКЯ стали предметом активного изучения в последние годы. У женщин с этим заболеванием синдром хронической депрессии встречается в 4 раза чаще, а генерализованное тревожное расстройство – в 7 раз чаще, чем в общей популяции [9].

В связи с этим особую значимость приобретает комплексная медицинская реабилитация, включающая психологическую поддержку пациенток с СПКЯ. Основной целью патогенетически обоснованных программ реабилитации является не только восстановление функции яичников, но и улучшение качества жизни пациенток, что делает этот аспект терапии крайне актуальным. Синдром поликистозных яичников (СПКЯ) связан с рядом долгосрочных осложнений, требующих своевременной диагностики и контроля. Среди них особенно выделяются: сахарный диабет 2 типа (риск 10%), предиабет (40%), метаболический синдром (40%), повышенный риск сердечно-сосудистых заболеваний, гиперкоагуляция крови, что увеличивает вероятность венозных тромбоэмболий, а также гиперплазия и рак эндометрия [20]. Выбор тактики лечения СПКЯ требует

междисциплинарного подхода. Несмотря на то, что назначение терапии традиционно входит в компетенцию гинекологов, участие эндокринолога в ведении пациенток считается целесообразным для обеспечения комплексного подхода к лечению. В последние годы появились исследования, указывающие на значительную роль витаминов и нутрицевтиков в терапии СПКЯ. В частности, витамин D способствует улучшению липидного профиля и снижению инсулинорезистентности [16]. Витамин B12, как показали исследования, при наличии метаболического синдрома у женщин с СПКЯ может улучшать показатели чувствительности к инсулину [14,21]. Диета с ограничением углеводов положительно влияет на выраженность атеросклероза. Исследования показывают, что у пациенток с СПКЯ количество рецепторов к конечным продуктам гликирования в гранулёзных клетках превышает среднее значение для популяции, что делает эти клетки более уязвимыми к повреждающему воздействию метаболитов [18].

Среди медикаментозных подходов лечения СПКЯ особое место занимают препараты, влияющие на гормональный баланс. Спиронолактон, являясь конкурентным антагонистом альдостерона, связывается с андрогенными рецепторами и подавляет активность 5α-редуктазы, что способствует увеличению уровня липопротеинов высокой плотности (ЛПВП) в крови. Флутамид – нестероидный антиандроген, который ингибирует превращение тестостерона в его активную форму – дегидротестостерон, что приводит к уменьшению проявлений гиперандрогении и нормализации показателей холестерина, триглицеридов и липопротеинов низкой плотности (ЛПНП) [16]. Метформин, относящийся к группе бигуанидов, является гипогликемическим препаратом, повышающим чувствительность тканей к инсулину. Он широко применяется при лечении сахарного диабета 2 типа, а в случае СПКЯ способен подавлять выработку андрогенов клетками теки в яичниках. Однако эффективность метформина у разных пациенток варьируется, что делает его дальнейшее изучение необходимым [21,17]. Ципротерона ацетат и хлормадинона ацетат входят в состав гормональных контрацептивов, сочетая противозачаточное и антиандрогенное действие [1]. Тактика ведения пациенток с синдромом поликистозных яичников (СПКЯ) должна определяться на основании этапов диагностики, начиная с раннего выявления заболевания и предполагаемой морфологии яичников. Важно учитывать, что в большинстве случаев специфическая клиническая симптоматика отсутствует [15]. Кроме того, небольшие кистовидные образования в яичниках могут оставаться незамеченными при бимануальном обследовании, что делает ультразвуковую диагностику (УЗИ) неотъемлемой частью диагностического процесса. Ведение пациенток предполагает использование трансабдоминального и трансвагинального ультразвукового сканирования с цветным допплеровским картированием, а при необходимости – применение магнитно-резонансной томографии (МРТ) и лапароскопии [2].

При выборе терапевтической стратегии необходимо учитывать наличие инсулинорезистентности у пациентки. Одним из наиболее безопасных и доступных методов лечения является коррекция образа жизни, направленная на снижение массы тела. Исследования показывают, что потеря 10-20% массы тела способствует улучшению всех клинических проявлений СПКЯ у пациенток с ожирением. Ключевым аспектом диетического подхода является ограничение потребления легкоусвояемых углеводов, что способствует улучшению инсулинового ответа и благоприятно влияет на дислипидемию, повышая уровень липопротеинов высокой плотности (ЛПВП) и снижая концентрацию триглицеридов [19,3]. Использование микронизированного натурального прогестерона при СПКЯ демонстрирует выраженный клинический эффект, способствуя восстановлению регулярной овуляции и активации фолликулогенеза, что подтверждается данными динамического УЗИ [10,3]. В лечении также применяются эстроген-гестагенные препараты, инсулиновые сенситайзеры, а при необходимости проводится оперативное вмешательство – лапароскопический дриллинг яичников [6].

Хирургическое лечение СПКЯ обеспечивает временное улучшение состояния, в то время как консервативная терапия направлена на достижение беременности. Однако проблема СПКЯ остается актуальной, поскольку методы лечения пока не обеспечивают полной коррекции нарушений [4]. Современные достижения в области эмбриологии и генетики открывают перспективы для разработки новых биомедицинских технологий, которые могут стать эффективной альтернативой медикаментозному лечению. Однако высокая стоимость и ограниченная доступность подобных методов являются серьезными препятствиями на пути их широкого внедрения [11]. Анализ отечественной и зарубежной литературы свидетельствует о высокой распространенности СПКЯ среди женщин репродуктивного возраста. Рост числа диагностируемых случаев, вероятно, связан с совершенствованием методов диагностики, а также негативными экологическими факторами. Несмотря на активные исследования, патогенез СПКЯ остается не до конца изученным и пересматривается ежегодно с учетом новых научных данных. В настоящее время особое внимание уделяется онтогенетическому аспекту заболевания, в том числе изучению внутриутробных маркеров, которые могут оказаться ключевыми для понимания механизмов развития данной патологии.

На сегодняшний день влияние различных групп витаминов на развитие и течение синдрома поликистозных яичников (СПКЯ) остается недостаточно изученным.

Выводы. Таким образом в современных исследованиях, посвященных лечению СПКЯ, уделяется недостаточное внимание психотерапии, направленной на коррекцию психологического состояния пациенток, что является важным аспектом комплексного подхода к терапии. Социальная значимость СПКЯ обусловлена также тем, что данное заболевание признано доказанным фактором риска развития рака яичников. В связи с этим становится очевидной необходимость совершенствования методов

диагностики, лечения и профилактики СПКЯ, включая как медикаментозные, так и инструментальные подходы. Внедрение в клиническую практику новейших научных достижений позволит повысить эффективность ведения пациенток с данным синдромом.

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ЭНДОМЕТРИОЗ КАСАЛЛИГИНИНГ КЛИНИК КИЧИШИ ВА ДИАГНОСТИКАСИНИНГ ХУСУСИЯТЛАРИ

Резюме: *Бугунги кунда эндометриоз касаллигини тарқалиши частотасининг юқорилиги туфайли замонавий гинекологиянинг долзарб мавзуларидан бирига айланиб улгирди. Оғир клиник белгилар, қайталаниш тендентсияси ва кичик чаноқ аъзоларида битишманинг тез ривожланиши шунингдик малигнизатсияланиш эҳтимолига эгалигидир. Патологик жараённинг ривожланиши ва унинг тарқалиши билан эндометриоз аутоиммун жараёнлар фонида гормонал мувозанат билан боғлиқдир. Аёл танасининг тизимли касаллиги, кейинчалик репродуктив тизимнинг, чаноқ аъзоларининг кўплаб функсияларининг бузилиши ва аёлнинг психосоматик эмотсианал ҳолатига таъсир курсатади. Эндометриоз гетеротопияларни тубдан олиб ташлашнинг иложи йўқлиги эса касаллик беморларнинг ҳаёт сифатини пасайтиради, хомиладор булишга салбий таъсир қилади. Биринчи аломатлар пайдо бўлишидан ташхис қўйиш ва даволанишни бошлашгунча бўлган давр нисбатан узоқлиги билан тавсифланади.*

Калит сўзлар: *эндометриоз, репродуктив тизим, эндометриознинг гетеротопиялари*

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FEATURES OF THE CLINICAL COURSE AND DIAGNOSIS OF ENDOMETRIOSIS

Summary: *Today, endometriosis has become one of the most relevant topics in modern gynecology due to its high prevalence. Severe clinical symptoms, a tendency to relapse and rapid development of adhesions in the pelvic organs, as well as the possibility of malignancy.*

The development and spread of the pathological process is associated with hormonal imbalance on the background of autoimmune processes. Being a systemic disease of the female body, it further leads to disruption of many functions of the reproductive system, pelvic organs, affects the psychosomatic and emotional state of a woman. The inability to completely remove endometriotic heterotopias reduces the quality of life of patients and negatively affects fertility. The period from the

appearance of the first symptoms to the diagnosis and the start of treatment is characterized by a relatively long period.

***Key words**: endometriosis, reproductive system, endometriotic heterotopias*

Кириш. Бир қатор муаллифларнинг маълумот беришларича, эндометриоз билан касалланиш аёлларнинг репродуктив тизимининг барча касалликлари орасида 7%- 10% дан 80% ни ташкил қилади. Бироқ, эндометриознинг ҳақиқий частотаси номаълум. Гинекологик касалликлар структурасида мазкур касаллик яллиғланиш касалликлари ва миомадан кейин учинчи ўринда туради [1,2].

Эндометриоз касаллиги бизнинг минтақамизда кам диагностика қилинади, аммо бу касаллик бизда кам учрайди, дегани эмас. Кўплаб беморлар бошқа ташхислар билан самарасиз даволаниб, азоб чекиб юрганлиги эндиликда бизга маълум. Эндометриоз туфайли бепуштликка дучор бўлган аёллар хам талайгина. Кам диагностика қилиниши билан бирга, уни даволашда ҳам бир қанча камчиликларга йўл қўйилмоқда. Тан олиш лозимки, бизда ҳозирги пайтда эндометриоз билан оғриган беморларни олиб боришда аниқ ва ягона даволаш протоколи хали ишлаб чиқилмаган.

Ишнинг максади. Эндометриоз касаллигининг клиник кичиши ва диагностикасининг хусусиятларини щрганиш.

Тадқиқот материаллари ва муҳокамаси

Эндометриоз касаллиги асосан репродуктив ёшдаги аёлларда ривожланади, лекин ҳайз даври мунтазамлашган қизларда ва усмир беморларда (15-17%), пери ва постменопозал аёлларда (8-10% гача) ҳам учрайди. Операция қилинган барча беморларда эндометриоз ва бачадон миомасининг комбинатсияси 46-85% га этади. Хулоса маълумотларга кўра, Қўшма Штатларда эндометриоз репродуктив ёшдаги аёлларнинг тахминан 70-80 %ида бепуштлик, ҳайз даврининг бузилиши ва оғриқ кузатилган.

Одатда эндометриоз кам учрайдиган касалликлардан бири сифатида қаралади. Аслида эса, асосланган тиббиёт маълумотларга қараганда, кенг қамровли рандомизатсияланган текширишларнинг кўрсатишича, лапароскопия қилинган аёлларнинг 10% да турли катталикдаги эндометриоз учоқлари топилган [3]. Аммо, жуда кўп холатларда улар хеч қандай клиник белгиларсиз кечади ва аёлни безовта қилмайди. Яна кўп ҳолларда эндометриоз енгил ёки ўрта даражали алгодисменорея кўринишида кечади. Бундай холларда камдан кам эндометриоз ташхиси қўйилади, одатда бошқа диагнозлар – турли яллиғланиш касалликлари ёки инфантилизм ташхиси остида беморлар олиб борилади [4,5].

Эндометриоз - гормонларга боғлиқ патологик жараён бўлиб, эндометрий тўқимасининг бачадон бўшлиғидан ташқарида жойлашиши билан характерланади. Ундан фарқ равишда аденомиоз эндометрий тўқимасининг миометрийга ўсиб киришидир. Биринчи навбатда кичик чаноқ аъзолари – тухумдон, фаллопий найлари, тўғри ичак-бачадон боғламалари, йўғон ичакнинг ректосигмоидал бўлими ва сийдик пуфаги зарарланади. Касаллик

гематоген йўл билан тарқалганда бошқа узоқ органлар – буйрак, упка, кўз конъюнктиваси каби орган зарарланади [5,6].

Эндометриоз деярли фақат репродуктив ёшда учрайдиган касалликлар жумласига киради. Эндометриоз учрайдиган ўртача ёш 25-29 ни ташкил этади. Постменопаузадаги аёлларда эса, хатто ўринбосар гормонал терапия қўлланган тақдирда ҳам, жуда камдан кам холларда эндометриоз симптоматикаси намоён бўлади.

Касалликнинг этиология ва патогенези ўзига хос бўлиб, унинг келиб чиқиши ва ривожланишини тушунтириб берувчи метапластик, имплантатсион, механик, гематоген назариялар мавжуд. Хозирги вақтда учта назария – имплантатсион, гематоген ва механик назариялар тан олинади. Имплантатсион назарияга кўра, хайз қонининг ретроград оқиши натижасида эндометрий хужайралари кичик чаноқ бўшлиғига киради ва турли аъзоларга имплантатсияланади [7]. Гематоген назарияга кўра, эндометрий фрагментлари (бўлакчалари) қон томирлар ва лимфа томирлари орқали тарқалади, бунда экстрагенитал эндометриоз ривожланади. Механик назарияга биноан, эндометрий фрагментлари ҳар хил хирургик операциялар вақтида операцион жарохатга ёки қорин бўшлиғига тушиб қолади ва кўпая бошлайди.

Эндометриознинг ирсиятга боғликлиги хакида ҳам талайгина далиллар мавжуд. Эндометриоз билан оғриган беморнинг опа-сингилларида ёки онасида эндометриоз учраш хавфи 7%ни ташкил этади. Бутун популятсияда эса бу хавф 1%га тенг [6].

Иммунитетнинг пасайиши ҳам эндометриозга олиб келувчи омиллардан биридир. Нормада организмнинг исталган жойида пайдо бўлган бегона хужайралар иммун тизими томонидан йўқ қилинади. Иммун тизимдаги етишмовчилик ўз-ўзидан аёнки, эктопик жойлашиб қолган эндометрий хужайраларининг ўсишига ва алоҳида учоқ хосил қилишига шароит яратади.

Эндометриоз классификацияси асосан, локализатсияга асосланган классификациядир. Бу бежиз эмас. Зеро, касаллик клиникаси эндометриоз учоғининг қаерда жойлашганига чамбарчас боғликдир. Албатта даволаш тактикаси хам шундан келиб чиқади.

Аввало, генитал ва экстрагенитал эндометриоз фарқланади. Генитал, яъни жинсий аъзолар эндометриози хам ўз навбатида икки гурухга – ички ва ташқи эндометриозга ажратилади. Ички генитал эндометриоз деганда эдометриоз тўқимасининг бачадон миометрийсида ривожланишига айтилади. Бошқача айтганда бу аденомиоз деб хам айтилади.

Экстрагенитал шакллар - топографик жиҳатдан репродуктив тизимнинг аъзолари ва тўқималарига боғлиқ бўлмаган ва қорин бўшлиғи аъзолари (ичак, сийдик пуфаги, аппендикс), ўпка ва плевра бўшлиғи, терига таъсир қилади , буйраклар , кўзнинг конъюнктиваси, оёқ-қўллари, мия ва бошқалар.Ташки генитал эндометриознинг тарқалишига қараб, кичик формалари, ўрта оғирликдаги ва оғир формалари фарқланади. Кичик формалар – қорин парда ва тухумдонларда битишма ва чандиқларсиз кичик-кичик учоқларнинг борлиги билан таърифланади. Ташқи эндометриознинг оғир формаси – бир

тухумдонда (ёки хар иккала тухумдонда) диаметри 2 см дан ортиқ кисталар хосил бўлиши, кучли ифодаланган парооваріал ва най олди учоқлари ва битишмалари, найларнинг деформатсияси ва облитератсияси, дуглас бўшлиғи облитератсияси сийдик йўллари ва ичакларнинг патологик жараёнга тортилиши киради [1,3].

Аденомиёз билан патологик жараённинг 3 та шакли (диффуз, тугунли ва фокал) ва 4 босқич (шиллиқ қават остидаги қатламнинг шикастланиши, миёметриумнинг ярми қалинлиги, бутун миометрия, бачадоннинг сероз мембранасининг ўсиши) мавжуд. Шу муносабат билан кундалик клиник амалиётда ички эндометриознинг (аденомиёз) шакллари ва оғирлиги, ташқи генитал эндометриознинг тарқалиши ва инвазивлик даражаси, тухумдон эндометриоз кисталарининг ҳажми, ретросервикал эндометриознинг оғирлиги пайдо бўлиши билан клиник белгилари юзага чиқади.

Эндометриоз диагностикасида анамнез ва физикал текширишлар катта аҳамиятга эга. Циклик такрорланиувчи оғриқ синдроми унинг ўзига хос асосий белгиларидан бири. Шуни таъкидлаб ўтиш жоизки, далилларга асосланган тиббиёт кўрсатмаларига кўра, вагинал кўрик ултратовуш текширишидан кўра анча информатив усул ҳисобланади. Агар эндометриоз кичик чаноқ бўшлиғи сохасида жойлашган бўлса, тегишли жойда оғриқли тугунчалар пайпасланади. Ретротсервикал эндометриозга диагноз қўйишда ректал текшириш кўпроқ маълумот беради [4,5].

Ултратовуш текшириши динамикада ўтказилганда жиддий диагностик ахамиятга эга бўлиши мумкин. Бунда УТТ ни камида икки марта – хайз кўришдан олдин ва кейин ўтказиш мақсадга мувофиқдир. Эндометриоз тугуни хайз кўришдан олдин катталашади, хайз тугагандан кейин эса аксинча, кичраяди. Бу феномен эндометриоз диагностикасида патогномоник рол ўйнаши мумкин;

• гистеросалпингография (аденомиёз даражасини, бепуштликнинг тубо-перитонеал омилини аниқлаш имконини беради; ҳайз давринининг 5-7-кунидан кечиктирмай, бачадон бўшлиғини сувда эрувчан контраст билан тулиқ тўлдириш орқали амалга оширилади);

• лапароскопия (ташқи генитал эндометриоз, кичик шакллар, битишмалар, дифференциал диагностика учун юқори диагностик аҳамиятга эга; бир вақтнинг ўзида даволаш имконияти, чаноқ аъзоларининг ўсма белгиларини аниқлаш, гормонал диагностика (умумий шакллар учун, дифференциал диагностика зарурати, ўрин босар гормонал терапиясининг самарадорлигини назорат қилиш) амалга оширилади);

Касалликнинг клиник манзараси одатда менструатсиянинг оғриқли бўлиши билан намоён бўлади. Қорин пастида ва белдаги оғриқ дисменорея, диспареуния, баъзан ациклик оғриқ шаклида бўлиши мумкин. Экстрагенитал эндометриозни, яъни эндометриоз учоғининг кичик чаноқ аъзоларидан ташқарида жойлашиши бутунлай ўзгача клиник манзарага эга бўлади, хар бир зарарланган аъзолар томонидан келиб чиқадиган белгиларга сабаб бўлади. Масалан упка эндометриозида- қон туфлаш ва плеврит белгилари; операцион

жароҳат эндометриозида- жароҳатнинг шишиши ва оғриқли бўлиши, терининг зарарланиши кўзатилиши мумкин. ҳар қандай ҳолатда ҳам мазкур оғриқлар циклик такрорланиб туради ва айнан шу нарса диагноз қўйишда муҳим аҳамиятга эга. Диспареуния (оғриқли жинсий алоқа) ва алгодисменорея билан келган барча беморларда эндометриозни истисно қилиш лозим бўлади [5]. Ҳар бир орган учун ўзига хос клиник кўринишлар мавжуд бўлса, бу касалликнинг умумий симптомлар мажмуаси мавжуд. Бунга қуйидагилар киради:

Оғриқ синдроми, табиатда циклик ("ҳайзли") бўлиб, патологик жараённинг узоқ давом этиши учун прогрессивлик ва қатъийлик тендентсияси билан. Оғриқнинг локализатсияси ҳар хил бўлиши мумкин, лекин кўпинча у икки томонлама бўлиб, бел сохаси, чаноқ суягига, анусга тарқалади. Қаттиқ оғриқ ва диспареуния одатда ректовагинал ҳудуднинг чуқур инфилтратив эндометриози билан боғлиқ бўлади. Кистларнинг микроперфоратсияси билан перитонит ҳодисалар ривожланиши мумкин (кўнгил айниши, қусиш, метеоризм, тана ҳароратининг кўтарилиши); эндометриоз кистанинг ёрилишида «ўткир қорин» синдроми кузатилади ва перитонитга олиб келиши мумкин.

Алгоменорея (дисменорея), меноррагия (кўпинча аденомиоз билан), ҳайздан олдин ва кейинги қон кетиш, "контакт" қон кетиши, ҳайз кўриш ритмининг бузилиши ва бошқалар каби ҳайз даврининг бузилиши. Репродуктив функтсиянинг пасайиши,бачадон найчаларининг обструктсияси, деформатсияланиши, ва қорин пардага ёпишиши билан тухумдонларнинг тўлиқ изоляцияси, тухумдонлар тўқималарининг бевосита шикастланиши (овуляциянинг бузилиши) оқибатидир.

Диспареуния – жинсий алоқа пайтида оғриқ бўлиб, унга сабаб қўйидалардир: эндометриоз учоғининг бачадон ортида жойлашиши, тухумдоннинг эндометриоз кастаси, эндометриоз натижасида бачадоннинг орқага букилиши ёки силжиши [4].

Бачадон шиллиқ пардаси билан синхрон тарзда эктопик учоқларда ҳам циклик ўзгаришлар кўзатилади, аммо хеч вақт эндометрийнинг десквамативсияси кўзатилмайди. Сурункали оғриқ синдроми. Турли интенсивликдаги оғриқ синдроми аёлнинг бахтли турмуш кечиришига халақит беради, иш қобилиятини пасайтиради.

Одатда Эндометриознинг экстрагенитал формалари - упка, буйрак, қорин парда эндометриози ва бошкалар ногироликка олиб келиши мумкин. Эндометриозни даволашдан олдин даволаш усилини танлаш мақсадга мувофиқ бўлади. Даволаш усили касалликнинг шаклига, клиник кечишига, давомийлигига қараб, шунингдек, беморнинг талаблари асосида хал қилинади. Даволаш мақсади оғриқни вақтинча қолдириш, бемор ахволини маълум муддатга яхшилаш ёки оператив даволаш орқали бутунлай тузатиш бўлиши мумкин.

Хулоса:

Замонавий гинекология амалиётда эндометриозни даволашда қуйидаги усуллар қўлланилади: консерватив яъни гормонал, гормонал бўлмаган ва жарроҳлик, шунингдик комбинатсияланган (жарроҳлик ва консерватив). Жарроҳлик даволашнинг мақсади ўзгармаган (макроскопик ва палпатсия қилинадиган) тўқималарда эндометриоз ўчоқларини максимал даражада кесишдир. Ёш аёлларда репродуктив функтсияни сақлаб қолиш мақсадга мувофиқдир, шунинг учун кам инвазив ва реконструктив операцияларга интилиш керак. Ёш аёлларда қисқа вақтдан бери давом этаётган эндометриоз аниқланганда, яхшиси, кутиш тактикасига амал қилган маъқул. Бунда хеч қандай даво чораси қўлланилмайди. Кенг кўламли рандомизатсияланган тадқиқотларда маълум бўлдики, даволаш бундай аёлларда натижани деярли ўзгартирмайди. Даво курси олган аёлларда 72% холларда 1 йил давомида хомиладорлик рўй берган.

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АЁЛЛАРДА СИЙДИК ТУТОЛМАСЛИК КАСАЛЛИГИНИНГ ЖАРРОХЛИК ДАВОЛАШ

Резюме: *Аёлларда зурикиш натижасида сийдик тутолмаслик замонавий тиббиётнинг кенг таркалган ва мураккаб муаммосидир. Сийдик тутолмаслик (СТ) касаллиги сунгги йилларда урогинекологик касалликлар ичида юкори уринда бормокда. Сийдик тутолмасликнинг профилактикаси ва даволаш масалалари маиший, иктисодий ва психологик ахамиятига кура долзарблигини саклаб колмокда.*

Калит сўзлар: *аёлларда сийдик тутолмаслик, жаррохлик, даволаш*

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SURGICAL TREATMENT OF URINARY INCONTINENCE IN WOMEN

Annotation: *Stress urinary incontinence in women is a common and complex problem of modern medicine. Urinary incontinence (UI) is one of the most common urogynecological diseases in recent years. The issues of prevention and treatment of urinary incontinence remain relevant due to their social, economic and psychological significance.*

Keywords*: urinary incontinence in women, surgery, treatment*

Кириш. Аёлларнинг ёши ошиб бориши билан СТ касаллиги учраши хам ошиши аникланган, 30 ёшгача булган аёлларда 20% ни ташкил килган булса 50 ёшдан ошган аёлларда 30-56%гача етмокда. Аноним суровлар натижасига кура хакикатдан хам СТ касаллиги билан огриганлар хар 4 та аёлдан бирида маълум булган, аммо уялиш хисси туфайли бу аёлларнинг хар 10 тадан бири шифокорларга мурожаат этишади. СТ билан огриган беморларда аста секин яллигланиш касалликлари хам кушилади. Бундай беморларда атроф мухитга нисбатан психикаси хам узгариб боради. Шу жихатдан бундай холат ижтимоий касаллик хисобланади. Тиббиётнинг такомиллашувига карамасдан бутун дунёда сийдик тутолмаслик билан касалланган аёллар сони камайган эмас. Bump. R.C. Norton.P.A. маълумотларига кура АКШда СТ таркалганлиги 37%, Европа мамлакатларида 26%ни, Англияда 29%ни, шаркий ярим шар

мамлакатларида (Сингапур, Покистон, Тунис) 20% ни, Россияда 30-34%ни ташкил килган.

Ишнинг максади. Аёлларда зурикиш билан боглик сийдик тутолмаслик касаллигини жаррохлик усулида даволаш самарадорлигини урганиш.

Тадқиқот материаллари ва муҳокамаси

Текширишларни биз ВО ва БСМ гинекология булимида 2023-2025 йилларда 25 ёшдан 70 ёшгача даволанган 64 та беморларда утказдик. Марказ буйича 2023-2025 йилларда жами 85 та кин операциялари утказилган булиб, шу беморлардан 38 (44,7%) тасида СТ касаллигининг у ёки бу даражаси кузатилган. Текширишлар ретроспектив ва проспектив равишда олиб борилди. Текшириш объектлари икки гурухга булиб урганилди. Биринчи асосий гурухга жаррохлик усули билан даволанган 38 (59,4%)та бемор аёллар киритилди. Иккинчи назорат гурухга эса консерватив усулда даволанган 26 (40,6%)та аёллар киритилди. Барча беморларнинг уртача ёши 42,8 ни ташкил килди. Текширилган беморларнинг турмуш тарзи урганилганда: кишлок ахолиси 43 тани (67,3%), шахар ахолиси эса 21 тани (32,7%) ташкил килди. Шулардан уй бекалари 39 та (60,1%), ишчилар 14 та (21,8%), ва хизматчилар 11 та (17,1%) дан иборат эди.

Текшириш давомида беморларнинг хозирги вактдаги хайз куриш функциялари урганиб чикилди. Бунга кура 41 та холатда аёлларнинг хайз куриш фаолияти сакланган булиб (1-гурухда 18 та холат, 2-гурухда 23 та холат), 23 та холда (1-гурухда 20 та холатда, 2-гурухда 3та холатда) аёлларда хайз куриш фаолияти булмаган.

Касаллик сабабларини аниклашда анамнез маълумотларидан фойдаланилди.

Сураб суриштириш натижалирга кура касалликни келтириб чикарган сабабларга кура куйидагилар аникланди.

Жадвал №1.

1. огир мехнат фаолияти билан	13 (20,3%)
2. куп сонли тугруклар (5 ва ундан куп)	15 (23,4%)
3. тугрукларда кин ва оралик йиртилиши	18 (28,1%)
4. йирик хомилалик ва тугрукнинг чузилиши билан	8 (12,5%)
5.ёшга боглик жинсий аъзолар пролапси	4 (6,2%)
6. яллигланиш касалликлари	6 (9,3%)

Касалликнинг давомийлиги: 6 ойдан 1 йилгача булган беморлар сони 13 та. 1 йилдан 3 йилгача 29 та. 3-5 йил 15та. 5 йилдан куп 7 тани ташкил килди.

Беморларда СТ касаллигининг енгил ва урта даражаси энг куп аникланган булиб, уларнинг стационарга мурожаат этишларига касаллик даражасининг огирлашуви сабаб булган. Огир даражали шакли билан эса беморлар мурожаат этганлари аникланмади. Касалликнинг даражасини аниклашда биз С Janssen тамонидан таклиф килинган критерийдан фойдаландик. Енгил даражаси 4-6 балл, урта огир даражаси 7-9 балл, огир

даражаси 10-12 балл билан аникланади. Унга кура касалликнинг огирлик даражаси куйидаги жадвал билан ифодаланади.

Жадвал №2.

Критерийлари		баллар
СТ нинг учраши	-бир ойда 4-5 марта -хафтада бир неча марта -хар куни	1 2 3
тагликлардан фойдаланиш	-хеч качон -баъзан -доимо	1 2 3
ажралган сийдик микдори	-бир неча томчилаб - оз-оз микдорда - куп микдорда	1 2 3
Мехнат фоалиятининг бузилиши	- хеч качон - баъзан - доимо	1 2 3

Жадвал №3.

Касалликнинг клиник куриниши	Асосий гурух	Назорат гурухи
-кин деворлари силжиши	8	11
-цистоцеле	7	5
-цисто-ректоцеле	11	2
-бачадон тулик ва нотулик тушиши	5	-
-бачадон буйни патологияси	2	-
-бачадон миомаси билан	2	-

Назорат гурухидаги беморларга даволаш сифатида а-адреномиметиклар, урин босувчи гормонал даволаш (УБГД) ва гимнастик машклар буюрилди. Даволаш 2-3 ой давомида олиб борилди. Гимнастик машклар сифатида Кегел гимнакстикаси ва чанок туби мушакларини машк килдириш каби гимнастикалар буюрилди. Машклар кунига 5-6 маротаба, хар машкда мушаклар кискартириш харакатлари 15-20 маротаба такрорлаш билан олиб борилди. УБГД беморларга схема буйича утказилди. а-адреномиметиклар билан даволаш курслар буйича утказилди.

Асосий гурухдаги беморларга даволашнинг турли жаррохлик усули танланган ва утказилган. Операциянинг тури беморлардаги касалликнинг клиник куриниши ва кушимча гинекологик касалликларни эътиборга олиб танланди. Юкоридаги №3 жадвалда келтирилган.

-Олдинги кольпо-уретропластика операцияси 8 та беморда утказилган,

-олд кольпорафия ва орка кольпо-перинеопластика операцияси 19 та беморга утказилган,

-бачадон буйни патологияси булган беморларга Манчестер операцияси 3та холатда утказилган,

-8 та холатда пластик операциялар билан бирга курсатмаларга биноан кин оркали гистерэктомия операцияси утказилган.

Бизнинг текширишларимизга кура асосий гурухдаги ва назорат гурухидаги беморларда даволашнинг самарадорлиги турли натижани курсатди. Асосий гурухдаги беморларда операциядан сунгги давр силлик кечган булиб, стационарда уртача 7-9 кун давомида реаблитацион муолажаларни олишган. Операциядан сунг беморлар стационарда уртача 9 кун булишган. Сийдик пуфагига колдирилган Фолея катетери 5 суткада олинган.

Асосий гурухдаги барча беморларда жавоб бериш олдидан сийдик тутолмаслик белгилари бартараф булган.

7 та (18%) беморда операциядан кейинги дастлабки кунда кисман ёки тулик сийдик тутилиши кузатилди. Шундан 4та холатда бу уз-узидан 2 кун мобайнида утиб кетиши аникланди. 3 та беморга эса медикаментоз даволашга тугри келди ва а-адреномиметиклар билан даволанди. Операция натижаси 1 йил давомида кузатиб борилди. 6 ой давомида барча беморда сийдик тутолмаслик ва дезурия каби асоратлар юзасидан шикоят килиш аникланмади. Факат 2 та (5,2%) беморда 9-11 ойда енгил даражадаги СТ белгилари юзага келган. 2-йилда ёши 55 ёшдан юкори булган 3 та (7,8%) беморда хам касалликнинг енгил даражаси билан кайталаниши аникланди. Шундай килиб биринчи йилда жаррохлик усулининг самараси 94,8% ни ташкил килган булса, иккинчи йилда 86,9% ни ташкил килди. Икки йил давомида жами 5 та беморда касаллик кайталаниши аникланган булса, уларга а-адреномиметиклар ва холиноблокаторлар тавсия этиб даволанди. 1 та холатда жаррохлик усули кайта кулланилди.

Назорат гурухида (26та) беморларнинг факат 18 (69,2%) таси даволаниш муолажаларини ва машкларини тулик 2 ой давомида олишга муваффак булишди. Колган 5 та (19,7%) холатда беморлар муолажаларни мунтазам бажара олмаган. 3 та холатда адреномиметикларнинг ножуя таъсирига кура биз муолажаларни ман килишга мажбур булдик. Мунтазам даволанган 18 та бемордан 12 та холатда касалликнинг енгил даражаси булиб, 6 та холатда СТнинг урта огир даражаси аникланган эди. 3 ойдан сунг касаллик белгиларининг йуколиши СТ нинг енгил даражаси булган беморларда 9 тасида (75%) колганлиги аникланди. Колган 3та (25%) холатда даволаш самарасиз булиб чиккан. Аммо кузатишлар давомида даволаш муолажаларини тугатгандан сунг дастлабки 1-йилда СТ белгилари 9 та аёлдан 4 (44,4%) тасида кайта пайдо булган. Бундай беморларга даволаш муолажалари яна такрорлаш тавсия этилди. Консерватив даволанишларни мунтазам давом эттира олмаган 5 та, а-адреномиметикларнинг ножуя таъсири натижасида муолажаларни тугатишга мажбур булган 3 та беморга кейинчалик даволашнинг жаррохлик усули тайинланди ва утказилди. Урта даражадаги СТ булган 6 та холатдан 4 (66%) тасида касаллик енгил даражага утган булса, 2 (34%) та холда даволаш самарасиз якунланган ва бу беморларга хам даволашнинг жаррохлик усули таклиф килинган. Назорат гурухидаги коникарли натижа барча холатларда ёш аёлларда кузатилди. Даволаш самараси манфий булган холатларда аёлларнинг ёши 45 ёшдан юкори булганлиги аникланди.

Хулоса:

Сийдик тутолмаслик касаллиги асосан асоратли тугруклардан сунг яъни тугрукларда кин деворларининг ва ораликнинг йиртилишидан сунг (28,1%) юзага келган. Текширилган барча холатлардан СТ асосан катта ёшли ва климактерик ёшдаги беморларда кузатилган. Беморларнинг купчилигида кин деворларининг осилиши, ораликнинг эски йиртилганлиги, цистоцеле, ректоцеле холатлари аникланиб, бу хам сийдик тутолмасликнинг келиб чикишида сийдик пуфаги ва уретранинг анатомик жихатдан бузилиши натижасида эканлигини курсатди. Консерватив даволаш СТ касаллигининг енгил даражалари билан булган холатларда 75% коникарли натижани берган булса, урта даражали СТда тулик бартараф килмасдан факатгина 66% холатда енгил даражага утган. Жаррохлик усули касалликнинг даражасидан катъи назар дастлабки йилда 94% ижобий натижани берган булса, кейинги йилда 86% холатда коникарли натижа берган. Сийдик тутолмаслик касаллигида беморларнинг ёши, кушилиб келган гинекологик касалликларини хисобга олган холда жаррохлик даволаш усули асосий хисобланади.

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БАРМОҚ ФАЛАНГАЛАРИ СИНИШЛАРНИНГ СУД ТИББИЙ ЖИХАТЛАРИ

Резюме: *Бугунги кунда бутун дунё мамлакатларида механик фактлари таъсири билан боғлиқ жарохатланишлар травматизм таркибида доимий равишда етакчи ўринни эгаллаб келмоқда, улар орасида таянч-ҳаракат тузилмалари жарохатлари 22% дан 43 %гачани ташкил этган бўлса, қўл панжа суякларининг зарарланиши умумий жарохатланишларнинг 25,4-28,4% ни ташкил қилади ва шундан 55% дан ортиғи очиқ жарохатларга тўғри келади. Қўл панжа суяклари жарохатлари полиморфлиги ва суяк тузилмаларининг турли хилли деформацияси билан тавсифланиши, ушбу тузилмаларнинг анатомик ва функционал хусусиятларига бевосита боғлиқлиги билан изоҳланади. Қўл панжа соҳада силжувчан тузилмалар мавжудлиги ва бу соха суяклари хамда нейроваскуляр тузилмаларининг ўта мураккаб анатомо-топографик ўзаро боғлиқлиги, бундай жароҳатланишларга доир юқори технологияли, қулай, зарарлари кам бўлган ва жароҳатлар битгунга қадар тузилмаларни маҳкам ушлаб туришни таъминлайдиган ҳамда имкон қадар қисқароқ вақтда қўл панжа ҳаракатини тиклайдиган методларни ишлаб чиқишни тақоза этади.*

Калит сўзлар: *бармок фалангалари, синишлар, оқибатлар, даволаш усули.*

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FORENSIC ASPECTS OF FINGER PHALANGE FRACTURES

Abstract: *Today, countries around the world experience the highest number of cases of mechanical injuries, among which musculoskeletal injuries account for 22% to 43% of cases if they are caused by trauma. Bone marrow damage occurs in 25.4-28.4% of cases of malignant neoplasms and leads to malignant neoplasms in about 55% of cases. Polymorphism of bone formations and deformations of bone structures caused by their deformation are directly related to the anatomical and functional features of these structures. In the field of neuromuscular structures and neuromuscular fibers in this area, anatomical and topographic studies are carried out aimed at identifying pathologies, lesions and damage to neurovascular structures. Michael is credited with inventing a method that would allow him to get a more accurate idea of what is happening in the galaxy than ever before.*

Keywords: *phalanges, fractures, consequences, method of treatment.*

Кириш. Бармоқ фалангаларининг синиши қўл жарохатларининг енг кенг тарқалган тури ҳисобланади. фалангаларнинг асоси, диафиз ва тирнок сегментлари синишлари тафаввут этилади. Ушбу синишлар келиб чиқиши бевосита ва билвосита механизм билан боғлиқ бўлиши мумкин. Ушбу тузилмаларнинг очиқ ва парчаланган синишлари мавжуд.

Қўл панжа суяклари синишининг оғирлик даражасини аниқлаш тирик шахслар экспертизасида асосий муаммолардан бир ҳисобланади. Хозирги вақтда суд тиббий экспертиза жараёнида мазкур тузилмалар синишнинг оғирлик даражасини аниқлаш, соғлиқнинг бузилиши давомийлиги ва умумий меҳнат қобилиятнинг турғун йўқотилиш миқдорига (%) асосланади. Бироқ, қўл панжа суяклари синиши типи, тури ва жойлашув ўрнига кўра, ҳамда бу соҳага ёндош тузилмалар жарохатланиш ҳолатларида, соғлиқнинг бузилиш муддатлари ва умумий меҳнат қобилиятининг турғун йўқотилиш миқдори турлича бўлиши мумкин. Бинобарин, мазкур тузилмалар синишининг табиати, асоратлари ва узоқ оқибатлари жуда хилма-хиллиги билан таърифланади ва бу ҳолатлар узун найсимон суяклар синиши жиҳатларидан тубдан фарқ қилади [1; 4]. Бу ҳолат, қўл панжа тузилмалари хусусияти ҳамда тузилмаларнинг ўзаро ўта мураккаб анатомо-топографик боғлиқлиги билан изоҳланади.

Бундан ташқари, қўл панжа суяклари синиши муддатини аниқлаш масаласи ҳам бугунги кунга қадар суд-тиббиёти амалиётида тўлалигича ҳал этилмаган муаммо бўлиб қолмоқда. Суяк синиши соҳасидаги репаратив жараённинг рентгено-морфологик тасвири, синиқлар муддатини аниқлашга асос бўлиши мумкин [2; 3; 5; 6; 7].

Ишнинг мақсади – тумтоқ воситалар таъсири билан боғлиқ жарохатланишларида бармоқ фалангалари синишлари, тури, шаклланиш механизми ва оғирлик даражасини аниқлаш.

Тадқиқот материаллари ва муҳокамаси

Республика ихтисослаштирилган травматология ва ортопедия илмий-амалий тиббиёт маркази Самарқанд филиалида 2020-2021-йилларда қўл панжа суяклари жароҳати билан амбулатор даволанган 14 ёшдан 74 ёшгача

бўлган 111 нафар беморлар текширув ва даволаш натижалари ташкил этди. Текшириш ва даволаш амалдаги стандартга мувофиқ ўтказилди. Текширувдан ўтказилган ва даволанган беморларнинг 88 нафари эркак (79,2%) ва 23 нафари аёллар хисобланади (20,7%). Энг кўп жароҳатланишлар 18 ёшдан 44 ёшгача бўлганларда (54.9%) қайд этилган – жадвал №1.

Жадвал 1

Беморларнинг ёш бўйича тақсимланиши

№	Ёши	Эркак	аёл	Абс.	%
1.	18-24	50	11	61	54,9
2.	25-40	23	10	33	29,7
3.	41-60	12	1	13	11,7
4.	61-74	3	1	4	3,6
Жами		88 (79,2%)	23 (20,7%)	111	100

Тадқиқот натижалари ва муҳокамаси.

Бармоқ фалангалари синишлари кўпинча ўз бўйи баландлигидан йиқилиш (56,7%), спорт жароҳати (10,8%), қўл панжасини оғир жисмлар босиши (8,1%), тўмтоқ қаттиқ жисмлар зарбаси (7,2%) ва бармоқларнинг (қўл панжа) тўмтоқ қаттиқ жисмларга урилиши (6,3%) натижасида кузатилди. Бармоқ жароҳатлари бошқа тафсилотлар (велотравма, ўткир предметлар таъсири ва бошқалар.) 0,9 дан 2,7% гачани ташкил этди.

Фалангалар синиши кўпинча V ва III бармоқларда, кейин I ва IV бармоқларда ва II бармоқда кузатилган. Фалангалар кесимида деярли барча бармоқларда, учинчи бармоқдан ташқари, синиқлар асосий фалангаларда қайд этилди. Асосий фалангаларининг синишининг кўп учраши сабаби шундаки, тўмтоқ жисмларнинг бевосита таъсири пайтида, шунингдек қўл билан қаттиқ жисмни урганда, фалангаларнинг кафт суяклар билан биргаликда жароҳатланиши одатда бармоқларнинг ёзилган холатида юзага келади. III-чи бармоқ синишлари кўпинча ўрта ва тирноқ фалангаларида кузатилди, бу эҳтимол, бармоқнинг узунлиги ва фалангага шикаст етказувчи омилларнинг айнан шу соҳага бевосита таъсири билан боғлиқ. Бундан ташқари, учинчи бармоқнинг асосий фалангаси икки ён томондан ҳимояланган.

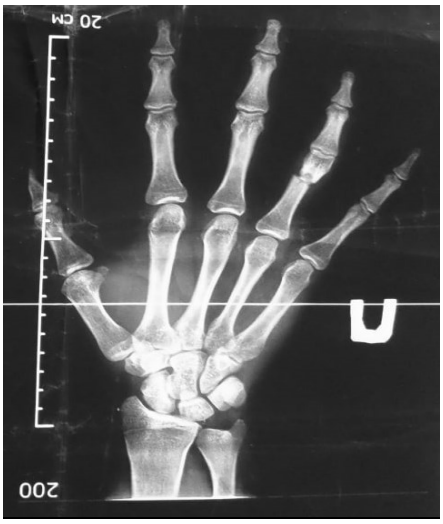
Фалангаларнинг синишлари кўпинча силжишсиз ва парчаланган бўлган. Қийшиқ ва кўндаланг синиқлар нисбатан кам учради. Айрим ҳолларда ампутацион синишлар ҳам мавжуд бўлди. Қийшиқ синиқлар асосан фалангалар дифизида кузатилган, бунда, синиқ бўлакларининг силжиши хос бўлиб, даволаш жарроҳлик усулида амалга оширилди. Мазкур ҳолатда юзалари катталиги ва қон айланишнинг яхши булиши сабабли, битиш жараёни

нисбатан тез ва асоратсиз кечди. Шунга кўра, мазкур ҳолатларда иммобилизация муддати 4-5 ҳафтани ва реабилитация даври 1 ойни ташкил этди. Силжишсиз синишлар I ва V- бармоқларнинг асосий фалангасида кузатилган бўлиб, беморлар консерватив даволанди ва асоратлар кузатилмади. Асосий фалангалар синишида иммобилизация муддати 5-7 ҳафтагачани ташкил этди ва 2 ой ичида меҳнат қобилияти тўлиқ тикланди. Парчаланган синишлар I-II бармоқларнинг асосий фалангаларида, шунингдек IV-V бармоқларнинг ўрта ва асосий фалангларида кузатилди. Тирноқ фалангаларида эса бундай синишлар кузатилмади. Барча ҳолатларда жарроҳлик усулида даволаш амалга оширилди ва кўпинча бўлакларнинг иккиламчи силжиши кузатилди. 5 нафар беморда операциядан кейинги даврда II-IV-V бармоқларнинг букилган контрактуралари келиб чиққан, букиш бурчаги 5-10^{o}да бўлиб, умумий меҳнат қобилиятининг турғун йўқотилиши 15-20%ни ташкил этди. 4 нафар беморда мураккаб бўғим ичи парчаланган синишларида, меҳнат қобилиятининг тикланиш билан боғлиқ, реабилитация давомийлиги 5 ойга қадарни ташкил этди, 1 нафар беморда бармоқда бўғим шакли бузилиши билан боғлиқ кучли ривожланган контрактура бир йилга қадар сақланиб қолди. Ушбу маълумотлар экспертлик амалиётида инобатга олиниши лозим. Кўндаланг синишлар I-IV бармоқлар тирноқ фалангаларида, шунингдек IV-чи бармоқнинг асосий (расм 6) фаланга соҳасида кузатилади. Барча беморлар консерватив даволанди. Айрим ҳолатларда IV-чи бармоқда ёзилган контрактура кузатилиб, букиш бурчаги 5^{0} ташкил этди. Бундай ҳолда, меҳнат қобилиятининг тикланиш муддати 3-4 ойни ташкил этди ва бир ойлик реабилитация давомида меҳнат қобилияти тўлиқ тикланди. Қолган ҳолларда иммобилизация муддати тирноқ фалангалари учун 3-4 ҳафтани, қолган фалангалар учун 5-7 ҳафтани ташкил этди.

Таҳлил натижалари шуни кўрсатадики, фалангалар синиқларнинг келиб чиқишида бевосита зарба таъсир механизми устунлик қилди, шунингдек буралиш ва сиқилиш (билвосита) ҳам фалангалар синишига олиб келиши қайд этилди.

Демак, бир ёки икки бармоқ фалангалари кесимида алохида қийшиқ ва силжишсиз синишларда оқибатни кутмасдан шикаст оғирлик даражаси ўрта даража этиб белгиланиши мумкин.

Травматик ампутациялар оғир тўмтоқ жисмлар билан бармоқларнинг босилиш натижасида жароҳатланган 3 нафар беморда қайд этилган. Барча ҳолатларда жароҳатларни жарроҳлик йўли билан даволаш ўз вақтида амалга оширилди. II-III бармоқлар тирноқ фалангалари ампутацияларида умумий меҳнат қобилиятини турғун йўқотиш ҳажми 5-10% ва IV- бармоқ ўрта фалангаси ампутациясида10-15% ни ташкил этди. Бир вақтнинг ўзида бир қўл панжасида бир нечта бармоқларнинг жарохатланиши, яъни 2-3 бармоқлар (ампутациялар) йўқотилиши билан кечганда, умумий меҳнат қобилиятининг турғун йўқотилиш ҳажми 25-30% дан 40-45 % гача кузатилди. Мазкур ҳолатларда жарохат уртача ва оғир даражали деб бахоланди.



6-расм. Кузатув № 191. Рентгенограмма, тўғри ва ён кўриниш, ўнг қўл панжаси, Э. 29 ёш. Қўлиги тумтоқ жимс билан урган. Ташхис: Ўнг қўл IV бармоқ асосий фалангасининг диафизидан ёпиқ кўндаланг синиб силжиши. Муддати 3 с. Узоқ оқибат- қониқарли.

Хулосалар:

1. Фалангаларда синишлар келиб чиқишида бевосита зарба таъсир механизми устунлик қилди, шунингдек буралиш ва қисилиш ҳам бу тузилмалар синишига олиб келиши қайд этилди. Умумий меҳнат қобилиятининг 5-10 %дан 15-20%гача миқдорда турғун йўқотилишига сабаб бўладиган бармоқ контрактуралари кўринишидаги асоратлар, фалангаларнинг кўндаланг ва парчаланган синиқларда кузатилди. Фалангаларнинг асоратланмаган синиқлари учун соғлиқнинг бузилиши давомийлиги 4-5 ҳафтадан 5-7 ҳафтагача, мураккаб асоратланган бўғим ичи синиқлари учун - 3-5 ой ва ундан кўпни ташкил этди;

2. Қўл - панжа суякларининг турли хил асоратланган ва асоратланмаган синишларининг оғирлик даражасини аниқлашнинг асосий мезонлари- соғлиқнинг бузилиши давомийлиги ва умумий меҳнат қобилиятнинг турғун равишда йўқотиш миқдори ҳисобланади. Қўл панжа ва бармоқ фалангаларининг очиқ оғир қўшма синишларида травматик шокнинг намоён бўлишини ҳам инобатга олиниши лозим.

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ПЕРСПЕКТИВЫ РАЗВИТИЯ НАЦИОНАЛЬНОЙ МОДЕЛИ КОРПОРАТИВНОГО УПРАВЛЕНИЯ

Аннотаци *В данной статье социальные аспекты оценки качества корпоративного управления в компаниях затрагивают социальную ответственность корпоративного управления перед собственными сотрудниками компании, клиентами, поставщиками и обществом в целом. Эффективное управление создает условия для создания комфортной рабочей среды, защиты прав работников, соблюдения стандартов безопасности и охраны труда, а также поддержания надежных отношений с заинтересованными сторонами.*

Ключевые слова*: корпоративное управление, эффективность, цели предприятия, производство, инновационная деятельность, компании, Наблюдательный совет, конкурентоспособность, качество управления.*

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PROSPECTS FOR THE DEVELOPMENT OF THE NATIONAL CORPORATE MANAGEMENT MODEL

Abstracts. *In this article, the social aspects of assessing the quality of corporate governance in companies address the social responsibility of corporate governance to the company's own employees, customers, suppliers, and society as a whole. Effective management creates conditions for creating a comfortable*

working environment, protecting employees' rights, adhering to safety and labor protection standards, and maintaining reliable relationships with stakeholders.

***Keywords**: corporate governance, efficiency, enterprise goals, production, innovation, companies, Supervisory Board, competitiveness, management quality.*

Введение

Социальные аспекты оценки качества корпоративного управления в компаниях корпоративное управление влияет на социальную ответственность компании перед своими сотрудниками, клиентами, поставщиками и обществом в целом. Хорошее управление создает основу для создания благоприятной рабочей среды, защиты прав работников, соблюдения стандартов безопасности и охраны труда, а также для поддержания доверительных отношений с заинтересованными сторонами.

Этические аспекты оценки качества корпоративного управления в компаниях напрямую связаны с качеством корпоративного управления, этическими принципами и ценностями компании. Прозрачность процессов, честность во взаимоотношениях с заинтересованными сторонами, соблюдение законодательства и деловой этики являются неотъемлемой частью успешного управления.

Все эти аспекты взаимосвязаны и определяют общее влияние корпоративного управления на экономическое развитие и социальную стабильность.

Анализ литературы по теме

Из опыта зарубежных стран известно, что корпоративное управление является основной структурой, определяющей социально-экономическое развитие страны, и в настоящее время совершенствуется в странах с развитой экономикой и развивающихся странах. Потому что развитие корпоративного сектора государства за счет внедрения передовых передовых практик требует от компаний уровня корпоративного управления, соответствующего международным стандартам.

Согласно исследованию организации экономического сотрудничества и развития (ОЭСР), “доля стран с преобладающей структурой собственности в мировой рыночной капитализации за последние годы превысила 20 процентов (1998-2002 гг.) До 34 процентов (2013-2015 гг.), во многом из-за резкого развития рынков капитала развивающихся стран. Поэтому качество корпоративного управления страной является решением для конкурентоспособности и динамичного развития ее корпоративного сектора

Методология исследования

В этой статье были использованы различные методы. Широко используются системные подходы, монографическое наблюдение, абстрактно-логическое мышление, сравнительный анализ, экспертная оценка, конструктивная оценка, методы прогнозирования, применяемые в повышении качества корпоративного управления в компаниях.

Анализ и результаты

Модели или системы корпоративного управления являются еще одной важной темой для научных дискуссий. Несмотря на то, что в различной литературе существуют разные взгляды на модели корпоративного управления, существуют мнения, что континентально-европейская и англосаксонская модели корпоративного управления являются двумя базовыми моделями, а остальные модели в определенном смысле вытекают из этих двух моделей. Например, исламская модель корпоративного управления (Islamic model) адаптирована к стейкхолдерской (континентальной европейской) модели, которая воплощает в себе лучшие практики англосаксонской модели и, самое главное, основана на принципах шариата. Структура методологии оценки качества корпоративного управления представлена на рисунке ниже. Также основными элементами оценки качества корпоративного управления в компании являются:

- собственность;
- прозрачность информации;
- структура управления и возможности общего собрания акционеров;
- механизм оплаты труда менеджеров;
- система мониторинга, контроля, идентификации и управления рисками;
- система корпоративной культуры.

Всемирно известная аудиторско-консалтинговая компания "Ernst & Young" (EY) провела исследование по практике оценки качества корпоративного управления в одной из швейцарских компаний, и в этом исследовании при определении стоимости собственного капитала использовалась модель финансовых активов с учетом вознаграждения за рисковые ситуации. Компания провела оценку стоимости заемного капитала с учетом корпоративных облигаций и кредитных спредов. Согласно результатам исследования, капитал корпоративных структур этой страны

Таблица 1
Качество корпоративного управления в акционерных обществах Швейцарии методы оценки[158]

Уровень доходности государственной облигации (уровень доходности швейцарской 10-летней государственной облигации)	a
Премия за глобальный риск	b
По методу практиков: бета = бета без левериджа* (1+долг/капитал)	d
Размер риска для уровня капитализации предприятия (Duff&Fhelps, данные руководства по оценке)	e
Оценка стоимости капитала (r)	g= a+ bxd+ e
Уровень доходности государственной облигации (уровень доходности швейцарской 10-летней государственной облигации)	h
Кредитный спред (показатель кредитного рейтинга)	i
Оценка стоимости заемного капитала (k)	k=h+i
Доля собственного капитала в структуре капитала	I
Доля заемного капитала в структуре капитала	m
Ставка корпоративного налога	n
Средневзвешенная стоимость капитала	gxI+kmx(1-n)

Система корпоративного управления Республики Узбекистан по форме аналогична немецкой модели. Это сходство проявляется в двухступенчатом совете, лидерстве банковской системы в финансировании. В то же время национальная система корпоративного управления имеет свои особенности. Например, в корпоративных структурах нашей страны рабочим и служащим не разрешается выдвигать или участвовать в Наблюдательном совете. В настоящее время 50% наблюдательных советов крупных немецких корпораций состоят из представителей рабочих и служащих. Кроме того, на рынке корпоративных финансов в нашей республике ограничены возможности эмитентов привлекать финансовые ресурсы через корпоративные облигации. В то время как значительная сложность и сложность условий выпуска корпоративных облигаций играет определенную роль, с другой стороны, слабое развитие вторичного рынка, низкая ликвидность фондового рынка и маржа для его обеспечения.

Выводы и предложения

Качество системы корпоративного управления в основном определяется функциями, выполняемыми элементами системы. Качество процессов корпоративного управления характеризуется мерой приближения к основной цели компании.

Факторами, влияющими на качество системы корпоративного управления компаний химической промышленности, входящих в

[158] Авторская разработка на основе данных

организационную структуру АО "Узкимёсаноат" и акционерного общества, являются снижение производственных затрат и себестоимости, а также внедрение современных энерго и ресурсосберегающих технологий и оборудования.

Широкое внедрение механизма повышения качества системы корпоративного управления служит повышению темпов роста производства продукции в химической промышленности.

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ИСПОЛЬЗОВАНИЕ КОМПЬЮТЕРНЫХ ПРОГРАММ В ЭФФЕКТИВНОМ ОБУЧЕНИИ ИНЖЕНЕРИИ И КОМПЬЮТЕРНОЙ ГРАФИКЕ

Аннотация: *В современном развитии каждое направление развивается стремительно. В том числе одной из важнейших дисциплин для подготовки технических инженеров является «Инженерная и компьютерная графика». Однако, существует необходимость внедрения современных инновационных подходов и методов, которые являются более эффективными и более выгодными, чем традиционное обучение по дисциплине инженерная графика. При обучении инженерной графике на основе сочетания трехмерного моделирования традиционным способом.*

Ключевые слова: *среда AutoCAD и Publisher. образовательная система, компьютерное обучение, инженерная графика.*

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USING COMPUTER PROGRAMS IN EFFECTIVE TEACHING OF ENGINEERING AND COMPUTER GRAPHICS

Abstract: *In modern development, each direction is developing rapidly. Including one of the most important disciplines for training technical engineers is "Engineering and computer graphics". However, there is a need to introduce modern innovative approaches and methods that are more effective and more profitable than traditional training in the discipline of engineering graphics. When teaching engineering graphics based on a combination of three-dimensional modeling in the traditional way.*

Keywords: *AutoCAD and Publisher environment. educational system, computer training, engineering graphics.*

Введение. Технические требования производства обуславливают актуальность подготовки специалистов во всех отраслях промышленности, отвечающих высоким требованиям к инженерам. Поэтому профессиональное образование и обучение по техническим специальностям должно развиваться вместе с национальной социальной экономикой, при этом, конечно, спрос на специалистов постоянно растет. Инженерные инновации, профессиональные и образовательные инновации и требования к ним — новейшие образовательные подходы, компьютерные технологии и интеллектуальные технологии — все это в настоящее время развивается. Это требует использования компьютерной среды, повышает качество подготовки специалистов всех технических направлений и способствует инновационным образовательным программам. Кроме того, компьютерные технологии создают возможность для студента организовать собственную последовательную и индивидуальную работу, а современные технологии также позволяют организовать виртуальное международное общение, что способствует повышению качества обучения и подготовке хороших кадров.

Устройства компьютерных технологий, опыт компьютерных технологий и необходимые условия для приобретения навыков в технологиях будущей профессиональной практики. В настоящее время образовательные программы реализуются с использованием активных методов обучения, которые дают хорошие результаты. В активном обучении есть методы discovery learning, смешанного обучения и т. д. Реализация таких инновационных подходов к образованию создает возможность для студентов самостоятельно достигать поставленных целей, что помогает им осваивать навыки, необходимые для их будущей профессиональной деятельности. Для обеспечения высококвалифицированного образования инженера-техника в образовательную программу специалиста должны быть включены фундаментальные, естественнонаучные, математические и инженерные дисциплины.

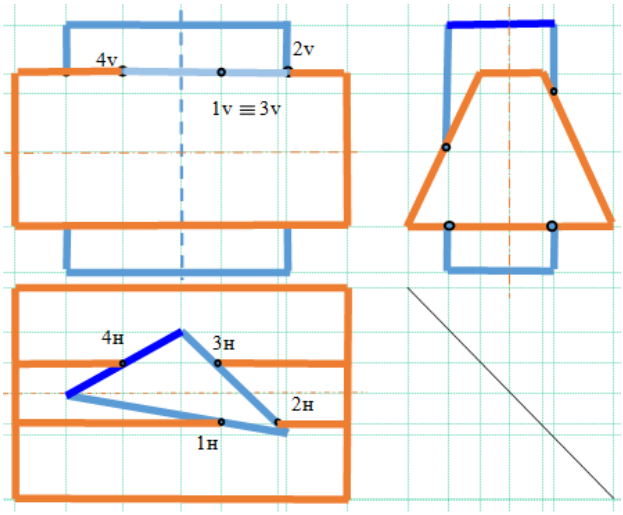
Одной из основных тем подготовки специалистов технических направлений является «инженерная и компьютерная графика», в которой основной целью является изучение правил геометрического построения, построение фигур на плоскости и в пространстве, развитие таких навыков, как воображение. В образовательный процесс внедряются современные инновационные методы и подходы к обучению графическому инжинирингу, информационным технологиям, что позволяет студентам значительно повысить углубленные знания учебного материала. Темы графической геометрии — это изучение различных методов создания изображений пространственных фигур на плоскости и методов решения геометрических задач по заданным чертежам этих фигур. Человеку, не умеющему читать и разрабатывать графический чертеж, нарисованный на бумаге, сложно это осмысленно делать на компьютере. Графическая геометрия преподается по каким-либо алгоритмам, требованию создания пространственных моделей, предъявлению преподавателем плакатов и рисунков на доске.

Современное состояние компьютерной техники в учебном процессе позволяет студентам активно участвовать в учебном процессе, самостоятельно создавая иллюстрации к изучаемому материалу. Эффективность использования компьютера, безусловно, зависит от знания базовой теории чертежей и умения использовать их при построении на этапе программного обеспечения и решении практических задач.

Также следует отметить, что для грамотного выполнения курсовых и дипломных проектов аспирантам необходимы навыки работы с компьютерной и инженерной графикой. Это определяет актуальность эффективного изучения данной учебной дисциплины. Кроме того, в процессе выполнения задания по инженерной графике студенты приобретают навыки создания чертежей, создания электронных моделей деталей в AutoCAD, работы с необходимыми справочниками в других компьютерных средах.

Экспериментальное исследование, направленное на развитие пространственного мышления, показало важность пространственного зрения с точки зрения инженерного образования. Стоит оценить эти способности с психологической точки зрения и выявить способы концентрации внимания студентов на развитии наиболее важных для будущих инженеров навыков.

- пространственная визуализация предстоящей графической работы;
- рисование рисунка от руки (в виде эскиза);
- понимание взаимосвязи (анализа) ортогональных и аксонометрических видов. важно отметить наличие навыков компьютерного моделирования. Поэтому, помимо пространственной визуализации и мышления, студентам важно знать методы решения задач изучаемого предмета графической геометрии на основе алгоритмов.



Графическая работа 1. Пересечение двух многоугольников.

Знать основные правила геометрического построения и ситуации пересечения плоских и пространственных моделей.

Воспринимать оптимальное соотношение частей и целого вида на основе графических моделей и выражать форму предметов и их взаимное расположение в пространстве. Усвоить сведения о способах проецирования и отражения пространственных форм. На данном чертеже в программе «Publisher» определено пересечение вертикально расположенной треугольной призмы и призматической фигуры.

Обсуждения. В результате проделанной работы по следующему вопросу студенты получают разный опыт в зависимости от уровня своих знаний. Кроме того, следует отметить, что время, затрачиваемое на выполнение одной и той же работы, существенно отличается друг от друга. То есть учитывается экономия времени студентов, работающих на бумаге и использующих компьютерный подход. Но главный вопрос зависит от компьютерных навыков студента. Помимо AutoCAD, чертежи проще создавать в программе Publisher, которая предоставляет возможность выполнять задания с точками, прямыми, плоскостями и многоугольниками.

Результаты Опыт показал, что комбинированный способ выполнения работы дал наилучший результат, поэтому наиболее эффективным является подход к работе в компьютерной программе, а затем, имея представление об объекте проектирования, легче справиться с его построением на бумаге. Благодаря этому способу студент заранее может представить себе модель детали и его будет проще вычертить на листе. Но могут быть случаи, когда студенту проще работать вручную. В этом случае выбор метода также однозначен. Поэтому очень важно сочетать традиционные и компьютерные технологии вместе. Компьютерные технологии упрощают некоторые виды рутинной работы по черчению геометрии в классе, а также способствуют реализации творческого потенциала учащихся, предоставляя им возможность реализовывать свои идеи с использованием современных технологий.

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ИНСТИТУТ АДВОКАТСКОЙ ТАЙНЫ В РОССИЙСКОЙ ФЕДЕРАЦИИ. ТЕОРИТЕКО-ПРАВОВОЙ АСПЕКТ

Аннотация. *В статье рассматривается понятие и правовое закрепление адвокатской тайны. Рассматриваются проблемы, возникающие при осуществлении адвокатской деятельности, связанной со сведениями, содержащими адвокатскую тайну.*

Ключевые слова: *адвокатская деятельность, адвокатура, адвокат, адвокатская тайна, сведения, доверитель, защита.*

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Annotation. *The article discusses the concept and legal consolidation of attorney-client privilege. The problems that arise in the practice of law related to information containing attorney-client privilege are considered.*

Key words: *advocacy, advocacy, lawyer, attorney-client privilege, information, the principal, protection.*

В настоящее время одним из главных вопросов, интересующих юридическое сообщество, является адвокатская тайна. Данный институт представляет собой существенное условие реализации права каждого на получение квалифицированной юридической помощи, гарантированное статьей 48 Конституции Российской Федерации.[1]

Согласно статье 1 Федерального закона от 31.05.2002 №63-ФЗ «Об адвокатской деятельности и адвокатуре в Российской Федерации» адвокатской деятельностью является квалифицированная юридическая

помощь, оказываемая на профессиональной основе лицами, получившими статус адвоката.[2]

Одной из основных особенностей адвокатской деятельности является адвокатская тайна. Развитие института адвокатской тайны определяет качество оказания юридической помощи. Важной составляющей отношений между адвокатом и доверителем является доверие, наличие которого невозможно без сохранения конфиденциальности.

Формируя исследовательскую линию, считаем необходимым обратиться к содержанию понятия адвокатской тайны, разработанного доктриной российского права. Так, например, Смирнов В.Н. считает, что адвокатская тайна – это любая информация, полученная адвокатом от граждан либо организаций при обращении к нему по поводу оказания юридической помощи.[4]

Смоленский М.Б. писал: «Сферу сведений, охватываемых словосочетанием «адвокатская тайна», можно определить так: вся информация, предоставленная адвокату клиентом или полученная им относительно клиента либо других лиц в ходе предоставления юридических услуг.»[5]

В Российском законодательстве понятие адвокатской тайны закреплено в статье 8 Федерального закона от 31.05.2002 №63-ФЗ «Об адвокатской деятельности и адвокатуре в Российской Федерации». Адвокатской тайной являются любые сведения, связанные с оказанием адвокатом юридической помощи своему доверителю.[2]

Также упоминание о данном понятии содержит Кодекс профессиональной этики адвоката.[3] Так, профессиональная тайна адвоката (адвокатская тайна) обеспечивает иммунитет доверителя, предоставленный последнему Конституцией Российской Федерации.

Предмет адвокатской тайны указан в самом определении данного понятия. Предметом являются любые сведения, полученные адвокатом за время оказания юридической помощи.

В ходе осуществления своей деятельности, адвокат может получать аудио- и видеозаписи, информацию на электронных носителях, личные записи доверителя. Данные сведения, а также сведения, полученные в закрытых судебных заседаниях, также охраняются адвокатской тайной.

Особенностью адвокатской тайны является отсутствие временного ограничения. Это означает, что адвокат не вправе разглашать сведения, полученные от доверителя, даже после прекращения сотрудничества. В случае приостановления или прекращения статуса, адвокат не имеет права разглашать сведения, полученные им ранее.

Кроме того, следует различать момент возникновения адвокатской тайны. Адвокатская тайна возникает в момент обращения за юридической помощью. Например, за помощью обратились родственники, но не заключили соглашение. Позже за помощью гражданин обратился самостоятельно. Факт обращения родственников, все сведения и документы, полученные во время

консультации, с момента обращения являются адвокатской тайной и не подлежат разглашению.

К предмету (содержанию) адвокатской тайны относятся:

– факт обращения к адвокату, включая имена и названия доверителей;

– все доказательства и документы, собранные адвокатом в ходе подготовки к делу;

– сведения, полученные адвокатом от доверителей и документы, если они входят в производство по делу;

– информация о доверителе, ставшая известной адвокату в процессе оказания юридической помощи;

– содержание правовых советов, данных непосредственно доверителю или ему предназначенных;

– адвокатское производство по делу;

– условия соглашения об оказании юридической помощи, включая денежные расчеты между адвокатом и доверителем;

– любые другие сведения, связанные с оказанием адвокатом юридической помощи.[3]

Смоленский М.Б. писал: «Кроме требований закона о сохранении в тайне сведений, составляющих адвокатскую тайну, определенным стимулом к обеспечению их сохранности для адвокатов является природа их профессиональной деятельности. В зависимость от умения сохранять в тайне сведения поставлена их способность выигрывать дела, т.е. успех в защите интересов клиента, иными словами, профессиональная пригодность и профессиональный рейтинг. К тому же объем сообщаемых клиентом сведений зависит от уровня доверия, который испытывает он к избранному адвокату, а от этого зависит благополучие адвоката, т.е. хранить адвокатскую тайну выгодно.»[5]

При осуществлении своей профессиональной деятельности адвокаты часто сталкиваются с противоречием норм права. Так, нередко адвокаты оказываются в ситуации, где с одной стороны, они обязаны соблюдать адвокатскую тайну, а с другой стороны, есть требования суда, правоохранительных или налоговых органов, которые имеют право на получение информации.

Так, согласно налоговому законодательству, адвокаты обязаны предоставлять сведения о своих доходах, а также уплачивать установленный налог. В свою очередь налоговый орган вправе требовать у адвокатов предоставления документов, необходимых для исчисления и уплаты налогов.

В данном случае налоговые органы вправе требовать от адвокатов и адвокатских образований предоставления сведений, которые необходимы для оценки налоговых последствий сделок, заключаемых с клиентами, но не вправе требовать предоставления сведений, которые связаны с содержанием оказываемой адвокатами юридической помощи и могут быть использованы против их клиентов.

В настоящее время на законодательном уровне не закреплено, кто должен разрешать возникающие между адвокатами (адвокатскими образованиям) и налоговыми органами споры о том, содержат ли документы, запрашиваемые налоговым органом, сведения, являющиеся предметом адвокатской тайны.

Подводя итоги, стоит отметить, что институт адвокатской тайны – это одно из необходимых условий существования и функционирования института адвокатуры. Без должных гарантий обеспечения адвокатской тайны утратит свое значение право на защиту.

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JIGAR SERROZINI ANIQLASH VA DAVOLASH

Annatatsiya: *Surunkali jigar kasalligi (CLD) e'tiborga olinmagan epidemiyadir. Erta o'lim ko'p va O'zbekistonda jigar kasalliklari yurak va nafas olish kasalliklari bilan bir qatorda adolatsiz sog'liqni saqlash bo'yicha birinchi uchlikka kiradi. CLD bilan og'rigan bemorlarning 50 foizi shoshilinch tibbiy yordamdan so'ng birinchi marta sirroz tashxisi qo'yiladi, bu esa bemorning yomon natijalariga olib keladi. An'anaviy parvarish modellari ehtiyoj jamiyat darajasida bo'lganda ikkinchi darajali yordamga asoslangan. Bemorlarni jamiyatdagi populyatsiya darajasidagi xavf omillari asosida kasallik mavjudligini tekshirish, potentsial reversivlik mavjud bo'lganda, uning mavjudligini erta aniqlash imkonini beradi. Ushbu sohada klinik yordamni yaxshilash uchun uchta keng yo'nalishda innovatsiyalar zarur: jamiyatda diagnostikadan foydalanishni yaxshilash, diagnostikani birlamchi va ikkinchi darajali tibbiy yordamga integratsiyalash va bemorlarga yordam ko'rsatishni yaxshilash uchun raqamli sog'liqni saqlashdan foydalanish. Ushbu maqolada biz O'zbekiston tadqiqot va innovatsiyalari tomonidan moliyalashtirilgan jigar kasalliklarini erta aniqlash uchun integratsiyalashgan diagnostika (ID-LIVER) loyihasi O'zbekistonda jigar kasalliklarini aniqlash masalasiga aholi darajasida yondashish uchun yechimlarni qanday ishlab chiqayotganini tasvirlab beramiz. NHS tashkilotlari, akademik hamkorlar va tijorat tashkilotlarini birlashtirib, ilgari Nottingemda tashkil etilgan innovatsion yo'llarga asoslanishdir.*

Maqsadi *- o'sishni rag'batlantirish va hozirda yetarli bo'lmagan modelni buzish uchun ilg'or ma'lumotlar ilmi orqali multimodal diagnostikani birlashtirgan tijorat yechimini birgalikda yaratish va amalga oshirish. Bu NHS doirasida aholi darajasida jigar kasalliklarini erta tashxislash va stratifikatsiya qilish uchun keng ko'lamda qo'llanilishini maqsadli ko'rishdir.*

Kalit so'zlar*: jigar kasalligi, tashxis, yo'l, amalga oshirish, jamoa, sun'iy intellekt*

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DETERMINATION AND TREATMENT OF LIVER SERROSIS

Annatation: *Chronic liver disease (CLD) is an overlooked epidemic. Premature mortality is high, and liver disease ranks among the top three health inequities in Uzbekistan, along with heart and respiratory diseases. 50% of patients with CLD are first diagnosed with cirrhosis after emergency care, leading to poor patient outcomes. Traditional models of care rely on secondary care when the need is at the community level. Screening patients for the presence of the disease based on population-level risk factors in the community allows for early detection of its presence when there is potential reversibility. Innovation in this area is needed in three broad areas to improve clinical care: improving the use of diagnostics in the community, integrating diagnostics into primary and secondary care, and using digital health to improve patient care. In this article, we describe how the Integrated Diagnostics for Early Detection of Liver Disease (ID-LIVER) project, funded by the Uzbek Research and Innovation, is developing solutions for a population-based approach to liver disease detection in Uzbekistan. It is building on the innovative pathways previously established in Nottingham, bringing together NHS organisations, academic partners and commercial organisations.*

The aim is to jointly develop and implement a commercial solution that integrates multimodal diagnostics through advanced data science to drive growth and disrupt the current under-resourced model. This is aimed at seeing widespread use for early diagnosis and stratification of liver disease at a population level within the NHS.

Keywords: *liver disease, diagnosis, pathway, implementation, team, artificial intelligence*

Jigar kasalligi butun dunyo bo'ylab salomatlik uchun jiddiy yuk bo'lib, O’zbekistonda o'lim va kasallanishning asosiy sababi sifatida tan olingan. 2011 yilda birinchi marta qo'shni Yevropada o'lim darajasi yaxshilanganiga qaramay, Angliyada jigar kasalliklaridan o'lim ko'payishi davom etayotgani ta'kidlangan (1). O’zbekistonda bu o'limning eng ko'p beshinchi sababidir va 1970 yildan beri jigar kasalliklari uchun standartlashtirilgan o'lim darajasi boshqa asosiy kasalliklar uchun o'lim darajasining yaxshilanishidan farqli o'laroq 400% ga oshgan (2). Bundan tashqari, O’zbekistonda jigar kasalligi 30-49 yosh guruhida o'limning asosiy sababidir (3).

Turmush tarzi bilan bog'liq jigar kasalliklarining tarqalishi so'nggi o'n yil ichida alkogolsiz yog'li jigar kasalligi (NAFLD) kabi kasalliklarning tarqalishi bilan o'sib bordi, bu kasallik spektri bo'lib, unda jigar hujayralarida yog' miqdori ko'payib, ~20-20 gacha baholanadi. Dunyo bo'ylab 30% (4). O'z vaqtida tashxis qo'yish xulq-atvor aralashuvi bilan erta jigar fibrozining potentsial tiklanishini amalga oshiradi; Jigar kasalliklarining 90% turmush tarzi bilan bog'liq (5). Bemorlarning 50% ga yaqinida faqat kasalxonaga shoshilinch yotqizilganidan keyin jigar kasalligi tashxisi qo'yiladi (6). Jigar kasalliklari tengsiz tibbiy yordam ko'rsatish bo'yicha birinchi uch o'rinda (7); Surunkali jigar kasalligi (CLD) bilan og'rigan odamlarning o'rtacha o'lim yoshi eng kam ta'minlangan O’zbekistonda yashovchilarda 9 yilga farq qiladi (8). Bundan tashqari, COVID-19 pandemiyasi CLDga nomutanosib ta'sir ko'rsatadi;

15 000 kasalxonaga yotqizilgan bemorlarni o'rganishda o'lim xavfi (xavf darajasi 1,5) barcha surunkali kasalliklarning eng yuqori darajasi edi (9).

Ilg'or kasalliklarni aniqlashda yaxshi bo'lsa-da, hozirda bitta diagnostika testi mavjud emas yoki erta jigar kasalliklarini ishonchli aniqlash va qatlamlash uchun yetarli. An'anaviy ravishda jigar kasalligi mavjudligini aniqlash uchun "jigar funktsiyasi testlari" (LFT) deb ataladigan qon testlari to'plami o'tkaziladi. Bularga jigar shikastlanganda mavjud bo'lgan fermentlar va molekulalar kiradi. Ushbu testlar tez-tez so'raladi, lekin ko'pincha jigar kasalligini aniqlamaydi; LFTlarning 20% gacha g'ayritabiiy natija bor, ammo bu bemorlarning faqat 1,26% keyinchalik surunkali jigar kasalligi tashxisi qo'yilgan (10). Aksincha, jigar qon testlari og'ir jigar kasalligi bo'lgan odamlarning 90% gacha normal bo'lishi mumkin (11).

Bemorning jamiyatda jigar kasalligiga chalinish ehtimolini baholashning boshqa usullari klinik amaliyotda keng qo'llaniladigan bemorning qon tekshiruvi natijalari va yoshiga asoslangan FIB4 balli kabi noinvaziv skoring tizimlarini o'z ichiga oladi (12). Kengaytirilgan jigar fibrozi (ELF) testi jigar fibrozining mavjudligini bashorat qilish uchun ishlatilishi mumkin, ammo Buyuk Britaniyada bu testning mavjudligi har xil (13). Fibroskan - bu ixtisoslashgan ultratovush tekshiruvi bo'lib, u jigarda chandiq yoki fibroz darajasini sonli baholash imkonini beradi.

O’zbekistonda jigar kasalligini erta aniqlash NHS klinisyenlari, akademiklar va diagnostika va sun'iy intellekt (AI) sohalari rahbarlaridan tashkil topgan Jigar kasalliklarini erta aniqlash bo'yicha integratsiyalashgan diagnostika (ID-LIVER) konsortsiumi erta jigar kasalliklarini aniqlash uchun yechimlarni ishlab chiqish uchun birgalikda ishlamoqda. Biz erta jigar kasalliklarini aniqlashni yaxshilashga ishongan uchta bo'shliqni aniqladik. Birinchi muhim bo'shliq - bu erta aralashuv farq qiladigan bosqichda jigar kasalligini qanday aniqlashni yaxshilashdir. Ikkinchi muhim bo'shliq - bu diagnostika va boshlang'ich boshqaruvni kasalxonaga asoslangan tibbiy yordamdan jamoaviy yordamga o'tkazish. Uchinchi muhim bo'shliq - tarixiy ehtiyojlarga emas, balki ob'ektiv ma'lumotlarga asoslangan holda diagnostika va zarurat joylariga aralashuvga e'tibor qaratishdir. Bizning farazimiz shundan iboratki, NHSda klinik yo'lni amalga oshirish uchun zarur bo'lgan tajriba bilan birlashtirilgan innovatsion yondashuv ushbu uchta ehtiyojni qondirishga yordam beradi. Yondashuvimizning yangiligi ham tarmoqlararo hamkorlikni, ham keng intizomiy jalb qilishni o'z ichiga oladi; NHS, ikkita yirik universitet va sanoatni qamrab oluvchi hamkorlarning xilma-xilligi bilan ta'kidlangan. Maqsad - birlamchi va ikkinchi darajali tibbiy yordamning an'anaviy chegaralarini kesib o'tuvchi iterativ va integratsiyalashgan yechimga ega bo'lish. Jigar kasalliklarining og'irligiga qarshi kurashish bo'yicha kompleks strategiya zarurligi birinchi marta 2011 yilda milliy darajada ta'kidlangan va kun tartibidagi birinchi ustuvor vazifalar jigar kasalliklarini erta aniqlashni kuchaytirishdan iborat (1, 2). Hozirgi vaqtda ko'pgina Buyuk Britaniya sog'liqni saqlash muassasalarida jigar kasalliklarini tashxislash va davolashning rasmiy usullari mavjud emas. Amerika jigar kasalliklarini o'rganish assotsiatsiyasi va jigar kasalliklarini o'rganish bo'yicha Yevropa assotsiatsiyasi (14, 15) tomonidan umumiy aholini jigar kasalliklari uchun

skrining tekshiruvi tavsiya etilmaydi. Umumiy aholi orasida jigar kasalliklarini erta tashxislashga qaratilgan mahalliy tashabbuslar O’zbekiston bo'ylab heterojen yondashuvlar bilan amalga oshirildi. Quyida uchta o'rnatilgan yondashuv muhokama qilinadi.

O’zbekistonda Scarred Liver Project (SLP) ishga tushirilgan yo'lni o'rnatdi, unda umumiy amaliyot shifokori (GP) xavf omillari asosida CLD uchun skrining uchun bemorlarni aniqlaydi. 2013 yilda o'tkazilgan dastlabki tajriba tadqiqotlari CLD uchun xavf omillariga qaratilgan va bu yo'l metabolik va alkogol bilan bog'liq kasallikning etiologiyalariga ham tegishli (11, 16). Fibroskan natijalariga ko'ra, CLD xavfi yuqori bo'lgan bemorlar ikkinchi darajali tibbiy yordamda qo'shimcha tekshiruvlardan o'tadilar, past xavfli bemorlar esa turmush tarzi bo'yicha maslahatlar bilan chiqariladi. Oddiy parvarishlash standartiga nisbatan diagnostik samaradorlik va iqtisodiy samaradorlikka ega ekanligi ko'rsatilgan (17, 18).

Ishlab chiqilgan yana bir yondashuv "refleks" test usulidan foydalanish bo'lib, agar dastlabki skrining natijasi anormal bo'lsa, keyingi sinovlar boshlanadi. Dillon va boshqalar. Shotlandiyaning Dandi shahrida boshlangan "Intelligent LFTs" (iLFTs) yo'lini tasvirlab berdi, bu yerda g'ayritabiiy LFT natijalari keyingi qon tekshiruvlarining refleksli kaskadiga olib keldi. Keyinchalik bu natijalarga asoslangan diagnostika va boshqaruv bo'yicha maslahatlar GPga beriladi (19). ILFTs yo'li anormal jigar qon testlarining 75% birlamchi tibbiy yordamni boshqarishga imkon berishi ko'rsatilgan (20). Refleks tekshiruvi Uelsning Gvent mintaqasida ham qo'llanilgan, bunda aspartat aminotransferaza (AST) va alanin aminotransferaza (ALT) ning anormal ALTdan so'ng LFT natijalari nisbati avtomatik hisoblab chiqiladi, bu esa jigar sirrozi bilan og'rigan bemorlarni aniqlashning ko'payishiga olib keldi. jamoa muhiti (21).

O’zbekistonning hududlarida ikki bosqichli tabaqalanish yo'llari tashkil etilgan va muntazam klinik yordam sifatida qabul qilingan. Ikki bosqichli yo'lga misol Shimoliy Londonda Srivastava va boshqalar. NAFLD klinik tashxisi yoki g'ayritabiiy ALT bo'lgan bemorlarni tabaqalash uchun FIB4 skoring va ELF testidan foydalangan holda "NAFLD yo'li" ni qo'ying (22). Yangi yoki aniqlangan NAFLD tashxisi bo'lgan bemorlar dasturda ishtirok etishlari mumkin va dastlabki FIB4 natijalariga ko'ra bemorlar past xavf, noaniq xavf yoki rivojlangan jigar fibrozisi xavfi yuqori bo'lganlar uchun qatlamlarga bo'linadi. Keyinchalik, sirrozni aniqlash darajasi standart davolash yo'lidagilarga nisbatan uch baravar ko'payganligi xabar qilindi.

Uchta alohida yo'l individual kuchli va zaif tomonlarga ega. Misol uchun, anormal jigar fermentlari bilan boshlash kasallikni o'tkazib yuborishi mumkin va xavf omillariga e'tibor qaratish, hatto uzoq muddatli tejash amalga oshirilsa ham, qisqa muddatda resurslarga qiyinchilik tug'diradi. Ushbu yo'llarni takrorlash va rivojlantirish qobiliyati tez dinamik NHS landshaftida muhim ahamiyatga ega bo'ladi. Yaralangan jigar loyihasidan olingan saboqlar

Ilgari sifatida, SLP kelajakdagi yo'lni, shu jumladan ID-LIVER loyihasini amalga oshirish uchun muhim manbadir.

Birlamchi va ikkinchi darajali tibbiy yordam o'rtasidagi hamkorlik SLP muvaffaqiyati uchun juda muhim edi. Prezident jamg'armasining 2019 yilda "NHSda innovatsiyalarni qabul qilish va tarqatish" hisobotida ta'riflanganidek, birlamchi va o'rta tibbiy yordamda katta klinik chempionlarning mavjudligi nafaqat yo'lni birgalikda ishlab chiqarishga imkon berdi, balki manfaatdor tomonlarni o'qitish va muammolarni hal qilishda muhim ahamiyatga ega edi. amalga oshirish jarayonida yuzaga kelgan muqarrar muammolar (23). Birlamchi va ikkinchi darajali manfaatdor tomonlarning umumiy egalik tuyg'usi amalga oshirish muammolarini tezkor hal qilishga yordam berdi va ishtirokchilar o'rtasidagi nizolarning oldini oldi.

Loyihani turli geografik joylarda amalga oshirishda ataylab tajriba bosqichiga ega bo'lish salohiyatni boshqarish va muammolarni erta aniqlashda muhim edi. Ushbu ko'p bosqichli jarayon birlamchi tibbiy yordam va jarayonning har bir bosqichida doimiy moliyalashtirishni qo'lga kiritish uchun klinik chempionlarning uzoq muddatli majburiyatlari, faol ishtiroki va muzokaralarini talab qildi. Loyiha uchun asosiy to'siq operatsion siloslar ichida joylashgan moliyaviy byudjetlarga asoslangan edi. Uzoq muddatli sog'liqni saqlash iqtisodiy dalillari komissarlar tomonidan tushunildi, ammo ular qisqa muddatli yillik byudjetlarga e'tibor qaratish bilan cheklandi. Shunga o'xshash muammolar ko'plab innovatsion hisobotlarda, jumladan Prezident jamg'armasi hisobotida ta'kidlangan, klinik yordamga o'tish uchun mablag' ko'pincha innovatsiyalarni muvaffaqiyatli yetkazib berish uchun asosiy to'siq sifatida tilga olinadi (23).

SLPning dastlabki tadqiqotlari turli geografik va ijtimoiy-etnik hududlarda o'tkazildi va fizibilite, jalb qilish va kasalliklarni aniqlash o'xshashligini ko'rsatdi. Biroq, topshirilgan yo'lni baholashda ma'lum bo'ldiki, murojaatlarning 30% atigi 5% amaliyotdan kelib chiqqan (Guha va boshq., Ichki audit - nashr etilmagan). Ushbu amaliyotlar kasalliklarning eng yuqori tarqalgan hududlariga asoslanmagan va bu an'anaviy ravishda "erish qiyin" guruhlarga (kasallik xususiyatlari va ijtimoiy-etnik omillarni o'z ichiga olgan holda) maxsus yechimlarga muhtoj bo'lishi mumkinligini ta'kidladi. Ushbu o'rganish jigar bilan bog'liq kasalliklar va o'lim darajasi yuqori bo'lgan hududlarni yo'naltirish zarurligini hisobga olgan holda ID-LIVER dasturiga o'tkazildi.

Hayot tarzi bilan bog'liq xavf omillarining ko'payishi bilan o'zgaruvchan talab bilan resurslarni moslashtirish asosiy to'siq bo'ldi. Samarali triaj testlarini topish, ayniqsa normal jigar fermenti testlari kontekstida, qiyin bo'ldi. Shunday qilib, diagnostika yo'lini nozik sozlash zarurati aniq; Kelgusi iteratsiyalarda yangi testlar yoki gipotezasiz yondashuvlarni (masalan, mashinani o'rganish texnikasi) o'rganish jozibador yondashuvdir.

Sog'liqni saqlash texnologiyalarini faol joriy etish

ID-LIVER loyihasi

Jigar kasalliklarini erta aniqlash uchun integratsiyalashgan diagnostika yoki ID-LIVER - bu erta jigar kasalliklarini aniqlashga qaratilgan yangi konsortsium. Biz klinik jihatdan ahamiyatli kasallikka o'tish xavfi yuqori bo'lgan bemorlarni aniqlash modelini ishlab chiqish uchun bir nechta manbalardan olingan bemor va diagnostika ma'lumotlarini birlashtirish uchun mashinani o'rganish algoritmlaridan

foydalanishni maqsad qilganmiz. Keyinchalik, ushbu shaxslar sog'liqni saqlash natijalari va xarajatlarini yaxshilash potentsiali bilan ushbu xavfni kamaytirish uchun aralashuvga yo'naltirilishi mumkin. Loyiha Buyuk Britaniya hukumatining Innovate UK Industrial Strategy Challenge fondi tomonidan moliyalashtiriladi, u 2,5 million funt sterling beradi va sanoat hamkorlari tomonidan 2 million funt sterlingga teng naqd pul ajratadi. U Manchester universiteti klinik va akademik hamkasblari, Manchester universiteti NHS Foundation Trust, Nottingem universiteti va Nottingem universiteti kasalxonalari NHS Trust, shuningdek, yirik sanoat hamkorlari GE Healthcare va Roche Diagnostics o'rtasidagi hamkorlikni ifodalaydi.

O’zbekistonning shimoli-g'arbiy jigar kasalliklarining tarqalishi bo'yicha eng yuqori o'rinlardan birini egallaydi, bunda kattalar aholisining 30% gacha jigar kasalligi uchun xavf omillari mavjud (8). O’zbekistonda bu jigar kasalligi xavfi ostida bo'lgan bir million odamga to'g'ri keladi, bu aholi darajasidagi diagnostika echimlariga bo'lgan ehtiyojni ta'kidlaydi. Yaqinda O’zbekiston sog'liqni saqlash va ijtimoiy yordamni o'zgartirdi va 2015 yilda 37 ta NHS organlari va o'nta tuman O’zbekiston sog'liqni saqlash va ijtimoiy yordamni nazorat qilish vakolatiga ega bo'lgan birinchi mintaqa sifatida O’zbekiston sog'liqni saqlash va ijtimoiy yordam bo'yicha hamkorlikni (GMHSCP) tashkil qilish uchun birlashdi. g'amxo'rlik byudjeti. Turli xil ijtimoiy-iqtisodiy kelib chiqishiga ega 2,8 million aholini qamrab olgan mintaqada maqsad sog'liqni saqlash va ijtimoiy yordamni sog'liqni saqlash natijalarini yaxshilash uchun birgalikda yo'naltirishdir.

O’zbekistonda tashkil etilgan klinik yordam yo'li Integrated Care System (ICS) va Primary Care Networks (PCNs) bilan hamkorlikda birlamchi va ikkinchi darajali tibbiy yordam ehtiyojlarini osonlashtiradigan yo'lni yaratish uchun ishlab chiqilgan. Jigarni baholashning yangi klinikalari birlamchi va ikkinchi darajali tibbiy yordamning an'anaviy paradigmasini xiralashtiradi. Komissiya a'zolarini erta jalb qilish va birlamchi va ikkinchi darajali tibbiy yordamda klinik chempionlarga ega bo'lish SLP (Scarred Liver Project dan olingan saboqlar bo'limi) muhim omillari edi. ID-LIVER jamoasi bemorning sayohatining har bir bosqichida, identifikatsiyadan to tergovgacha bo‘lgan omillarni faol ko‘rib chiqdi, ular nafaqat samaradorlikni oshiribgina qolmay, balki foydalanishning teng huquqliligini ham ta’minlaydi (Sog‘liqni saqlash xizmatlarini yetkazib berishning tengligini yaxshilash bo‘limi).

O'tkazilgan sog'liqni saqlash tizimida ishlash jamoaga an'anaviy sog'liqni saqlash tizimida tez-tez uchraydigan klinik ishga tushirish guruhlari (CCG) bilan solishtirganda, aholi salomatligi bilan bog'liq muammolar miqyosida jigar kasalligiga yondashish imkonini beradi. Ambitsiya shundan iboratki, bu SLP duch kelgan qisqa muddatli va silos byudjeti masalalariga potentsial yechim beradi.

Dastlabki uchuvchi bosqichning afzalliklari, SLPda ko'rinib turibdiki, klinikalarni tezkor, bosqichma-bosqich yo'lga qo'yish mexanizmini taqdim etadi. Ushbu iterativ yondashuv alohida saytlar va aholining noyob muammolarini tezda hal qilishni osonlashtiradi.

Sog'liqni saqlash xizmatlarining tengligini oshirish

Jigarni baholash klinikalari uchun klinik o'zaro ta'sirlarning geografik joylashuvi ID-LIVER uchun doimiy muhokama qilinmoqda. Sollis Clarity salomatlik tahlili platformasi bilan ishlashning maqsadi aholi salomatligi kontekstini tushunishdir. ICS va PCNs kabi birlamchi tibbiy yordam tashkilotlari bilan hamkorlikda biz jigar kasalliklari uchun xavf profillari geografik jihatdan kasallikning "issiqlik xaritalari" orqali qaerda joylashganligini tushunishni boshlashimiz mumkin va keyin ushbu hududlarda yangi jamoaviy jigarni baholash klinikalarini tashkil etishimiz mumkin. Klinikalar yuqori kasallik yuki, nomutanosib jigar o'limi yoki jigar bilan bog'liq natijalarga qarab joylashtirilishi mumkin. Bu yo'naltirishning noto'g'riligini bartaraf etishga va taqdim etilayotgan xizmatning tengligini yaxshilashga qaratilgan.

Bemor va jamoatchilikni jalb qilish tashkiloti Vocal bilan Manchesterda jigar kasalliklari uchun xavf omillari bo'lgan turli bemorlar guruhlari bilan ochiq munozaralar boshlandi. Bemorlarni loyihalashda "erish qiyin" bemorlar guruhlarini jalb qilish xizmatlardan foydalanish imkoniyatini oshirishga qaratilgan va tibbiy yordam ko'rsatishning tengligini yaxshilashning muhim qismidir.

Raqamli qidiruv vositalaridan foydalangan holda "xavf ostidagi" bemorlarni aniqlash

Joriy NHSda cheklangan resurslar bilan keyingi klinik tekshiruvlar uchun bemorni identifikatsiya qilish dolzarb masaladir. CLD uchun xavf omillari bo'lgan bemorlarni aniqlashni osonlashtirish uchun Shimoliy-G'arbiy EHEALTH kompaniyasining FARSITE (Sinov samaradorligini oshirish uchun fizibilite va ishga qabul qilish tizimi) texnologiyasidan foydalangan holda GP amaliyotlari skriningi amalga oshirilmoqda. Bu markazlashtirilgan tarzda boshqariladigan profillash vositasi bo‘lib, bemorda identifikatsiya qilinmagan yozuvlardan xavf omillari bor yoki yo‘qligini aniqlaydi. Jigar kasalliklari uchun xavf omillari bo'lgan barcha bemorlarga o'z yozuvlarida hujjatlashtirilgan holda to'g'ridan-to'g'ri GP yozma aloqa orqali murojaat qilish mumkin, bu GDPR qoidalariga javob beradigan yo'l dizaynini amalga oshirishda muhim omil hisoblanadi. Tanqidiy jihatdan, optimallashtirilgandan so'ng, ushbu texnologiya band bo'lgan klinik va ish yurituvchi xodimlardan juda kam ma'lumot talab qiladi va taklifnomalar tezligini individual baholash klinikasi imkoniyatlariga moslashtirish uchun nazorat qilish mumkin.

O’zbekistonning markaziy amaliyotlarini (~ 900 000 kishiga xizmat ko'rsatadigan) dastlabki qidiruvdan so'ng, FARSITE jigar kasalligi uchun hech qachon tekshirilmagan, uch yoki undan ortiq xavf omillari bo'lgan 2005 bemorni aniqladi. Yana 55 286 tasi jigar kasalligi uchun bir yoki bir nechta xavf omillariga ega. Bu hatto kichik geografik hududda ham tadqiqot uchun potentsial maqsadli aholi qanchalik muhimligini ko'rsatadi. Shunday qilib, loyiha, agar raqamli qidiruv vositalari tibbiy yordamning klinik yo'llariga birlashtirilishi mumkin bo'lsa, kontseptsiyani isbotlaydi. Muhimi, bu xavf omillari yukiga ega bo'lgan, ammo CLD uchun tabaqalashtirilmagan shaxslar va amaliyotlarda nomutanosiblik mavjud bo'lgan bemorlarni aniqlash mexanizmini ta'minlaydi.

Jigar kasalligi xavfi yuqori bo'lganlarga diagnostika xizmatlarini ko'rsatish

Jigar bilan bog'liq natijalarning eng katta xavfi bo'lgan shaxslarga resurslarni etkazib berishni optimallashtirish moliyaviy jihatdan cheklangan modelda juda muhimdir. Jigar kasalligi rivojlangan yoki erta kasallik va kasallikning rivojlanish xavfi yuqori bo'lganlarni aniqlash juda muhimdir. Biz buni hal qilish uchun AI yondashuvidan foydalanmoqdamiz, shunda tabaqalanish ilgari belgilangan yo'llarga qaraganda kengroq miqyosda amalga oshirilishi mumkin. Jiva.ai, sun'iy intellekt yordamida bashoratli tahlillarga ixtisoslashgan kompaniya bilan hamkorlikda biz klinik jihatdan ahamiyatli jigar kasalliklari xavfini bashorat qilish uchun algoritmik vositani ishlab chiqmoqdamiz. Taxminiy biomarkerlar istiqbolli tasdiqlanadi va AI modellashtirishga kiritiladi.

Klinisyenga kirish va qabul qilishni yaxshilash

Mamlakat bo'ylab bemorlarni qayd etishning ko'plab elektron tizimlari mavjud bo'lib, ular ko'pincha sog'liqni saqlash muassasalarida mavjud bo'lgan boshqa tizimlar bilan o'zaro ta'sir qilmaydi. Bemorni parvarish qilishda zarur bo'lgan bir nechta ma'lumotlar oqimini yig'ish va boshqarish ko'pincha qiyin. Ushbu muammoni hal qilish uchun vosita sifatida bulutga asoslangan platforma bo'lgan yangi klinik interfeys Roche diagnostikasi bilan birgalikda ishlab chiqilmoqda. Ideal holda, bu amaliyot hamshirasidan konsultant gepatologgacha bo'lgan bemorning diagnostika yo'li bilan shug'ullanadigan barcha sog'liqni saqlash mutaxassislari uchun ochiq bo'ladi, bu takroriylikni kamaytiradi va izchillikni ta'minlaydi.

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RHEUMATOID ARTHRITIS CAUSES DIAGNOSIS AND PERIODS

Annotation: *Rheumatoid arthritis (RA) is a chronic systemic autoimmune inflammatory disease of connective tissues, which manifests itself mainly in the form of erosive-destructive polyarthritis with exacerbation of peripheral joints.*

Key words: *Rheumatoid arthritis RA, inflammation, pain, autoimmune inflammation, ESR.*

Reasons:

In a healthy person, the immune system fights off invaders such as bacteria and viruses. With an autoimmune disease like RA, the immune system mistakes the body's cells for foreign substances and releases inflammatory chemicals that attack those cells. RA attacks the synovial membrane, the tissue around the joint that produces fluid that helps the joint move smoothly. The inflamed synovium thickens and makes the joint area feel painful and tender, appear red and swollen, and the joint may be difficult to move.

Researchers aren't sure why people develop RA. They believe that these individuals may have genes that are activated by an environmental trigger such as a virus or bacteria, physical or emotional stress, or other external factors.

8. Symptoms:

9. In the early stages, people with RA do not experience redness or swelling in their joints, but they may experience tenderness and pain.

10. Joint pain, tenderness, swelling, or stiffness that lasts six weeks or more.

11. Morning sickness that lasts 30 minutes or more.

12. Multiple joints are affected.

13. Small joints (wrist, hand and some joints of the feet) are usually affected first.

14. Symmetrical joints on both sides of the body are affected.

15. Many people with RA feel very tired (fatigue), and some may have a low-grade fever. RA symptoms may come and go. The activity may last several days or months.

16. Eyes: Dryness, pain, inflammation, redness, sensitivity to light and problems with proper vision.

17. Mouth: Dryness and inflammation of the gums, itching or infection.

18. Skin: Rheumatoid nodules are small lumps under the skin over bony areas.

19. Lungs: Inflammation and scarring that can lead to shortness of breath and lung disease.

- Blood vessels: Inflammation of blood vessels that can cause damage to nerves, skin and other organs.

- Blood: The number of red blood cells is less than normal.

- Heart: Inflammation can damage the heart muscle and the area around it.

- Painful joints also make it difficult to exercise, which leads to weight gain. Being overweight can cause people with RA to develop high cholesterol, diabetes, heart disease, and high blood pressure.

Diagnosis:

Getting an accurate diagnosis as soon as possible is the first step to effective RA treatment. The best way to make an accurate diagnosis is to use a history, physical examination, and laboratory tests.

Medical history: Symptoms of the patient's joints (pain, tenderness, numbness, difficulty moving), when they start, come and go, how bad they are, what activities make them better or worse, family members with RA or other asks if you have an autoimmune disease.

Physical exam: The doctor will look for joint tenderness, swelling, warmth and painful or limited movement, nodules under the skin, or a low-grade fever.

Blood tests. Blood tests look for inflammation and blood proteins (antibodies) associated with RA:

Erythrocyte sedimentation rate (ESR or "sed rate") and C-reactive protein (CRP) levels are markers of inflammation. Elevated ESR or CRP in combination with other markers can help diagnose RA.

Rheumatoid factor (RF) is an antibody found (eventually) in about 80 percent of people with RA. Antibodies to cyclic citrullinated peptide (CCP) are found in 60-70% of people with RA. However, they also occur in people without RA. RA can cause the peripheral parts of the bones inside the joint to wear away (erosion). An X-ray, ultrasound, or MRI (magnetic resonance imaging) scan can look for erosions. But if they don't show up in the first tests, it may mean that RA is at an early stage and hasn't yet damaged the bones. Imaging results can also show how well the treatment is working.

Summary: RA is a chronic disease that affects the body's skeletal muscles. Timely detection of these processes in the body ensures that the body is in balance. The body is examined every month and, depending on the conclusions, is placed in rehabilitation and inpatient conditions.

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RESULTS OF SURGICAL TREATMENT OF RECURRENT PULMONARY ECHINOCOCCOSIS DEPENDING ON MORPHOLOGICAL MODIFICATIONS

Abstract.

Relevance. *Along with the increase in the number of new cases of the disease, there is a large percentage of relapses of echinococcosis, the frequency of which, according to different authors, varies widely from 3.3 to 54%, which is due to the existing terminological confusion.*

Material and research methods. *Between 2005 and 2019 53 patients with recurrent pulmonary echinococcosis were operated on in the surgical department of SamMI clinic number 1.*

Research results. *Immediate complications after surgery were observed in 6 (11.3%) patients. Postoperative mortality was noted in 1 (1.9%) case. The cause of death was acute cardiovascular failure.*

Conclusion.*Analysis of the morphological characteristics of echinococcal cysts of the lungs showed that recurrent echinococcosis most often occurred with echinococcus veterinorum (50.9%) echinococcus hominis (37.7%) and with echinococcus acephalocystis no relapses of the disease were observed, and if they did occur (6 – 11, 3%) we associate this with reinvasion of the parasite.*

Keywords: *pulmonary echinococcosis, morphological modifications, surgical treatment.*

Relevance. Human echinococcosis continues to be a serious parasitic disease. According to the WHO and a number of other sources, there is widespread prevalence and a significant increase in incidence among the population [3, 7].

Along with the increase in the number of new cases of the disease, there is a large percentage of relapses of echinococcosis, the frequency of which, according to different authors, varies widely from 3.3 to 54%, which is due to the existing terminological confusion [1, 4, 5, 6].

The purpose of the study : to search for ways to optimize diagnostic and therapeutic measures in patients with recurrent pulmonary echinococcosis, taking into account the morphological forms of hydatid cysts.

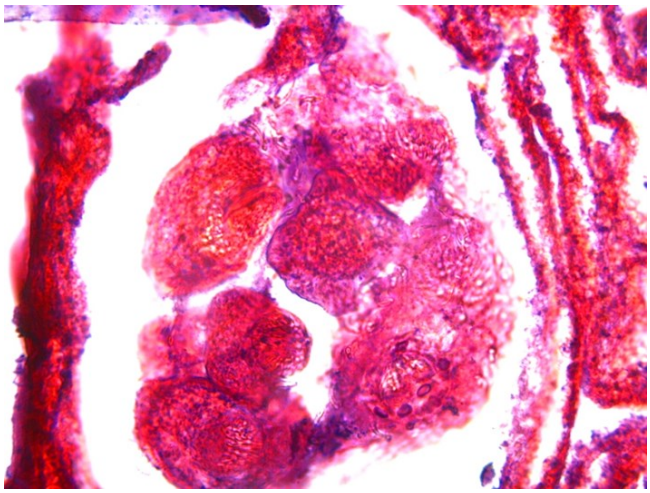
Material and research methods. Between 2005 and 2019odes53 patients with recurrent pulmonary echinococcosis were operated on in the surgical department of SamMI clinic 1. Echinococcosis of the right lung was detected in 29 patients, of the left lung in 17 patients. In 76% of cases, the cysts were located in the lower lobe. Combined echinococcosis of both lungs was observed in 7 patients; the largest number of hydatid cysts were also located in the lower lobe of both

lungs.In case of recurrent pulmonary echinococcosis, solitary cysts were detected only in 24% of cases, mostly patients with multiple and combined echinococcosis predominated in 76% of cases (Table 1).

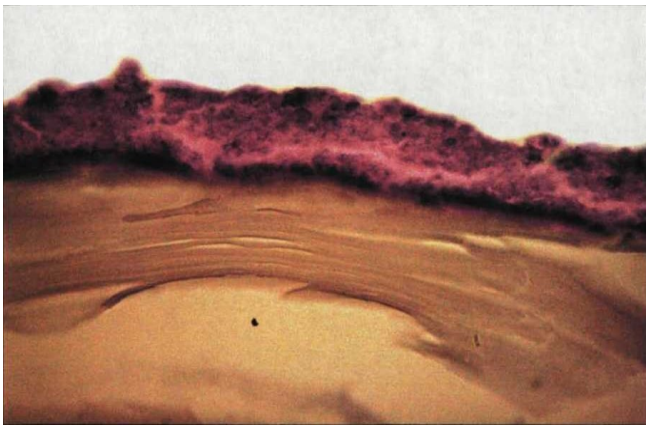
Table 1.distribution of patients by location of echinococcal cysts

Character and localization of cysts		Number of patients	
		Abs.	%
Solitary echinococcosis	Right lung	6	11.3
	Left lung	7	13.2
Multiple echinococcosis	Right lung	23	43.4
	Left lung	10	18.9
Combined echinococcosis		7	13.2
Total		53	100

Depending on the size of the cyst, patients were distributed as follows: small cysts were detected in 6 patients, medium cysts in 24 patients, large cysts in 17 patients, and in 6 patients the cysts were gigantic in size over 20 cm. Complicated cysts were observed in 15 patients, that is, in 28% of cases. Among them, cyst suppuration occurred in 7 patients, cyst rupture into the bronchus was observed in 4 patients, and in 3 patients the cyst ruptured into the pleural cavity. In 1 case there was profuse hemoptysis. The studies were carried out during the preoperative preparation period and over time until the parameters normalized in the postoperative period. Among the instrumental research methods, radiography, computed tomography and ultrasound were used according to indications. We analyzed the morphological modifications of echinococcal lung damage. Modification of echinococcus hominis (Fig. 1) was noted in 20 (37.7%) patients,echinococcus veterinorum(Fig. 2)was noted in 27 (50.9%) patients and echinococcus acephalocystis was noted in 6 (11.3%) observations.



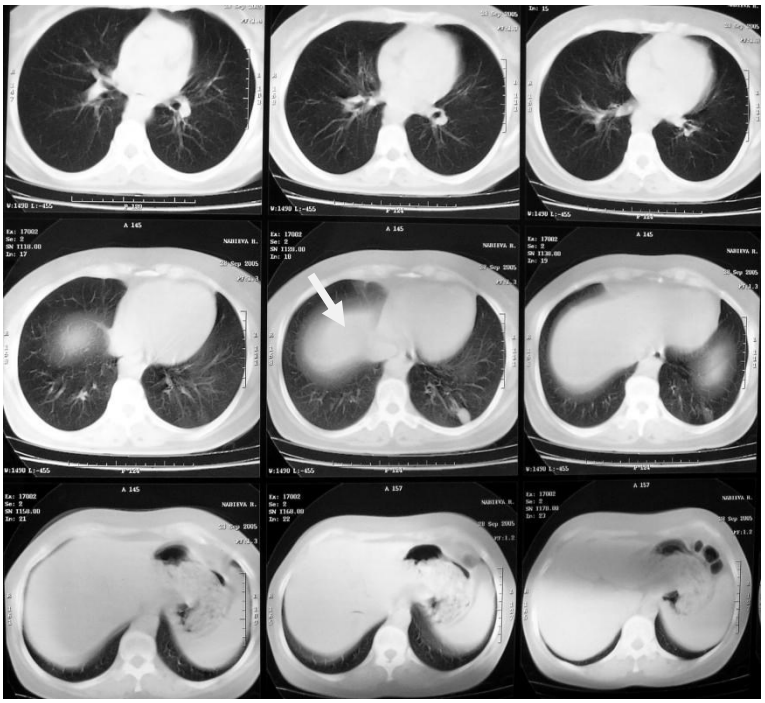
Rice. 1. The structure of an echinococcal cyst modified by echinococcus hominis. Scolex of echinococcus in the thickness of the fibrous capsule (hematoxylin-eosin staining, magnification x 400)



Rice. 2. Structure of an echinococcal cyst modified by echinococcus veterinorum (hematoxylin-eosin staining, magnification x 200)

Plain radiography of the chest does not have specific signs characteristic of the modificationechinococcus hominis. The nature of the morphological form was finally judged intraoperatively.The modification of echinococcus hominis is distinguished by the fact that inside the cyst, in addition to the hydatid fluid, brood capsules with protoscolexes, there are daughter and sometimes grandchild bladders. Maternal cysts macroscopically have a matte, rough surface and are colored milky white or whitish-yellow, as shown in the slide.With this form, there is a migration of scolex beyond the chitinous shell into the thickness, or even beyond the fibrous capsule, and exogenous budding occurs during the growth of the echinococcal cyst.It was with this modification that relapses of the disease were observed on the mnature of pre-existing cysts.

Preoperative diagnosis of modification of echinococcus veterinorum is possible using computed tomography of the chest. In this case, a specific feature is “hydatid sand” at the bottom of the cyst (Fig. 3).



Rice. 3. Computed tomography of the chest “hydatid sand” with hydatid cyst modification of echinococcus veterinorum

In the echinococcus veterinorum form of the disease, only brood capsules and echinococcal fluid are present inside the laurocysts. The formation of daughter bubbles does not occur. Echinococcus veterinorum is perhaps the most aggressive form of the parasite, which is due to the high pressure of the hydatid fluid containing a large number of viable scolex, which, at the slightest violation of the integrity of the membrane, enter the pleural cavity, causing massive damage to the internal organs by echnococcosis. According to our data, this form predominated in the greatest number, in 51% of cases.

Laurocysts of the third modification, echinococcus acephalocystis (Fig. 4), were noted in 6 observations. These types of cysts are characterized by the absence of brood capsules and protoscolexes and are more common in animals than in humans.Preoperative diagnosis of this modification of cysts is very difficult. The X-ray and echographic characteristics of such cysts are very similar to non-parasitic lung cysts.Histological examination of the germinal membrane showed that its entire surface undergoes dystrophic changes, and brood capsules are absent. Therefore, these cysts are not capable of producing germinal elements.

Rice. 4. The structure of an hydatid cyst modified by Echinococcus acephalocystis. (hemotoxylin-eosin stain, magnification x 200).

Research results.53 patients with recurrent pulmonary echinococcosis (100%) underwent surgical intervention. A complicated course of the disease was observed in 17 patients (32.1%).

The timing of surgical interventions was determined by the nature of organ damage by the parasitic process, the presence of complications, how long ago they developed, and concomitant pathology. Since the majority of patients with recurrent echinococcosis were admitted to the hospital in severe and moderate condition, with already developed complications from the cysts, which required preliminary conservative treatment, surgical interventions were mainly delayed and planned.

In order to prevent intraoperative contamination, the pleural cavity was limited with gauze swabs soaked in 100%glycerin solution. Next, puncture of the cyst was performed, evacuation of its contents, cystotomy and removal of the chitinous membrane with daughter and grandchild blisters. For puncture, a thick needle was used, the end of which was connected to a syringe or to an electric suction device.A 100% glycerin solution was used to treat the residual cavity. With regard to the elimination of the residual cavity, the issue was resolved depending on the localization of the process, the size of the residual cavity, the presence of suppurative changes in the thickness of the fibrous capsule and surrounding tissues.

Rice. 5. Echinococcal cyst of the VIII segment of the right lung. Removal of the chitinous membrane from the lumen of the cyst. The pleural cavity is limited by gauze swabs soaked in 100%glycerin solution

Immediate complications after surgery were observed in 6 (11.3%) patients. Postoperative mortality was noted in 1 (1.9%) case. The cause of death was acute cardiovascular failure. Postoperative complications worsened the general condition of the patients and prolonged the duration of their treatment and rehabilitation (Table 2).

Table 2.Results of surgical treatment in the early postoperative period

Nature of complications	Number of complications	
	abs.	%
Cardiopulmonary failure	1 (fatal)	1.9
Wound suppuration and pleural empyema	1	1.9
Pneumonia and limited exudative pleurisy	2	3.8
Encapsulated pleurisy	2	3.8
Total	**6**	**11.3**

Conclusions:

There are 3 morphological modifications of pulmonary echinococcosis: echinococcus veterinorum, echinococcus hominis and echinococcus acephalocystis, each of which has its own specific structure, differing primarily in the structure of the germinal layer of the parasite.

Analysis of the morphological characteristics of echinococcal cysts of the lungs showed that recurrent echinococcosis most often occurred with echinococcus veterinorum (50.9%) echinococcus hominis (37.7%) and with echinococcus acephalocystis no relapses of the disease were observed, and if they did occur (6 – 11, 3%) we associate this with reinvasion of the parasite.

The results of surgical treatment of echinococcal cysts of the lungs largely depend on a differentiated approach to the selection of an adequate method of surgical treatment, taking into account the morphological form of the echinococcal cyst and adherence to the principles of aparasitic and antiparasitic.

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EPIDEMIOLOGY AND TREATMENT OF PSORIASIS

Abstract: *Psoriasis is a long-term, immune-mediated systemic condition that affects a person's quality of life and is impacted by both environmental and hereditary causes. It is also linked to comorbidities. variable ethnic groups have variable rates of psoriasis, but no research has been done on this subject in Uzbekistan as of yet. We assess the prevalence and management of psoriasis from a Uzbekistan standpoint in this review. Studies involving Uzbekistan subjects were our main focus. Uzbekistan is thought to have a 0.5% prevalence of psoriasis, although no population study has been done there yet. The course and incidence of psoriasis in Uzbekistan may be positively impacted by environmental factors, such as climate change, along with genetic factors, such as miscegenation. Numerous investigations have improved our knowledge of the oral, ocular, and cardiovascular comorbidities linked to psoriasis.*

Keywords: *psoriasis, insurance, health care expenditures, comorbidities, epidemiology, accessibility of health services, and health care disparities*

Introduction

Psoriasis vulgaris represents the most prevalent form of psoriasis, which is a long-lasting, immune-mediated systemic disorder influenced by both genetic and environmental factors, associated with various comorbid conditions, and significantly affects the quality of life for those affected. Prevalence rates for psoriasis fluctuate by region and ethnicity, ranging from 0.6% to 4.8% globally, with the absence of cases among Samoans and North American Indians, and the highest rate of 11.8% identified in Kazakhs. In the United States, the prevalence is lower among African-Americans (0.45%–0.7%) compared to the overall North American population (1.4%–4.6%), while a study in Germany involving 48,665 individuals indicated a prevalence of 2.1%. This review aims to gather information regarding the epidemiology, comorbidities, and treatment options available for psoriasis.

Uzbekistan patients' psoriasis epidemiology and comorbidities

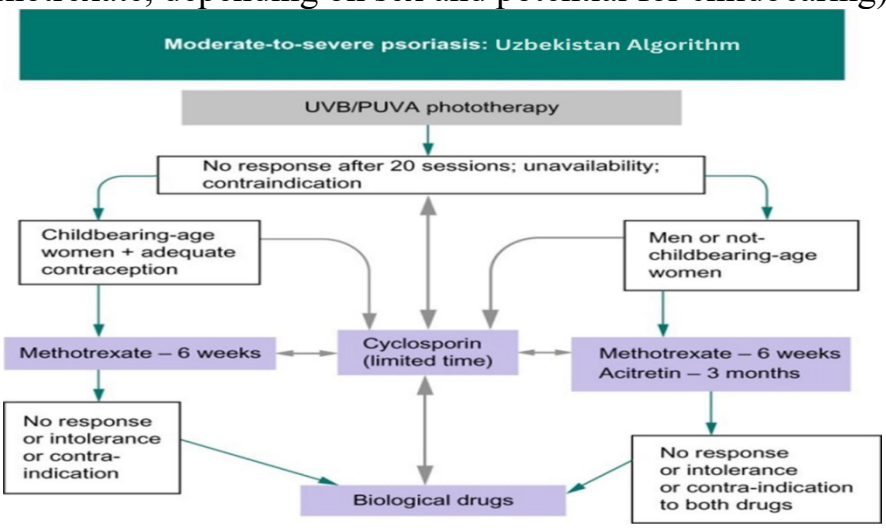
The incidence and prevalence of psoriasis in Uzbekistan have not been assessed in any prior population study. Studies about some clinical features, comorbidities, and psoriasis treatment methods are available, but there are no national databases or registry studies like in other developed nations. Furthermore, it is not possible to extrapolate the findings of regional and national polls to the whole Uzbek population. BSA stands for body surface area; BMI for body mass index; HCV for hepatitis C virus; WhtR for waist-to-height ratio; WC for waist

circumference; WHR for waist-to-hip ratio; DM for diabetic mellitus; DLP for dyslipidemia; HBP for high blood pressure; 95% confidence interval, or 95% odds ratio.

There were no disease-specific oral lesions found in the individuals studied in two Uzbekistan investigations that evaluated the prevalence of oral lesions in psoriasis patients. Geographic tongue and fissured tongue were more common in psoriasis patients than in the general population, but the oral lesions seen in psoriasis patients were also present in the control group.

Materials and Methods

For moderate-to-severe psoriasis, the most recent Uzbekistan guideline (2012) states that the psoriasis area and severity index [PASI] ≥10, body service area [BSA] ≥10, or dermatology life quality index [DLQI] ≥10. An protocol for people without psoriatic arthritis is shown in (Figure 1): phototherapy is administered first, and then traditional antipsoriatic medications (such as acitretin or methotrexate, depending on sex and potential for childbearing).1



When 6 weeks of treatment show no change in PASI or when 10–16 weeks show only slight alterations, methotrexate should be taken into consideration. Patients who have erythrodermic psoriasis and secondary loss of response to traditional or biological medications, as well as pregnant women, should only use cyclosporin for a maximum of two years. Patients who do not respond to phototherapy or who are contraindicated or intolerant to at least one traditional medication should be the only ones prescribed biological medications.1 In Brazil, the National Agency for Sanitary Vigilance (ANVISA) is the health regulatory body that has approved only adalimumab, infliximab, and etanercept for psoriasis and psoriatic arthritis. Only the treatment of psoriasis is presently approved for ustekinumab. The European consensus has established the same biological therapy targets for moderate-to-severe psoriasis.2. The frequency of PUVA and narrow-band UVB (NB-UVB) prescriptions for psoriasis patients who have not responded to topical treatment was assessed in a Brazilian study. Despite the high prevalence of people with increased Fitzpatrick phototypes, NB-UVB was prescribed more often than PUVA, most likely because it had fewer side effects and contraindications.4, 5

In Brazil, research on novel treatments has been limited. In a study by Netto et al.5, 165 psoriasis patients were split into three groups (i.e., 50 µg, 15 µg, and placebo) and treated intradermally with delipidated, deglycolipidated Mycobacterium vaccae (PVAC antigen).

Discussion and results

According to data from the national program of extraordinary distribution (high-cost pharmaceuticals), the percentage of patients taking acitretin was incredibly low between 2000 and 2004 (1.34% of women, 3.38% of males, and 2.08% of both sexes) compared to other costly medications prescribed for various ailments. The same result was observed for the use of cyclosporin for psoriasis and other conditions (2.0% of women, 4.79% of men, and 3% of both sexes). Methotrexate was left out of this plan due to its extremely low cost. Injectable methotrexate was only added to the list of drugs that can be used to treat psoriasis in 2013.6,7

Because of the low quality of the evidence supporting methotrexate, no study assessing its effectiveness was included, even though it was chosen as a psoriasis treatment option in PCDT.6. The government health system deemed the use of biologicals premature because of their "high costs, adverse reactions, comparison to placebo in majority of studies, and short follow up." Curiously, contrary to most guidelines, Schmitt and Wozel34 recommend that severe psoriasis be diagnosed using the same protocol only if BSA ≥ 20% or PASI ≥ 12.

In conclusion,

A number of psoriasis comorbidity studies conducted in Uzbekistan over the past ten years have contributed to our growing understanding of psoriasis as a multisystem disease. There haven't been any population studies done yet to assess the disease's distribution and prevalence across races. There is an urgent need for cost-effectiveness studies, more investments in phototherapy, and systemic drug availability because the Uzbekistan protocol deviates from the country's consensus on psoriasis treatment. Otherwise, the increasing number of lawsuits will worsen the lack of access.

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LUPUS NEPHRITIS AND THE ISOLATION OF KIDNEY LEUKOCYTE

Abstract: *At least 20% of patients with Systemic Lupus Erythematosus (SLE) who are at risk of developing end-stage renal disease (ESRD) experience renal injury, a serious complication. Because immune cell infiltration into the kidneys is closely linked to lupus nephritis, preventing this infiltration may slow the progression of the disease.*

Effective and repeatable isolation procedures are necessary to investigate the function of kidney-infiltrating leukocytes.

Keywords: *renal biopsy; stratification; surrogate biomarkers; lupus nephritis; personalized medicine.*

The introduction

As it progresses to severe pathology and renal failure, nephritis—a common and dangerous manifestation of many autoimmune diseases—significantly raises the risk of morbidity and mortality.

Depending on the related autoimmune disease, nephritis can have different specific forms and underlying mechanisms (Anders & Rovin, 2016; Davidson, 2016; McGaha & Madaio, 2014; Yu et al., 2017). The deposition of immune complexes in the glomeruli, which causes local inflammation and attracts pro-inflammatory immune cells, is frequently the cause of renal injury. The mechanisms underlying autoimmune nephritis have been better understood thanks to experimental models of SLE. For example, autoreactive antibodies that target elements like the glomerular basement membrane (Reynolds, 2011) or megalin (Spicer et al., 2007) are administered to inducible models to replicate disease pathogenesis. These mice have an increased inflammatory response to IgG-containing immune complexes and hyperactive B cell responses due to the lack of the inhibitory Fcγ receptor for IgG. FcγRIIb deficiency causes spontaneous autoimmune pathology, which is similar to human SLE in that it results in splenomegaly, anemia, systemic immune activation, anti-nuclear antibody production, and fatal nephritis (Bolland & Ravetch, 2000; Bolland et al., 2002; Tarasenko et al., 2007).

Evaluation of Renal Function: Analysis of Proteinuria

Experimental animals are usually chosen at advanced stages of kidney damage, when immune cell infiltration is more noticeable, in order to efficiently isolate kidney-infiltrating leukocytes. Blood creatinine or blood urea nitrogen (BUN) levels are two ways to measure kidney function in live animals. However,

as needed in studies of disease progression, repeated blood sampling over long periods of time can introduce variability, especially in autoimmune models. Frequent blood draws may also change the animal's blood composition and raise the risk of infections.

Materials and methods

Data Gathering

To determine how many leukocytes have entered each kidney:

Samples are examined using flow cytometry. To guarantee reliable comparisons, all samples must be processed using the same parameters, such as the same acquisition time and sample volume.

Analyzing Flow Cytometry

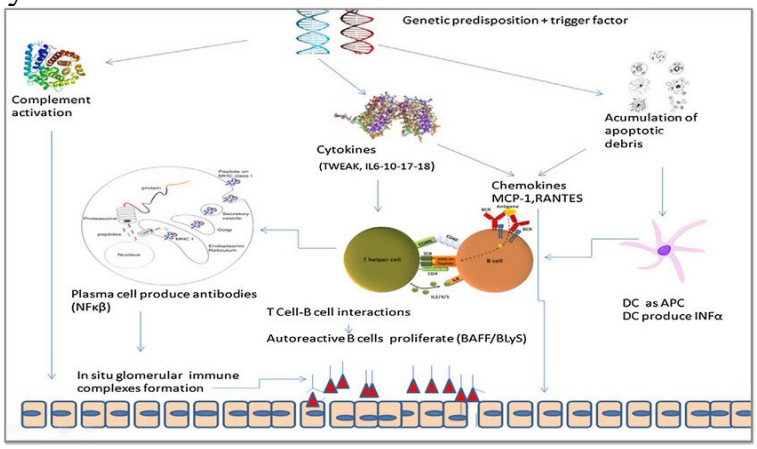
FlowJo (Tree Star) or comparable analytical software is used to analyze the results of flow cytometry.

• To mark circulating leukocytes, a CD45.2 BV421-conjugated antibody is used.

• Blood samples help determine the proper gating:

Mice without injections serve as negative controls, while mice with injections serve as positive controls.

The presence of immune cells in kidney tissue can be precisely measured thanks to this method, which helps differentiate between circulating and infiltrating leukocytes.



Lupus Nephritis Pathogenesis: Numerous genes have been linked to lupus nephritis (LN) by genomic research, but each gene only slightly raises the risk of systemic lupus erythematosus (SLE). Epigenetic, hormonal, and environmental factors all contribute to immune system dysregulation, which further complicates the disease's progression. The creation of immune complexes in the kidney, particularly between circulating antichromatin antibodies and extracellular chromatin in the glomeruli, is the most likely starting point for LN. Increased turnover of inflammatory cells and poor neutrophil and macrophage clearance of apoptotic cells are the causes of these autoantibodies.

Result and discussion

1. The Marker of Proteinuria

The degree of leukocyte infiltration in the kidney is closely linked to the severity of proteinuria in the FcγRIIb[KO] model. While female mice typically develop proteinuria earlier, male mice typically start to show symptoms around 5 months of age.

2. Managing Reagents Sensitive to Light

Light sensitivity is exhibited by fluorochrome-conjugated antibodies. As soon as the animals are injected, reduce their exposure to light to maintain their integrity.

3. Selection of Antibodies and Fluorochromes

When examined using the LSR II flow cytometer (BD Biosciences), the CD45.2 BV421 and CD45.2 PE-Cy7 antibodies produced the most distinct separation signals among the tested options.

The growth of lymphoid tissue in the tubulointerstitial space, the kidney's own production of local antibodies, and the activation of the complement system all exacerbate renal inflammation. By increasing MHC class II expression, dendritic cell (DC) activation improves antigen presentation and initiates the production of interferon (IFN). T cells are subsequently stimulated, and B cells are encouraged to differentiate into plasma cells that release antibodies. Elevated interferon levels and increased leukocyte mRNA expression are common in SLE patients.

In response to immune complexes and complement components, leukocytes and kidney cells release proinflammatory cytokines and chemokines, which prolong the inflammatory cycle and lead to recurrent episodes of nephritis.

In conclusion

It is crucial to use accurate and effective techniques for assessing immune cell infiltration in the kidney because autoimmune diseases, especially lupus glomerulonephritis in murine models, are complicated and variable. This protocol provides a reliable and controlled system for studying renal leukocyte infiltration using the FcγRIIb knockout (FcγRIIb[KO]) mouse model. According to this model, kidney damage and immune cell infiltration are strongly correlated, and the degree of proteinuria is consistent with this relationship. Simple urine tests can be used to easily monitor proteinuria levels.

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POSSIBILITY OF AIRBORNE TRANSMISSION OF E. COLI SEROTYPES IN THE EPIDEMIOLOGY OF COLIENTERITIS

Abstract. *The study investigates the epidemiology of colienteritis, particularly the role of airborne transmission of pathogenic E. coli. A survey was conducted on 253 children under 3 years of age to determine the localization of pathogenic E. coli serotypes in the pharynx. It was found that in 55% of children with colienteritis, pathogenic E. coli were detected in the pharyngeal mucus.*

The study results confirm the high contagiousness of colienteritis, associated with the droplet spread of the pathogen. The effectiveness of ultraviolet irradiation for disinfecting air from pathogenic E. coli was noted, allowing UV irradiation to be recommended as a method of combating colienteritis in childcare facilities.

Keywords. *Colienteritis, Escherichia coli, E. coli, pathogenic serotypes, epidemiology, airborne transmission, carriage.*

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KOLIENTERIT EPIDEMIOLOGIYASIDA E. COLI SEROTIPLARNING HAVO-TOMCHI YO‘LI ORQALI TARQALISH EHTIMOLI

Annotatsiya. *Tadqiqot kolienterit epidemiologiyasini, xususan, patogen E. coli ning havo-tomchi yo‘li orqali yuqishidagi rolini o‘rganishga bag‘ishlangan. 3 yoshgacha bo‘lgan 253 nafar bolaning hiqildog‘ida patogen E. coli serotiplarining lokalizatsiyasi tekshirildi. Kolienterit bilan kasallangan bolalarning 55% da patogen E. coli hiqildoq shillig‘ida aniqlangani aniqlandi.*

Tadqiqot natijalari qo‘zg‘atuvchining tomchi orqali tarqalishi bilan bog‘liq kolienteritning yuqori kontagiozligini tasdiqlaydi. Havoni patogen E. coli dan

dezinfeksiya qilishda ultrabinafsha nurlanishning samaradorligi qayd etildi, bu ultrabinafsha nurlanishni bolalar muassasalarida kolienteritga qarshi kurashish usuli sifatida tavsiya etishga imkon beradi.

Kalit so‘zlar: *Kolienterit, Escherichia coli, E. coli, patogen serotiplar, epidemiologiya, havo-tomchi yo‘li, tashuvchilik.*

Kirish. E. coli tomonidan keltirilib chiqariluvchi kolienterit – bolalikning erta yoshidagi eng ko‘p tarqalgan infeksion kasalliklardan biri bo‘lib, mahalliy va xorijiy tadqiqotchilar tomonidan sinchiklab o‘rganilmoqda. Ammo shu kungacha bu kasallikning ba’zi epidemiologik xususiyatlari hali to‘liq tushuntirilmagan.

Ma’lumki, kolienterit yuqori kontagiozlik bilan tavsiflanadi. Bemor bolalar jamoasida yoki shifoxonada bo‘lganida bolalar orasida tezda kasallanish holatlari yuzaga keladi.

Kolienterit qo‘zg‘atuvchisi juda tez (ba’zi ma’lumotlarga ko‘ra, bir necha soat ichida) atrof-muhitdagi ob’ektlarda (N. I. Zasepin va T. F. Stupakova; M. S. Spasov; Adam) aniqlanadi. Bir-ikki kun ichida patogen serotiplar axlat bilan kontakt orqali ajralib chiqishi mumkin. Bemor boshqa palataga ko‘chirilganida, ertasi kuni patogen E. coli aniqlanadi va ular atrof-muhitdagi ob’ektlarda (M. S. Spasov) topiladi. Qo‘zg‘atuvchining tez tarqalishi kasalxonalarning oshqozon - ichak bo‘limlarida umum qabul qilingan gigiena qoidalariga rioya qilinganda ham sodir bo‘lishi haqida xabarlar mavjud.

Kolienterit epidemiologiyasini o‘rganishda, xususan, kasallikning yuqori kontagiozligi sababini o‘rganishda, adabiyotdagi qiziqarli xabarlar mavjud bo‘lib, ularga ko‘ra patogen serotiplar ko‘pincha kolienteritli bemorlarning hiqildog‘ida ham (A. A. Peremыslova; Laurell; Andreoni; Farkas va Sekresi, va boshq.) uchrashidir. Natijada ba’zi tadqiqotchilar qo‘zg‘atuvchining tashqi muhitga shilliq tomchilari bilan ajralib chiqishi mumkin deb hisoblashadi, bu havo va atrof-muhitdagi patogen serotiplar E. coli bilan qisqa vaqt ichida (N. I. Zasepin; Laurell, va boshq.) statsionarga yotqizilgandan keyin ham yuqishga olib keladi.

Tadqiqot maqsadi. Kolienterit epidemiologiyasida E. coli serotiplarning hiqildoqdagi lokalizatsiyasini o‘rganish.

Tadqiqot maateriali va uslublari. E. coli ning serotiplarning hiqildoqdagi lokalizatsiyasini o‘rganish uchun 3 yoshgacha bo‘lgan 253 nafar bola tekshirildi. Ekish, shilliq namunalari steril paxta tamponlari yordamida olingan va ular umumiy qabul qilingan uslub bo‘yicha ichak tayoqchalarini identifikatsiyalash uchun Endo muhitiga ekilgan.

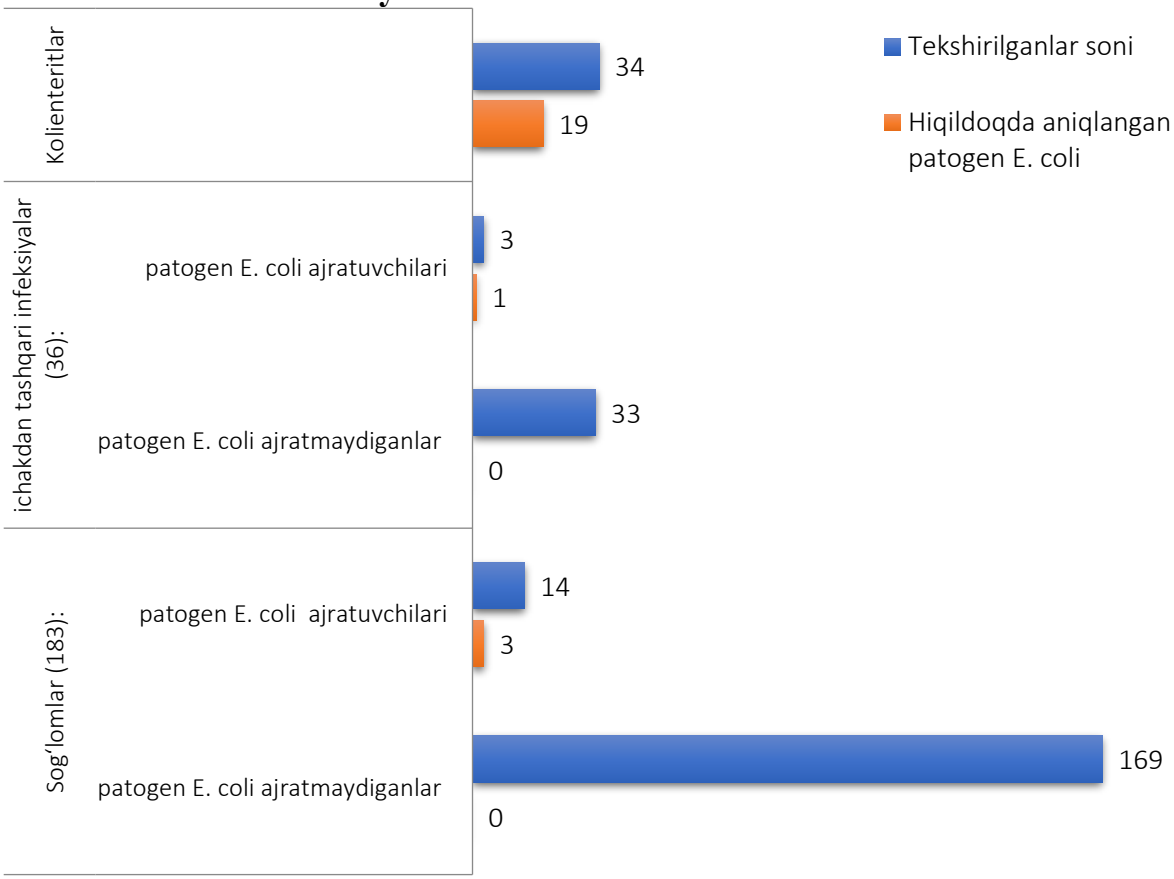
Hiqildoq shilliq qavatining ajralib chiqish qobiliyatini tekshirish uchun "yo‘tal plastinkalari" usulidan foydalanildi. Kolienterit bilan kasallangan bola qichqirgan vaqtda, ochiq Petri kosasi Endo muhiti bilan og‘zidan 25-30 sm masofada tutildi.

Bolalar yotgan palatalar havosining bakteriologik tadqiqotida Krotov apparatidan foydalanildi; apparatda havo harakati tezligi 25 l/min.; ekspozitsiya 40 daqiqani tashkil etdi; Endo muhitidan foydalanildi.

Tadqiqot natijalari. Kolienterit bilan kasallangan bolalarning hiqildoq shillig‘ida patogen E. coli serotiplari 55% hollarda aniqlangan. Sog‘lom va patogen E. coli tashuvchisi bo‘lmagan ichakdan tashqari kasalliklarga chalingan bolalarning hiqildoq shillig‘idan, qoida tariqasida, bakteriyalar ekilmagan.

Kasal bolalarning hiqildog‘ida patogen E. coli serotiplarning bunchalik tez-tez mavjudligini inobatga olib, biz bakteriyalar shilliq va so‘lak tomchilari bilan tashqi muhitga ajralib chiqadi, xuddi nafas yo‘llari infeksiyalarida bo‘lgani kabi, deb taxmin qildik. Natijada, Endo muhitida E. coli O111B4 koloniyalari o‘sdi, ular ilgari o‘sha bolaning axlati va hiqildoq shillig‘ida aniqlangan edi. Bunday turdagi tadqiqotlar yana 3 nafar bemorda ham xuddi shunday natijalar bilan takrorlandi. Shunday qilib, patogen E. coli ning tomchi yo‘li bilan tashqi muhitga ajralib chiqish imkoniyati haqidagi taxminimiz tasdiqlandi.

Tekshirilgan bolalarning hiqildog‘ida patogen E. coli aniqlanganligi bo‘yicha ma’lumotlar



Keyinchalik, kolienterit bilan kasallangan bolalar yotgan palatalar havosining bakteriologik tadqiqoti o‘tkazildi. Natijada, tekshirilgan palatalar havosida kolienterit bilan kasallangan bolalarning hiqildog‘idan aniqlanganlariga o‘xshash ko‘p miqdorda ichak tayoqchalari borligini aniqladik.

Qiyosiy ma’lumotlarni olish uchun biz turli xonalar: kasalxona palatalari, tug‘ruqxona palatalari, bolalar bog‘chalari, bolalar uylari va talabalar o‘quv xonalari havosining bir qator bakteriologik tadqiqotlarini o‘tkazdik.

Keyinchalik palatalar havosini bakteriologik tekshirish o‘tkazildi, u yerda kolienterit bilan kasallangan bolalar bor edi. Tekshirish uchun Krotov apparati ishlatildi; apparatda havo harakati tezligi 25 l/min.; ekspozitsiya 40 daqiqa; Endo muhiti ishlatildi. Natijada, tekshirilgan palatalar havosida kolienterit bilan kasallangan bolalarning hiqildog‘ida aniqlanganlariga o‘xshash ko‘p miqdorda ichak tayoqchalari borligini aniqladik.

Qiyosiy ma’lumotlarni olish uchun biz turli xonalarning bakteriologik tekshiruvlarini o‘tkazdik: kasalxona palatalari, tug‘ruqxona binolari, bolalar bog‘chalari, bolalar uylari va talabalar o‘quv xonalari mashg‘ulot paytida.

Tadqiqotlar shuni ko‘rsatdiki, kolienterit bilan kasallangan bolalar bo‘lgan palatalar havosida yoki patogen E. coli tashuvchilari bo‘lgan bolalar bog‘chalari va bolalar uylarining binolarida patogen ichak tayoqchalari aniqlangan.

Biz olgan ma’lumotlar havoni patogen ichak tayoqchalari bilan tomchi yo‘li orqali zararlanish imkoniyati haqida xulosa chiqarishga imkon beradi.

Kolibakterial infeksiyaning tomchi orqali tarqalishi masalasi, shubhasiz, keyingi tadqiqotlarni talab qiladi, chunki, ehtimol, qo‘zg‘atuvchining tomchi yo‘li bilan tarqalishi kolienteritni xarakterlovchi yuqori kontagiozlikni keltirib chiqaradigan muhim omillardan biridir.

Patogen E. coli serotiplarga ultrabinafsha nurlarning bakteritsid ta’siri haqidagi ko‘rsatmalarni (Z. P. Goryainova-Ikol va R. Yu. Ter-Pagosyan) hisobga olib, biz kolienterit bilan kasalxonaga yotqizilgan bemorlar bo‘lgan palatalarni simobli-kvars lampa yordamida nurlantirdik. 1 soat davomida bemorlar bo‘lgan palata nurlantirildi; havoda $O_{55}B_5$ serotipidagi ichak tayoqchalari mavjud edi. Biz olgan natijalar umidbaxsh bo‘ldi: havo ekilgandan so‘ng kolienterit qo‘zg‘atuvchilari aniqlanmadi. Shunga o‘xshash holat kolienterit bilan kasallangan ikkita palatani nurlantirgandan keyin ham kuzatildi.

Xulosa. Shunday qilib, ultrabinafsha nurlarning patogen E. coli serotiplarga zararli ta’sir ko‘rsatishi tasdiqlandi, bu esa havoni tozalashga yordam beradi. Bu bolalar kasalxonalari palatalari, tug‘ruqxona binolari, bolalar bog‘chalari va bolalar uylarining havosini kolienteritga qarshi kurashning muhim vositalaridan biri sifatida tizimli ultrabinafsha nur bilan zararsizlantirishni tavsiya etishga imkon beradi.

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МЕХАНИЗМЫ НАРУШЕНИЯ ГЕПАТОГЕНЕЗА У ПОТОМСТВА ПРИ ВОЗДЕЙСТВИИ ЗАГРЯЗНИТЕЛЕЙ ВОЗДУХА НА ОРГАНИЗМ МАТЕРИ

Аннотация. *Воздействие атмосферных загрязнителей на организм беременной женщины является критическим фактором, способным вызывать нарушения органогенеза у плода. Печень, как один из наиболее уязвимых органов в период эмбрио- и фетогенеза, подвергается морфофункциональной дезорганизации под действием мелкодисперсных частиц (PM2.5), диоксинов, оксидов азота и полициклических ароматических углеводородов (ПАУ). Настоящий обзор обобщает результаты экспериментальных и гистологических исследований, посвящённых выявлению структурных изменений печени у потомства после внутриутробного воздействия загрязнителей воздуха. Особое внимание уделяется нарушениям архитектоники гепатоцитов, сосудистого русла, стромальных элементов и воспалительных реакций. Обсуждаются возможные механизмы, включая оксидативный стресс, митохондриальные повреждения, эпигенетическую регуляцию и цитокиновое воспаление.*
Ключевые слова: *гепатогенез, гистология печени, загрязнение воздуха, пренатальное воздействие, морфология, гепатоцит, окислительный стресс, воспаление, PM2.5, плацентарная передача*

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MECHANISMS OF DISRUPTED HEPATOGENESIS IN OFFSPRING DUE TO MATERNAL EXPOSURE TO AIR POLLUTANTS

Abstract: *Exposure of pregnant women to atmospheric pollutants is a critical factor that can lead to impaired organogenesis in the fetus. The liver, as one of the most vulnerable organs during the stages of embryonic and fetal development, undergoes morphofunctional disorganization under the influence of fine particulate matter (PM2.5), dioxins, nitrogen oxides, and polycyclic aromatic hydrocarbons (PAHs). This review summarizes experimental and histological studies aimed at*

identifying structural liver changes in offspring following in utero exposure to air pollutants. Particular attention is paid to disruptions in hepatocyte architecture, vascular structures, stromal components, and inflammatory responses. The discussion highlights possible mechanisms including oxidative stress, mitochondrial damage, epigenetic regulation, and cytokine-mediated inflammation.

Keywords: *hepatogenesis, liver histology, air pollution, prenatal exposure, morphology, hepatocyte, oxidative stress, inflammation, PM2.5, placental transfer*

На ранних этапах эмбрионального развития печень выполняет как метаболические, так и кроветворные функции, требующие высокой степени клеточной дифференцировки и сосудистой интеграции. Внутриутробное воздействие ксенобиотиков, поступающих из загрязнённой внешней среды, может нарушать нормальную архитектонику печени и приводить к её функциональной незрелости. Морфологические проявления таких нарушений включают деструкцию гепатоцитов, дезорганизацию синусоидального капиллярного русла, фиброзные изменения, воспалительную инфильтрацию и нарушение баланса между паренхиматозным и стромальным компонентами [1,2].

Методы анализа: Обзор включает публикации за 2010–2024 гг., отобранные по ключевым словам: *prenatal exposure*, *liver histology*, *air pollution*, *fetal liver development*, *PM2.5*, *toxicity*, *hepatic morphology*. Включены данные микроскопических исследований (световая, электронной и иммунофлуоресцентной микроскопии) печени эмбрионов и новорождённых животных после ингаляционного воздействия на самок в период беременности [3,4].

Гистологические изменения печени у потомства

1. Изменения гепатоцитов

Во многих моделях наблюдаются признаки вакуолизации цитоплазмы, пикноз ядер, митохондриальные повреждения и деструкция мембран. Часто фиксируются признаки стеатоза, апоптоза и сниженной митотической активности. Имуногистохимия выявляет снижение экспрессии белков пролиферации (Ki-67), транскрипционных факторов HNF4α, Foxa2 и альбумин-синтезирующих гепатоцитов.

2. Структура печёночных долек и синусоидов

Нарушается радиальное расположение гепатоцитов вокруг центральной вены, отмечается дезорганизация синусоидального русла, утолщение эндотелия, выраженный перисинусоидальный фиброз. При воздействии PM2.5 в поздние сроки беременности описана трансформация структуры капилляров в сосуды смешанного типа, а также перицитоз.

3. Воспалительная инфильтрация

Нейтрофильная и мононуклеарная инфильтрация наблюдаются в портальных трактах и перицентральной зоне. Повышается экспрессия TNF-α, IL-1β и IL-6, что подтверждается иммуногистохимией. Активируются клетки Купфера, усиливается экспрессия маркеров CD68 и iNOS.

4. Фиброз и ремоделирование стромы

У новорождённых животных, подвергавшихся пренатальному воздействию диоксинов и ПАУ, выявлены начальные признаки фиброзирования — отложение коллагена I и III типа (подтверждено окраской по Массону и выраженной экспрессией α-SMA). Эти изменения рассматриваются как предвестники раннего программирования фиброгепатоза [5,6].

5. Гистогенез желчевыводящих путей

При нарушении экспрессии генов Notch-сигнального пути (Jag1, Hes1) возможно уменьшение числа холангиоцитов, нарушения формирования междольковых жёлчных протоков, что коррелирует с признаками холестаза.

Механизмы, лежащие в основе морфологических нарушений

- **Оксидативный стресс**: индуцирует повреждение липидов, белков и нуклеиновых кислот гепатоцитов.
- **Нарушение митохондриального метаболизма**: снижение активности цитохрома С, нарушение β-оксидации.
- **Эпигенетическая перестройка**: метилирование генов роста и дифференцировки, в том числе HNF-семейства.
- **Системное воспаление матери**: приводит к активации врождённого иммунитета плода и гепатальной воспалительной реакции.
- **Эндокринные эффекты загрязнителей**: ПАУ и диоксины действуют как эндокринные дизрупторы, влияя на гормон-зависимую регуляцию роста печени.

Заключение Пренатальное воздействие загрязнителей воздуха вызывает выраженные морфологические и гистологические изменения печени у потомства. Наиболее значимыми являются нарушения клеточной дифференцировки, фиброз, воспаление и сосудистая дезорганизация. Эти данные подчёркивают важность мониторинга качества воздуха в регионах с высоким уровнем урбанизации и необходимость включения гистологических маркеров в оценку перинатального риска метаболических заболеваний. Будущие исследования должны быть направлены на детализацию дозозависимых эффектов, установление специфических биомаркеров воздействия и поиск методов нейтрализации негативных морфогенетических изменений [7,8].

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ОСЛОЖНЕНИЯ ПРИ СИНДРОМЕ ПОРТАЛЬНОЙ ГИПЕРТЕНЗИИ.КЛИНИЧЕСКИЕ ПРОЯВЛЕНИЯ, СИМПТОМЫ. МЕТОДЫ ИССЛЕДОВАНИЯ ПОРТАЛЬНОЙ ГИПЕРТЕНЗИИ

Цель: *Изучение синдрома портальной гипертензии, его осложнения и симптомы. Освоить основные проявления при различных методах исследования.*

Ключевые слова: *Портальная гипертензия, желтуха, АЛТ, АСТ, спленомегалия, асцит.*

Аннотация: *Проявления ПГ зависят от уровня портального блока, основного заболевания, вызвавшего нарушение кровотока в воротной вене, степени тяжести поражения печени и характера возникших осложнений.*

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COMPLICATIONS OF PORTAL HYPERTENSION SYNDROME. CLINICAL MANIFESTATIONS, SYMPTOMS. METHODS OF STUDYING PORTAL HYPERTENSION

Purpose: *Study of portal hypertension syndrome, its complications and symptoms. Master the main manifestations in various methods of study.*

Keywords: *Portal hypertension, jaundice, ALT, AST, splenomegaly, ascites.*

Abstract: *The manifestations of portal hypertension depend on the level of portal blockage, the underlying disease that caused the impaired blood flow in the portal vein, the severity of liver damage, and the nature of the complications.*

Обсуждение: Портальная гипертензия — синдром повышенного давления в системе воротной вены, вызванного нарушением кровотока в портальных сосудах, печёночных венах и нижней полой вене. Портальная гипертензия сопровождается спленомегалией, варикозным расширением вен пищевода и желудка, асцитом, печёночной энцефалопатией. В настоящее время данным заболеванием болеют лица, превышающие 40-45 лет. По статистике каждый 10 человек этого возраста болеет синдромом ПГ.

Главными симптомами ПГ являются:

– симптомы основного заболевания, вызвавшего ПГ;

– варикозное расширение вен пищевода, кардиального отдела желудка,

прямой кишки, осложненное пищеводно-желудочным (прямокишечным) кровотечением;
– изменение размеров и нарушение функции печени;
– печеночная недостаточность с развитием энцефалопатии;
– прогрессирующее накопление асцитической жидкости;
– спленомегалия с явлениями гиперспленизма.
Диагностика синдрома ПГ основывается на жалобах пациента.

Больной А., 45 лет, поступил в терапевтическую клинику в 2023/4 1978 г. по поводу желтухи, общего недомогания кровавой рвоты. В 2021 году перенёс желтуху, не лечился. через 1,5 месяца появился асцит и стал увеличиваться в размерах. Увеличилась печенью. С тех пор в течении 8 месяцев до 2022 года производились пункции.

ЖАЛОБЫ

При обследовании пациента выявляются:
– болевой синдром;
– астенический синдром;
– диспептический синдром;
– пищеводно-желудочные (прямокишечные) кровотечения;
– венозный рисунок на передней брюшной стенке;
– признаки печеночной недостаточности;
– асцит (увеличение в размерах живота).

Анамнез жизни

-1978 года рождения
-женат
-работает строителем, нерегулярно занимается перевозчиком, в связи с работой бывали не крупные ранения
-не переносил острых заболеваний органов брюшной полости
-регулярно выпивает алкогольсодержащие напитки
-иногда переносил ОРВИ
-в детстве не болел гнойными заболеваниями
-симптомы ПГ начались в 2021 году, в марте.

Данные объективного исследования

При объективном осмотре выявляются следующие признаки ПГ: клинические признаки цирроза, расширение вен передней брюшной стенки («голова медузы»), гепатомегалия, спленомегалия, отеки (диспротеинемия). Нужно учитывать, что у каждого третьего пациента с циррозом печени наблюдаются выраженные клинические симптомы энцефалопатии — синдрома, объединяющего неврологические и психоэмоциональные нарушения, обусловленные метаболическими нарушениями в центральной нервной системе. У данного не проявлялись данные симптомы. Наблюдается пожелтение склеры глаза.

Инструментальные исследования:

Результаты УЗИ: нижняя полая вена сдавлена, то давление в ней возрастает свыше 200 мм вод.ст, выраженное расширение селезеночной вены

- 0,98 ± 0,17 см, спленомегалия (длина селезенки - 14,8 ± 2,7 см), диаметр портальной вены 4мм. Выраженная гепатомегалия, со смещением границ печени к центру и сдавление общего желчного протока, сосудов селезенки. Результаты МРТ дают знать выраженное увеличение границ и накопление большого количества жидкости в брюшной полости.

Лабораторные исследования

Биохимические показатели крови:

№	Наименование исследований	Норма	Результат
1	АЛТ	0,1-0,68 ммоль/л	1,61ммоль/л
2	АСТ	0,1-0,45 ммоль/л	0,93ммоль/л
3	Тимоловая проба	(0-4) S-H	7,7
4	Креатинин	М 65-119 Ж 53-97	257
5	Мочевина	2,5-8,3 ммоль/л	7,8

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ВЛИЯНИЕ БОЛЕЗНЕЙ СЕРДЦА НА ЗДОРОВЬЕ ПОЛОСТИ РТА

Аннотация: *Этот обзор направлен на изучение и выделение взаимосвязей между болезнями сердца и здоровьем полости рта, подчеркивая взаимное влияние этих двух аспектов здоровья. Современные исследования показывают, что плохое состояние полости рта, включая такие заболевания, как гингивит и пародонтит, может способствовать развитию или ухудшению сердечных заболеваний. В обзоре рассматриваются биологические механизмы, посредством которых проблемы полости рта влияют на сердечно-сосудистую систему, включая системное воспаление и распространение бактерий из полости рта в кровоток. Также обсуждаются стратегии профилактики и улучшения здоровья полости рта у пациентов с сердечными заболеваниями, подчеркивая важность сотрудничества между стоматологами и кардиологами.*

Ключевые слова: *здоровье полости рта, пародонтит, болезни сердца, оральные бактерии, профилактика.*

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THE IMPACT OF HEART DISEASES ON ORAL HEALTH

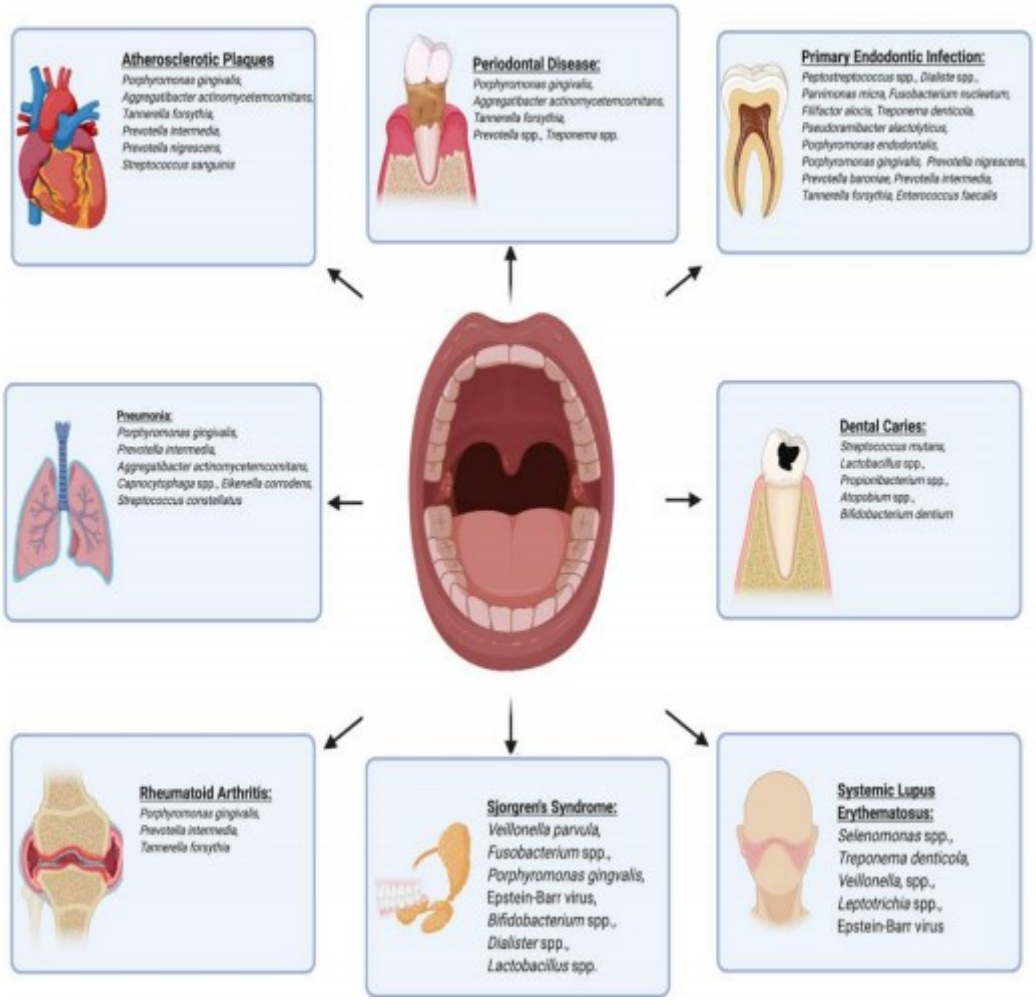
Abstract: *This review aims to explore and highlight the interconnections between heart disease and oral health, emphasizing the mutual influence of these two aspects of health. Modern research shows that poor oral health, including conditions such as gingivitis and periodontitis, can contribute to the development or worsening of heart diseases. The review examines the biological mechanisms through which oral health problems affect the cardiovascular system, including systemic inflammation and the spread of bacteria from the oral cavity into the bloodstream. It also discusses strategies for preventing and improving oral health in patients with heart disease, emphasizing the importance of collaboration between dentists and cardiologists.*
Keywords: *oral health, periodontitis, heart disease, oral bacteria, prevention.*

Введение

Здоровье полости рта и болезни сердца — две области, которые на первый взгляд могут казаться не связанными, однако последние исследования

демонстрируют значительную взаимосвязь между ними. Различные проблемы полости рта, такие как гингивит и пародонтит, ассоциируются с повышенным риском развития сердечно-сосудистых заболеваний, включая атеросклероз и инфаркт миокарда [1-3].

Эта связь часто обусловлена воспалительными процессами и наличием бактерий из полости рта, которые могут попадать в кровоток и влиять на другие органы, включая сердце [1,2].



Изображение 1. Оральные бактерии и системные заболевания [3]

Понимание взаимосвязи между здоровьем полости рта и болезнями сердца открывает значительные возможности для первичной профилактики обоих состояний [2,3].

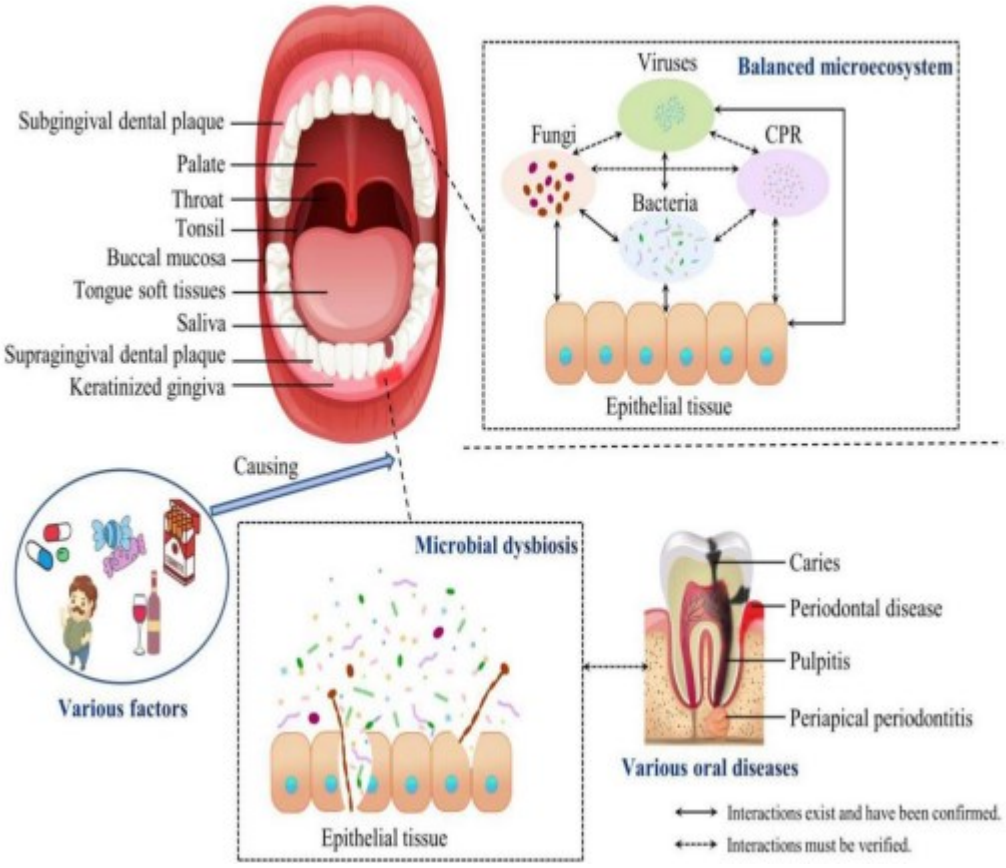
Улучшение здоровья полости рта может снизить риск сердечных осложнений. Эти знания позволяют проводить более ранние и эффективные медицинские вмешательства для пациентов с высоким риском. Интегрированный подход к управлению здоровьем способствует повышению качества жизни пациентов [1-3].

Это будет включать конкретные рекомендации по улучшению взаимодействия между стоматологами и кардиологами в ведении пациентов с такими состояниями или предрасположенных к ним [1-4].

Строение полости рта

Зубы являются важнейшими элементами для пережёвывания пищи, способствуя её измельчению для правильного пищеварения. Здоровые зубы также играют роль в чёткости речи и эстетическом виде [2-4]

Изображение 2. Полость рта и влияющие факторы [4]



Дёсны - это защитная ткань, которая окружает и поддерживает зубы. Здоровые дёсны необходимы для устойчивости зубов и защиты нижележащих структур от инфекций [2-4].

Язык помогает перемешивать пищу во время жевания и является основным органом вкусовой чувствительности. Он также играет ключевую роль в формировании звуков речи [2-4].

Слизистая оболочка полости рта - это слой клеток, выстилающий всю ротовую полость. Она защищает подлежащие ткани и помогает бороться с патогенами [3-5].

Слюна - жидкость, вырабатываемая слюнными железами, которая увлажняет полость рта, инициирует процесс пищеварения и ограничивает рост бактерий [3-5].

Основные заболевания полости рта

Различные проблемы со здоровьем полости рта могут затрагивать её структурные компоненты.

Кариес зубов [4-6]:

6. Повреждение зубной эмали под действием кислот
7. Кислоты вырабатываются бактериями, метаболизирующими сахара из пищи
8. Результат - разрушение твёрдых тканей зуба

Гингивит [5,6]:

- Воспаление дёсен, вызванное скоплением зубного налёта
- При отсутствии лечения может прогрессировать в пародонтит
- Характеризуется покраснением, отёком и кровоточивостью дёсен

Пародонтит [5-7]:

- Тяжёлое инфекционное поражение тканей пародонта
- Разрушает мягкие ткани и костные структуры, поддерживающие зубы
- Основные последствия:
  - Патологическая подвижность зубов
  - Потеря зубов
  - Системное влияние на организм

Галитоз (неприятный запах изо рта) может быть вызван:

1. **Стоматологическими проблемами**:
   - Кариесом
   - Заболеваниями пародонта
2. **Неудовлетворительной гигиеной полости рта**:
   - Нерегулярной чисткой зубов
   - Скоплением зубного налёта
3. **Заболеваниями дёсен**:
   - Гингивитом
   - Пародонтитом
4. **Другими медицинскими состояниями**:
   - ЛОР-патологиями (синуситы, тонзиллиты)
   - Гастроэнтерологическими заболеваниями
   - Системными нарушениями (диабет, почечная недостаточность)

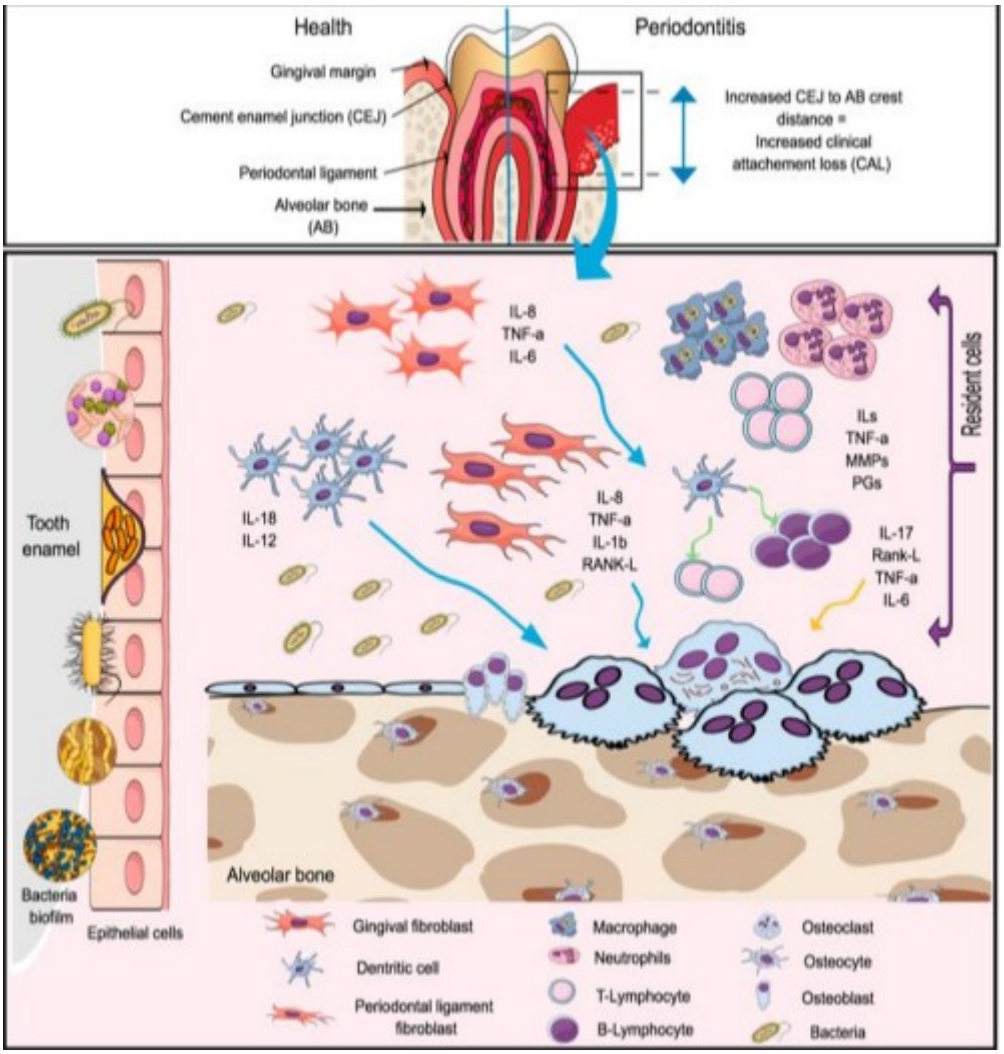
[5-7]

Значение гигиены полости рта в профилактике системных заболеваний

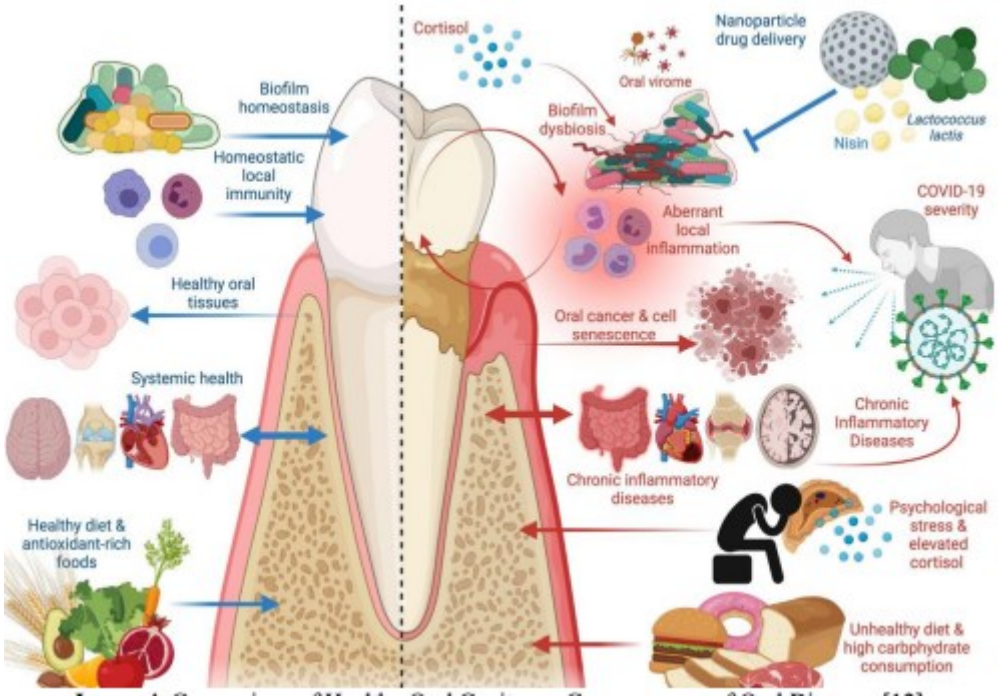
Правильная гигиена полости рта не только предотвращает заболевания полости рта, но и играет важную роль в профилактике системных заболеваний [7–9].

Бактерии, содержащиеся в зубном налёте, могут проникать в кровоток через поражённые ткани дёсен, достигая сердца и способствуя развитию таких состояний, как бактериальный эндокардит [7–9].

Воспаление и инфекции в полости рта могут влиять на контроль уровня сахара в крови, что затрудняет управление сахарным диабетом [10–12].



Изображение 3. Факторы, влияющие на здоровье полости рта [6]



Изображение 4. Сравнение здоровой полости рта и последствий заболеваний полости рта [12]

Пародонтальные заболевания связаны с преждевременными родами и низкой массой тела

новорождённого, что подчёркивает важность соблюдения гигиены полости рта во время беременности [11–12].

Связь между здоровьем полости рта и сердечно-сосудистыми заболеваниями

Существует несколько механизмов, посредством которых проблемы со здоровьем полости рта могут отрицательно влиять на здоровье сердца и наоборот. Понимание этих взаимосвязей помогает более эффективно предотвращать и лечить оба вида заболеваний [12–14].

Один из основных механизмов, с помощью которых заболевания полости рта влияют на сердце, — это воспаление. Пародонтит (воспаление и инфекция дёсен) вызывает не только локальное воспаление, но и системный воспалительный ответ. При инфицировании и воспалении тканей дёсен в кровоток попадают провоспалительные цитокины (такие как IL-6 и TNF-α), а также С-реактивный белок [14–16].

Основные механизмы влияния

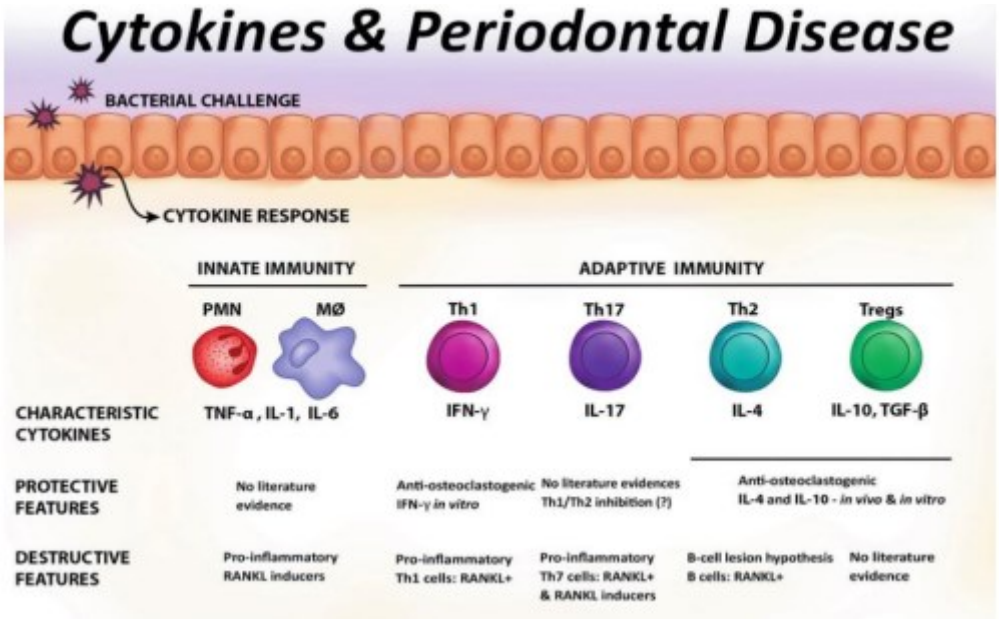
20. **Системное воспаление:** Пародонтит вызывает не только локальное воспаление, но и системный воспалительный ответ. Инфицированные ткани десен выделяют провоспалительные цитокины (например, IL-6 и TNF-α) и С-реактивный белок, которые способствуют образованию атеросклеротических бляшек [14-16].

21. **Бактериемия:** Бактерии из полости рта, такие как *Porphyromonas gingivalis* и *Streptococcus sanguinis*, могут попадать в кровоток и достигать сердца, вызывая эндокардит или другие инфекции [15,16].

22. В сердце эти бактерии могут колонизировать сердечные клапаны и способствовать развитию бактериального эндокардита — серьёзной инфекции внутренней оболочки сердечных камер и клапанов [15,16].

23. **Дисфункция эндотелия:** Хроническое воспаление ухудшает функцию эндотелия, что способствует развитию гипертонии и атеросклероза [15-17].

24. Провоспалительные цитокины, высвобождаемые из инфицированных тканей полости рта, могут вызывать эндотелиальную дисфункцию, которая является предшественником атеросклероза. Эндотелиальная дисфункция снижает способность кровеносных сосудов к нормальному расширению, что способствует развитию



Изображение 5. Роль цитокинов [16].

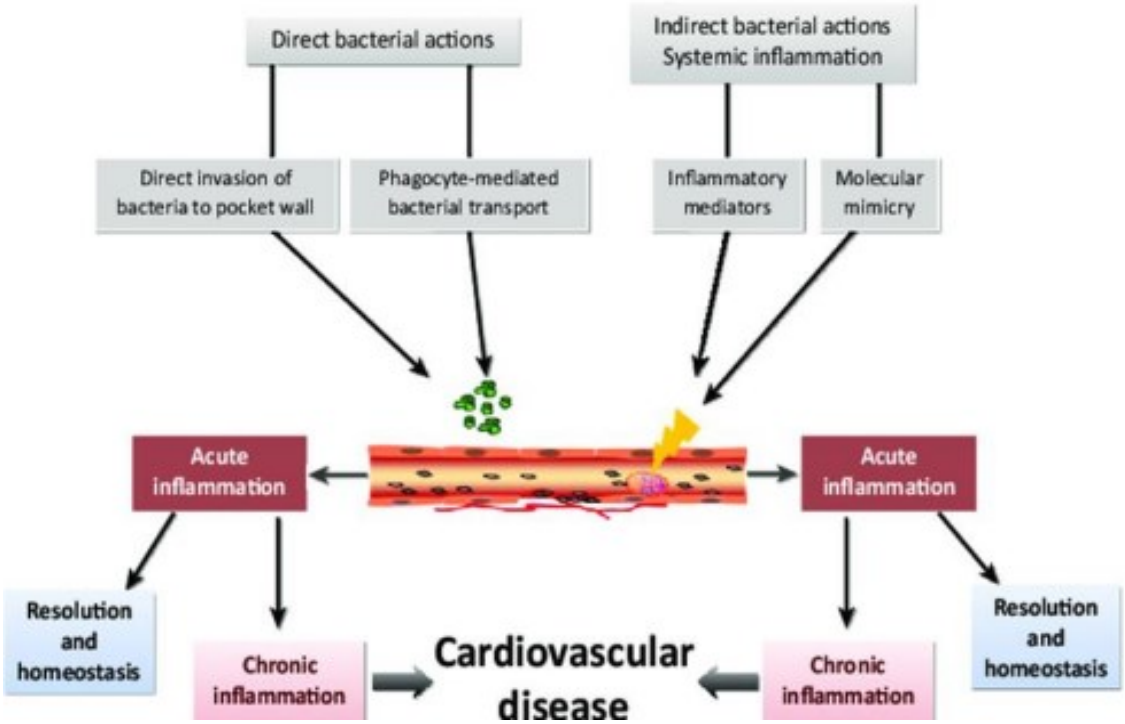
гипертонии и других сердечно-сосудистых заболеваний [15–17].

25. **Влияние на тромбообразование:** Оральные бактерии могут активировать агрегацию тромбоцитов, увеличивая риск тромбоза [16-18].

Бактерии полости рта также могут влиять на агрегацию тромбоцитов, увеличивая риск образования тромбов. Это может происходить напрямую — за счёт высвобождения токсинов бактериями, активирующими тромбоциты, — либо косвенно, через влияние на уровень факторов свёртывания крови в результате воспалительной реакции. Повышенное образование тромбов может приводить к закупорке артерий, увеличивая риск инфаркта миокарда и инсульта [16–18].

Сердечные заболевания, особенно те, которые поражают артерии и кровеносные сосуды, могут снижать кровоснабжение тканей полости рта, что ухудшает состояние дёсен и других тканей ротовой полости [16–18].

Некоторые препараты, применяемые для лечения сердечно-сосудистых заболеваний, такие как антигипертензивные средства или антикоагулянты, могут вызывать побочные эффекты, влияющие на здоровье полости рта, включая сухость во рту, что увеличивает восприимчивость к кариесу и инфекциям дёсен [16–18].



Изображение 6. Механизм взаимосвязи между заболеванием пародонта и сердечно-сосудистыми заболеваниями [18].

Управление и профилактика

Из-за доказанной связи между здоровьем полости рта и сердечно-сосудистыми заболеваниями эффективное управление здоровьем полости рта становится важным элементом профилактики сердечных заболеваний. Необходимо информировать пациентов о взаимосвязи между здоровьем полости рта и состоянием сердца. Пациенты должны понимать, что пренебрежение гигиеной полости рта может привести к серьёзным последствиям для сердечно-сосудистой системы [16–18].

Сердечные заболевания могут влиять на здоровье полости рта различными способами, в том числе через изменение кровотока, что может повлиять на заживление тканей и их восприимчивость к инфекциям. Одним из инновационных решений данной проблемы является использование наночастиц, содержащих эфирные масла, обеспечивающих замедленное высвобождение [19–24]. Эти наночастицы могут использоваться для лечения и профилактики заболеваний полости рта, так как они способны постепенно высвобождать активные вещества непосредственно в поражённой области, обеспечивая более эффективную и целенаправленную терапию. Это перспективное направление, сочетающее нанотехнологии с фитотерапией для улучшения состояния полости рта у пациентов с сердечно-сосудистыми заболеваниями [14–27].

Сердечные заболевания могут осложнять ортодонтическое лечение, повышая риск инфекций и ухудшая заживление. Ведение пациентов с сердечно-сосудистыми заболеваниями требует осторожного подхода,

адаптации техник и материалов с целью минимизации стресса и воспаления [28–33]. Междисциплинарное сотрудничество с кардиологами крайне важно для корректировки ортодонтического лечения, обеспечения тщательного мониторинга общего и стоматологического состояния, предотвращения осложнений и оптимизации результатов лечения в условиях наличия сердечно-сосудистых заболеваний [33].

Сердечно-сосудистые заболевания могут оказывать влияние на полость рта, поэтому параклинические исследования в стоматологии имеют решающее значение для раннего выявления осложнений. Выбор биосовместимых стоматологических материалов особенно важен для кардиологических пациентов, так как он снижает риск побочных эффектов и воспаления. Применение таких материалов минимизирует негативные взаимодействия, способствует заживлению и обеспечивает безопасную стоматологическую реабилитацию. Тесное сотрудничество между кардиологами и стоматологами имеет решающее значение для координации лечения и обеспечения максимально безопасных и эффективных решений по поддержанию здоровья полости рта в контексте сердечно-сосудистых заболеваний [34–45].

Обучение правильным методам чистки зубов, использованию зубной нити и другим средствам гигиены полости рта может значительно снизить частоту заболеваний ротовой полости и, косвенно, кардиологических осложнений [46–47].

Общая рекомендация заключается в том, что пациенты должны посещать стоматолога для профессионального осмотра и чистки каждые шесть месяцев. Пациенты с диагнозом «пародонтит» также должны проходить обследование на сердечно-сосудистые риски, так как воспаление и бактерии могут влиять на здоровье сердца [46–47].

Если у пациента одновременно имеются заболевания полости рта, связанные с сердцем, и другие общие заболевания, лечение должно проводиться совместно стоматологом и специалистом в области медицины с целью оптимизации результатов для здоровья пациента [46–47, 48–59].

Рекомендуется придерживаться здорового питания, богатого фруктами, овощами и клетчаткой, с низким содержанием сахаров и насыщенных жиров, а также вести активный образ жизни. Это необходимо для поддержания здоровья как полости рта, так и сердца [46–47].

Для пациентов с определёнными сердечными заболеваниями, у которых повышен риск развития бактериального эндокардита, может потребоваться приём антибиотиков перед стоматологическими процедурами, способными вызвать бактериемию [46–47, 60, 61].

Современные методы, такие как лазерная терапия или количественная оценка биомаркеров воспаления, могут сыграть важную роль в эффективном мониторинге и лечении пародонтита [46–47].

Выводы

Поддержание хорошей гигиены полости рта является важной стратегией не только для предотвращения кариеса и заболеваний дёсен, но и для снижения риска серьёзных сердечно-сосудистых заболеваний.

Сотрудничество между стоматологами и кардиологами имеет решающее значение для обеспечения комплексного ухода за пациентами, что может привести к раннему выявлению и более эффективному лечению потенциально связанных проблем со здоровьем.

Информирование пациентов о связи между здоровьем полости рта и заболеваниями сердца крайне важно. Осведомлённость об этой связи может мотивировать пациентов соблюдать лучшую гигиену полости рта и активно участвовать в профилактике долгосрочных проблем со здоровьем.

Соблюдение сбалансированного питания, регулярные физические нагрузки, отказ от курения и плановое прохождение медицинских осмотров являются рекомендациями, поддерживающими как здоровье полости рта, так и сердечно-сосудистой системы.

Поддерживая хорошее состояние полости рта и регулярно посещая стоматолога, вы можете значительно снизить риск сердечных осложнений, связанных с воспалением в полости рта и распространением бактерий. Это подчеркивает важность профилактического и междисциплинарного подхода к управлению здоровьем пациента.

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ВЛИЯНИЕ ПОСТА НА АКТИВАЦИЮ АУТОФАГИИ И ФИЗИОЛОГИЧЕСКОЕ СОСТОЯНИЕ ОРГАНИЗМА ЧЕЛОВЕКА

Аннотация: *в статье рассматриваются современные представления о влиянии поста на процессы аутофагии и физиологическое состояние организма человека. Проанализированы механизмы клеточной регуляции, активируемые в условиях ограниченного питания, а также обсуждены потенциальные положительные эффекты поста на метаболизм, иммунную систему и процессы старения.*

Ключевые слова: *аутофагия, пост, голодание, физиологическое состояние, метаболизм, клеточные механизмы, старение, интервальное голодание, регуляция, здоровье человека.*

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THE IMPACT OF FASTING AND ACTIVATION OF AUTOPHAGY AND THE PHYSIOLOGICAL STATE OF THE HUMAN BODY.

Abstract: *This article explores current perspectives on the effects of fasting on autophagy processes and the physiological state of the human body. It analyzes cellular regulatory mechanisms activated under conditions of restricted nutrition and discusses the potential beneficial effects of fasting on metabolism, the immune system, and aging processes.*

Keywords: *autophagy, fasting, caloric restriction, physiological state, metabolism, cellular mechanisms, aging, intermittent fasting, regulation, human health.*

Аутофагия — это слово, которое всё чаще звучит в разговорах о здоровье, долголетии и профилактике болезней. По сути, это естественный процесс «самоочистки» организма: клетки избавляются от повреждённых компонентов, перерабатывая их в энергию или строительный материал. Такой механизм помогает нам сохранять здоровье, укреплять иммунную систему и даже замедлять старение.

В последнее время к аутофагии стали проявлять всё больший интерес не только учёные, но и обычные люди, стремящиеся улучшить самочувствие с помощью простых и доступных методов. Один из таких методов — это голодание. Многие слышали о «интервальном» питании или популярной схеме 16/8, кто-то пробовал более строгие варианты вроде ОМАД (одноразовое питание в день) или даже многодневных постов.

Актуальность темы: в условиях роста хронических заболеваний и ухудшения метаболического здоровья интерес к естественным методам поддержки организма возрастает. Аутофагия — один из ключевых механизмов клеточного очищения и восстановления. Исследования показывают, что её активация через практики голодания может снижать риск возрастных заболеваний, улучшать обмен веществ и поддерживать иммунитет. Поэтому изучение влияния различных режимов голодания на аутофагию приобретает особую значимость в контексте профилактики и укрепления здоровья.

Цель статьи: проанализировать современные научные данные о влиянии голодания на активацию аутофагии и физиологическое состояние организма человека.

Обзор литературы. Аутофагия и её регуляция

Аутофагия — это эволюционно консервативный механизм, обеспечивающий деградацию и переработку повреждённых или ненужных клеточных компонентов. Ключевыми регуляторами аутофагии являются сигнальные пути **mTOR**[1] и **AMPK**[2]. Снижение активности mTOR и активация AMPK способствуют индукции аутофагии, особенно в условиях энергетического дефицита, как при посте.

- **Влияние поста на аутофагию :** запуск аутофагии при посте связан с понижением уровня глюкозы, инсулина и аминокислот в крови, а также с активацией энергетических сенсоров клетки — таких как AMPK (5’-аденозинмонофосфат-активируемая протеинкиназа) и ингибицией сигнального пути mTOR (механистическая мишень рапамицина). Именно подавление mTOR считается ключевым сигналом для начала аутофагического каскада.

mTOR[1]- (mammalian Target of Rapamycin) подавляется во время поста, и это запускает аутофагию.

AMPK[2] – (Activated Protein Kinase) активируется при дефиците энергии.

Внутри клетки начинается формирование аутофагосом — мембранных пузырьков, которые захватывают повреждённые структуры. Эти аутофагосомы затем сливаются с лизосомами, в которых происходит расщепление содержимого до простых соединений. Таким образом, клетка не

только избавляется от потенциально токсичных элементов, но и получает источники энергии в условиях дефицита питательных веществ.

Физиологические эффекты поста

Помимо запуска аутофагии, голодание оказывает заметное влияние на другие важные процессы в организме. При ограничении питания происходят значительные метаболические перестройки, направленные на адаптацию к дефициту энергии. Организм начинает активнее использовать внутренние ресурсы, снижая уровень глюкозы и инсулина, что может способствовать улучшению чувствительности к инсулину и снижению риска метаболических нарушений, таких как сахарный диабет 2 типа.

Интересны и данные о влиянии голодания на иммунную систему. Некоторые исследования показывают, что кратковременное голодание способствует «перезагрузке» иммунных клеток и даже стимулирует выработку новых, благодаря активации стволовых клеток в костном мозге. Это особенно актуально для людей, чья иммунная система ослаблена хроническими заболеваниями или возрастными изменениями.

Что касается процессов старения, то регулярное включение голодания в образ жизни может замедлять возрастные изменения. Снижение уровня воспаления, улучшение работы митохондрий и усиление аутофагии в комплексе способствуют продлению жизни клеток и сохранению их функциональности. Всё это делает голодание не просто средством для контроля веса, а потенциально важным элементом профилактики возрастных заболеваний, таких как болезнь Альцгеймера, сердечно-сосудистые расстройства и онкологические процессы.

Заключение: пост является эффективным инструментом активации аутофагии, способствуя улучшению физиологического состояния организма. На основе современных исследований можно утверждать, умеренное и контролируемое голодание может быть использовано как эффективный метод для поддержания здоровья, профилактика возрастных и метаболических заболеваний.

Рекомендации. Провести клинические исследования, анализы.

- Разработать оптимальные режимы поста (длительность, частота).
- При наличии хронических заболеваний (диабет, анемии, желудочно-кишечных патологий) не следует голодать.
- В период болезни или интенсивных нагрузок, не перегружать организм, приостановить пост.
- Поддержание водного баланса и достаточное потребление соли, микроэлементов (предотвращения головокружения, слабости).

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ИЗМЕНЕНИЯ ЛИМФОИДНЫХ СТРУКТУР ДЫХАТЕЛЬНЫХ ПУТЕЙ У ПОТОМСТВА ПРИ ХРОНИЧЕСКОМ ВОЗДЕЙСТВИИ ЗАГРЯЗНЁННОГО ВОЗДУХА

Аннотация. *Хроническое воздействие загрязнителей воздуха, особенно в антенатальном и раннем постнатальном периодах, оказывает выраженное влияние на формирование лимфоидных структур в стенке дыхательных путей у потомства. Объектом особого внимания является бронхиальная ассоциированная лимфоидная ткань (BALT), которая представляет собой ключевой компонент системы слизистого иммунитета. Данный обзор обобщает и систематизирует результаты современных морфологических, иммуноморфологических и морфометрических исследований, посвящённых изменениям структуры и организации BALT у потомства животных и человека под влиянием хронической ингаляционной экспозиции аэрополлютантов. Анализируются изменения в клеточном составе, архитектонике лимфоидных фолликулов, сосудистой сети, а также морфофункциональные последствия указанных нарушений для респираторного иммунитета.*

Ключевые слова: *загрязнение воздуха, лимфоидная ткань, BALT, дыхательные пути, морфология, постнатальное развитие, иммунная система, аэрополлютанты*

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CHANGES IN THE LYMPHOID STRUCTURES OF THE RESPIRATORY TRACT IN OFFSPRING UNDER CHRONIC EXPOSURE TO POLLUTED AIR

Abstract. *Chronic exposure to air pollutants, especially during antenatal and early postnatal periods, has a pronounced impact on the formation of lymphoid structures in the respiratory tract wall of the offspring. Of particular interest is the bronchus-associated lymphoid tissue (BALT), a key component of the mucosal immune system. This review summarizes and systematizes the findings of recent*

morphological, immunomorphological, and morphometric studies devoted to changes in the structure and organization of BALT in animal and human offspring under chronic inhalation exposure to air pollutants. The review analyzes alterations in cellular composition, lymphoid follicle architecture, vascular network, as well as the morphofunctional consequences of these changes for respiratory immunity.

Keywords: *air pollution, lymphoid tissue, BALT, respiratory tract, morphology, postnatal development, immune system, air pollutants*

Воздействие загрязнённого воздуха является одним из ведущих факторов риска, способствующих развитию респираторной патологии в детском возрасте. Наиболее уязвимыми к воздействию аэрополлютантов являются плоды и новорождённые, у которых продолжается морфогенез ключевых структур дыхательной и иммунной систем. Среди них особое значение имеет бронхиальная ассоциированная лимфоидная ткань (BALT), формирующаяся в постнатальном онтогенезе и обеспечивающая иммунную защиту дыхательных путей. BALT представляет собой специализированный лимфоидный орган, включающий фолликулярные и интерфолликулярные скопления лимфоцитов, локализованные в стенке бронхов и бронхиол [1,2].

Изучение гистоморфологических изменений BALT под воздействием аэрополлютантов, таких как твёрдые частицы (PM2.5, PM10), оксиды азота и серы, бензол, диоксины, формальдегид и другие компоненты, позволяет понять механизмы формирования нарушений мукозального иммунитета у потомства и их возможную связь с последующим развитием хронических воспалительных заболеваний дыхательных путей[3,4].

Материалы и методы: Проведён систематический обзор научной литературы, опубликованной в период 2000–2025 гг., с использованием баз данных PubMed, Scopus и eLibrary [5,6]. В отбор включались экспериментальные исследования на животных (крысы, мыши, морские свинки) и клинические морфологические исследования у детей, в которых проводился анализ гистологических и иммуногистохимических изменений лимфоидной ткани дыхательных путей при хроническом воздействии загрязнённого воздуха. Особое внимание уделялось работам, включающим световую, электронной и конфокальной микроскопию, а также морфометрию лимфоидных структур.

Результаты и обсуждение:

1. Гистогенез и нормальная морфология BALT у новорождённых

В нормальных условиях BALT начинает формироваться в постнатальном периоде под действием антигенной стимуляции. Первичные фолликулы обнаруживаются на 7–10 сутки жизни, а зрелые вторичные фолликулы — к 3–4 неделе. Морфологически BALT состоит из лимфоидных фолликулов, содержащих преимущественно В-лимфоциты, и интерфолликулярных зон, богатых Т-клетками и антиген-презентирующими клетками (дендритными клетками, макрофагами). Структуры BALT тесно

ассоциированы с сосудистыми и лимфатическими капиллярами, обеспечивающими транспорт иммунокомпетентных клеток.

2. Морфологические изменения BALT при воздействии аэрополлютантов.

У потомства, подвергавшегося хроническому воздействию загрязнённого воздуха, наблюдаются выраженные морфологические нарушения в структуре BALT:

- уменьшение числа и площади лимфоидных фолликулов;
- нарушение зональной дифференцировки фолликулов (нечёткая граница между центром размножения и мантией);
- редукция Т-зависимых зон;
- снижение плотности лимфоидных инфильтратов в подслизистом слое;
- признаки апоптоза лимфоцитов и снижение митотической активности в герминативных центрах;
- уменьшение количества М-клеток и антиген-презентирующих клеток в области купола;
- нарушение архитектоники сосудисто-капиллярной сети.

3. Иммуногистохимические и морфометрические особенности

Иммуногистохимически выявляется снижение экспрессии CD3+ и CD20+ клеток, снижение содержания маркёров активности (Ki-67, Bcl-6), уменьшение экспрессии молекул адгезии (ICAM-1, VCAM-1). Морфометрия показывает достоверное уменьшение площади фолликулов, плотности клеток, соотношения В/Т-лимфоцитов. Такие изменения коррелируют с повышенным уровнем провоспалительных цитокинов в ткани лёгких (TNF-α, IL-1β, IL-6).

4. Функциональные последствия морфологических нарушений

Вышеописанные изменения лимфоидной ткани сопровождаются снижением локального иммунного ответа, повышенной проницаемостью эпителия, замедленным элиминационным ответом на патогены, а также дисбалансом между провоспалительными и противовоспалительными медиаторами. Установлена корреляция между нарушениями BALT и повышенной частотой инфекционных и аллергических заболеваний у детей.

Заключение: Хроническое воздействие загрязнённого воздуха в антенатальном и раннем постнатальном периодах приводит к выраженным морфологическим и функциональным изменениям бронхиальной лимфоидной ткани у потомства. Нарушение структуры BALT ведёт к снижению эффективности местного иммунного надзора и может рассматриваться как один из патогенетических факторов формирования хронических воспалительных заболеваний дыхательной системы. Дальнейшие исследования должны быть направлены на детальное изучение молекулярных механизмов указанных нарушений и поиск способов коррекции нарушенного морфогенеза иммунных структур [7,8].

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ИНФОРМАЦИОННЫЕ И КОММУНИКАТИВНЫЕ ТЕХНОЛОГИИ

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KLASSIK MCELIECE ALGORITMMI: POSTKVANT KRIPTOGRAFIYASIDA KODLARGA ASOSLANGAN SHIFRLASH

Annotatsiya: *Classic McEliece algoritmi kodga asoslangan kriptografiya sohasida uzoq vaqt sinovdan o'tgan algoritm bo'lib, sindromni dekodlash muammosiga asoslanadi. Maqola algoritmning matematik asoslari, kalit generatsiyasi, shifrlash va deshifrlash jarayonlarini batafsil yoritadi, shuningdek, xavfsizlik tahlili va amaliy qo'llanilishini muhokama qiladi.*

Kalit so'zlar*: Classic McEliece, post-kvant kriptografiyasi, Goppa kodlari, sindromni dekodlash, shifrlash, kvant chidamliligi.*

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CLASSIC MCELIECE ALGORITHM: CODE-BASED ENCRYPTION IN POST-QUANTUM CRYPTOGRAPHY

Abstract: *The Classic McEliece algorithm is a time-tested code-based cryptographic algorithm that relies on the syndrome decoding problem. This article provides a detailed explanation of the algorithm's mathematical foundations, key generation, encryption, and decryption processes, as well as an analysis of its security and practical applications.*

Keywords*: Classic McEliece, post-quantum cryptography, Goppa codes, syndrome decoding, encryption, quantum resistance.*

Kirish

So'nggi o'n yilliklarda kvant kompyuterlari sohasidagi yutuqlar an'anaviy kriptografik tizimlarga jiddiy xavf solmoqda. Post-kvant kriptografiyasi (PQC) bu muammolarni hal qilish uchun kvant va klassik hujumlarga chidamli algoritmlarni ishlab chiqishga qaratilgan. PQC algoritmlari turli matematik muammolarga asoslanadi, masalan, lattis muammolari, sindromni dekodlash va hash funktsiyalari.

Kvant kompyuterlarining rivojlanishi an’anaviy umumiy kalitli shifrlash tizimlariga, masalan, RSA va ECC (Elliptic Curve Cryptography) algoritmlariga jiddiy xavf tug‘dirmoqda. Shor algoritmi diskret logarifm va faktorizatsiya muammolarini polinomial vaqtda yechish imkonini beradi, bu esa an’anaviy shifrlash tizimlarini zaiflashtiradi. [159]Shu sababli, post-kvant kriptografiyasi sohasi faol rivojlanmoqda, unda kvant hujumlariga chidamli algoritmlar ishlab chiqilmoqda. Classic McEliece algoritmi, 1978-yilda Robert McEliece tomonidan taklif qilingan, kodga asoslangan kriptografiya sohasida muhim o‘rin tutadi. U binar Goppa kodlariga asoslanib, sindromni dekodlash muammosining NP-complete murakkabligidan foydalanadi. Bu xususiyati uni post-kvant kriptografiyasida eng ishonchli algoritmlardan biriga aylantiradi.

Matematik asoslari

• **Goppa kodlari:** Goppa kodlari $GF(2^m)$ Galua maydonida aniqlangan xatolar tuzatish kodlari bo‘lib, quyidagi parametrlarga ega:

– Uzunlik: $n = 2^m$,

– O‘lcham: $k \geq n - mt$,

– Xato tuzatish qobiliyati: t.[160]

Goppa kodlari xato tuzatishda yuqori samaradorlikka ega bo‘lib, Classic McEliece algoritmining asosini tashkil qiladi.

• **Sindromni dekodlash:** Berilgan H tekshiruv matritsasi va sindrom $s = He^T$ uchun og‘irligi $\leq t$ bo‘lgan e xato vektorini topish muammosi. Bu muammo NP-complete sifatida tasniflanadi va kvant kompyuterlari uchun ham yechimi qiyin hisoblanadi.

• **Parametrlar:** Masalan, m = 12, n = 4096, t = 128 kabi parametrlar 256-bit xavfsizlik darajasini ta’minlaydi, bu esa zamonaviy xavfsizlik talablariga mos keladi.

Algoritm tuzish

1. Kalit generatsiyasi:

• Tasodifiy $g(x)$ Goppa polinomi (darajasi t) tanlanadi.

• G generatsiya matritsasi Goppa kodi asosida yaratiladi.

• Maxfiy kalit: $(S, g(x), P)$, bu erda $S - k \times k$ invertalanadigan matritsa, $P - n \times n$ almashinuv matritsasi.

• Umumiykalit: $G' = SGP$, bu erda G' umumiy kalit sifatida nashr qilinadi.

2. Shifrlash:

• Xabar m (uzunligi k-bit) va tasodifiy xato vektori e (og‘irligi $\leq t$) tanlanadi.

• Shifrlangan matn: $c = mG' + e$.[161]

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[159] Amirkulov Ch.J., Normurodov Ch.B. (2020). *Навье – Стокс тенгламаларининг айрим хусусий ечимлари ҳақида*. Интернаука, 4(16)

[160] **Kholyorov Erkin, Turayev Dilmurod, Buriyev Javokhir** (2024). *Numerical solution of boundary inverse problem for fluid relaxation filtration in porous media*. AIP Conference Proceedings, https://doi.org/10.1063/5.0241626.

[161] **Normurodov Chori Begaliyevich, Turaev Dilmurod Shokirovich, Jabborov Ilyor Yuldashevich, Buriev Javoxir Nosirovich, Jonqobilov Mirjalol Bakhtiyorovich** (2021). *Definition of Different Schemes for Calculation of General Solutions*. Nashr ma'lumotlari aniq emas (konferensiya yoki jurnal ma'lumotlari keltirilmagan).

3. Deshifrlash:

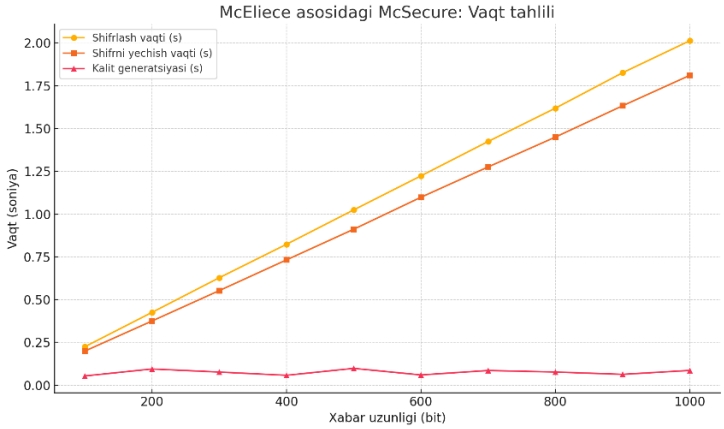
• cP^{-1} hisoblanadi.

• Goppadekodlash algoritmi (masalan, Patterson algoritmi) yordamida mS olinadi.

• Asl xabar $m = (mS)S^{-1}$orqali tiklanadi[162].

Natijalar

• Xavfsizlik: Classic McEliece algoritmi sindromni dekodlash muammosiga asoslangan xavfsizligi kvant hujumlariga chidamli. Grover algoritmi qidiruvni kvadrat ildiz darajasida tezlashtirsada, katta parametrlar (masalan, n = 4096,t = 128) xavfsizlikni ta'minlaydi.



1-rasm. Algoritm taxliliy natijalari

• Samaradorlik: Shifrlash jarayoni(matritsa ko'paytirish) va deshifrlash (Goppa dekodlash) yuqori tezlikda amalga oshiriladi.

• Amaliy qo'llanilishi: Algoritm uzoqmuddatli ma'lumotlar himoyasi(masalan, maxfiy hujjatlar, davlat tizimlari) va maxfiy aloqa tarmoqlari uchun ideal.

• Cheklovlar: Umumiy kalit o'lchami(1MB) katta bo'lib, bu IoT kabi resursi cheklangan muhitlarda qo'llanilishini qiyinlashtiradi.

Tahlil

• **Xavfsizlik tahlili:** Algoritmning xavfsizligi sindromni dekodlash muammosining matematik murakkabligiga asoslanadi. Eng samarali hujum Information Set Decoding (ISD)– katta hisoblash resurslarini talab qiladi.

• **Samaradorlik tahlili:** Algoritmning shifrlash va deshifrlash jarayonlari o'ta samarali bo'lib, matritsa ko'paytirish va Goppa dekodlash algoritmlari minimal hisoblash resurslarini talab qiladi.

• **Taqqoslash:** CRYSTALS-Kyber va CRYSTALS-Dilithium kabi lattisga asoslangan algoritmlar kichikroq kalit o'lchamlari bilan raqobatlashadi.

[162] **Kholyorov Erkin, Turayev Dilmurod, Buriyev Javokhir** (2024). *Численное решение граничной обратной задачи для уравнения релаксационной фильтрации*. Проблемы вычислительной и прикладной математики

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7. Kholyorov Erkin, Turayev Dilmurod, Buriyev Javokhir (2024). *Numerical solution of boundary inverse problem for fluid relaxation filtration in porous media*. AIP Conference Proceedings, https://doi.org/10.1063/5.0241626.
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ADO.NET TEXNOLOGIYASI VA ENTITY FRAMEWORK TEXNOLOGIYALARI FARQI, AFZALLIKLARI, KAMCHILIKLARI

Annotatsiya: *Ushbu maqola C# dasturlash tilida ma’lumotlar bazasi bilan ishlash uchun ishlatiladigan ikki asosiy texnologiya – ADO.NET va Entity Frameworkning nazariy taqqoslashini, afzalliklari va kamchiliklarini tahlil qiladi. ADO.NETning past darajali, yuqori samarali yondashuvi va Entity Frameworkning obyekt-relatsion xaritalash (ORM) asosidagi soddalashtirilgan usuli solishtiriladi. Maqola har bir texnologiyaning xususiyatlarini, moslashuvchanligini va qo‘llanilish sohasini ko‘rib chiqadi. Qo‘shimcha ravishda, ma’lumotlar bazasida o‘qish, qo‘shish, yangilash va o‘chirish kabi asosiy operatsiyalarni amalga oshirish uchun ADO.NET va Entity Framework yordamida bir nechta amaliy misollar keltirilgan.*

Kalit so‘zlar: *ADO.NET, Entity Framework, Ma’lumotlar bazasi, C# dasturlash tili, Obyekt-relatsion xaritalash (ORM), SQL so‘rovlari, Samaradorlik, Xavfsizlik, Kod soddaligi, Ma’lumotlarni o‘qish, Ma’lumotlarni qo‘shish, Ma’lumotlarni yangilash, Ma’lumotlarni o‘chirish.*

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THE DIFFERENCE, ADVANTAGES AND DISADVANTAGES OF ADO.NET AND ENTITY FRAMEWORK TECHNOLOGIES

Annotation: *This article analyzes the theoretical comparison, advantages, and disadvantages of two primary technologies used for working with databases in the C# programming language – ADO.NET and Entity Framework. The low-level, high-performance approach of ADO.NET is compared with the simplified object-relational mapping (ORM) approach of Entity Framework. The article examines the characteristics, flexibility, and application areas of each technology. Additionally, several practical examples are provided, demonstrating basic database operations such as reading, inserting, updating, and deleting using ADO.NET and Entity Framework.*

Key words: *ADO.NET, Entity Framework, Database, C# programming, Object-Relational Mapping (ORM), SQL queries, Performance, Security, Code simplicity, Data reading, Data insertion, Data updating, Data deletion.*

Ma’lumotlar bazasi bilan ishlash zamonaviy dasturiy ta’minot ishlab chiqishda muhim ahamiyatga ega. C# dasturlash[163] tilida ma’lumotlar bazasi bilan ishlash uchun bir nechta texnologiyalar mavjud bo‘lcib, ulardan eng muhimlari ADO.NET va Entity Framework hisoblanadi. Ushbu maqola ADO.NET va Entity Framework texnologiyalarining farqlari, afzalliklari va kamchiliklarini nazariy jihatdan tahlil qiladi va kengaytirilgan amaliy misollar orqali ularning qo‘llanilishini ko‘rsatadi. Maqola oliy ta’lim darajasidagi talabalar va dasturchilar uchun mo‘ljallangan bo‘lib, texnik jihatlarni aniq va tushunarli tarzda ochib beradi.

ADO.NET haqida umumiy ma’lumot. ADO.NET (ActiveX Data Objects .NET) Microsoft tomonidan .NET Framework doirasida ma’lumotlar bazasi bilan ishlash uchun ishlab chiqilgan past darajali texnologiyadir. U ma’lumotlar bazasiga to‘g‘ridan-to‘g‘ri ulanish, SQL so‘rovlarni bajarish va ma’lumotlarni qayta ishlash imkonini beradi. ADO.NET asosan quyidagi asosiy komponentlardan iborat. Masalan: **Connection**: Ma’lumotlar bazasiga ulanishni ta’minlaydi (masalan, SqlConnection), **Command**: SQL so‘rovlarni bajarish uchun ishlatiladi (SqlCommand), **DataReader**: Ma’lumotlarni o‘qish uchun tezkor, faqat oldinga yo‘naltirilgan oqim sifatida ishlaydi, **DataAdapter**: Ma’lumotlar bazasi va DataSet yoki DataTable o‘rtasida ko‘prik vazifasini o‘taydi, **DataSet**: Ma’lumotlar bazasidan mustaqil[164] ravishda ma’lumotlarni xotirada saqlash va qayta ishlash uchun ishlatiladi.

ADO.NET past darajali bo‘lib, dasturchiga ma’lumotlar bazasi bilan ishlashda to‘liq nazoratni ta’minlaydi, ammo bu ko‘proq kod yozishni talab qiladi.

Afzalliklariga yuqori samaradorlik, moslashuvchanlik, to‘liq nazorat, resurslardan samarali foydalanish kbi xususiyatlari misol bo‘la oladi.

Kamchiliklariga murakkabli, xavfsizlik muammolari, obyektga yo‘naltirilgan emasligini misol qilib aytishimiz mumkin.

Entity Framework haqida umumiy ma’lumot. Entity Framework (EF) Microsoft tomonidan ishlab chiqilgan obyekt-relatsion xaritalash (ORM - Object-Relational Mapping) texnologiyasidir. U ma’lumotlar bazasi bilan ishlashni soddalashtirish uchun mo‘ljallangan bo‘lib, dasturchilarga ma’lumotlar bazasi bilan ishlashda obyektga yo‘naltirilgan yondashuvni qo‘llash imkonini beradi. EF ma’lumotlar bazasi tuzilmasini C# klasslari sifatida ifodalaydi va SQL so‘rovlarni avtomatik ravishda generatsiya qiladi.

Entity Frameworkning asosiy yondashuvlari bu Code First(Ma’lumotlar bazasi tuzilmasi C# kodidan generatsiya qilinadi), Database First(Mavjud

[163] Buriyev J. N. (2024). WINDOWS FORMS .NET ILOVALARNING DIZAYNIDA UI/UX FRAMEWORKLARINING AFZALLIKLARI. Ekonomika va Sotsium Jurnali.c

[164] Kholyorov Erkin, Turayev Dilmurod, Buriyev Javokhir (2024). Numerical solution of boundary inverse problem for fluid relaxation filtration in porous media

ma’lumotlar bazasidan model yaratiladi), Model First(Dizayner yordamida model yaratiladi va undan ma’lumotlar bazasi generatsiya qilinadi)

Afzalliklari bu soddalashtirilgan ishlab chiqish, xavfsizlik, avtomatlashtirish, obyektga yo‘naltirilgan yondashuv.

Kamchiliklari bu samaradorlik, murakkab so‘rovlar, o‘rganishning murakkabligi.

1-jadval.

Jihatlari	ADO.NET	Entity Framework
Yondashuv	Past darajali, SQL-ga asoslangan	Yuqori darajali, obyekt-relatsion xaritalash
Kod miqdori	Ko‘p kod yozish talab qilinadi	Kamroq kod, avtomatlashtirilgan so‘rovlar
Samaradorlik	Yuqori, optimallashtirilgan so‘rovlar	O‘rtacha, avtomatik so‘Acq so‘rovlar optimalligi past
Xavfsizlik	SQL Injection xavfi yuqori	SQL Injection xavfi past
Moslashuvchanlik	Har qanday ma’lumotlar bazasi bilan ishlaydi	Ko‘proq SQL Server bilan integratsiyalashgan
Obyektga yo‘naltirilganlik	Yo‘q, qo‘lda konvertatsiya talab qilinadi	Ha, ma’lumotlar C# obyektlari sifatida ishlatiladi

Quyida ADO.NET va Entity Framework yordamida ma’lumotlar bazasi bilan ishlashning bir nechta sodda misollarni keltirib o‘tamiz. Ushbu misollar turli operatsiyalarni (o‘qish, qo‘shish, yangilash va o‘chirish) ko‘rsatadi.

ADO.NET bilan ma’lumotlarni o‘qishga misollar. Quyida SQL Server ma’lumotlar bazasidan Students jadvalidan ma’lumotlarni o‘qish uchun ADO.NET yordamida misol keltiramiz:

```
using System;
using System.Data.SqlClient;
internal class Program1
{
   static void Main()
   {
      string connectionString =
"Server=localhost;Database=SchoolDB;Trusted_Connection=True;";
      using (SqlConnection connection = new
SqlConnection(connectionString))
      {
         try
         {
            connection.Open();
            string query = "SELECT Id, FirstName, LastName FROM
Students";
            SqlCommand command = new SqlCommand(query, connection);
```

```
                using (SqlDataReader reader = command.ExecuteReader())
                {
                    while (reader.Read())
                    {
                        Console.WriteLine($"ID: {reader["Id"]}, Name:
{reader["FirstName"]} {reader["LastName"]}");
                    }
                }
            }
            catch (Exception ex)
            {
                Console.WriteLine("Error: " + ex.Message);
            }
        }
    }
}
```

Ushbu misolda SqlConnection orqali ma'lumotlar bazasiga ulanadi, SqlCommand yordamida SQL so'rovi bajariladi va SqlDataReader yordamida natijalar o'qiladi. Kod past darajali bo'lib, har bir qadam dasturchi tomonidan qo'lda boshqariladi.

Ma'lumot qo'shish. Quyida yangi talaba ma'lumotini Students jadvaliga qo'shish uchun ADO.NET misoli keltirilgan:

```
using System;
using System.Data.SqlClient;
class Program
{
    static void Main()
    {
        string connectionString =
"Server=localhost;Database=SchoolDB;Trusted_Connection=True;";

        using (SqlConnection connection = new
SqlConnection(connectionString))
        {
            try
            {
                connection.Open();
                string query = "INSERT INTO Students (FirstName, LastName)
VALUES (@FirstName, @LastName)";
                SqlCommand command = new SqlCommand(query, connection);

                command.Parameters.AddWithValue("@FirstName", "Ali");
                command.Parameters.AddWithValue("@LastName", "Valiyev");
```

```
                int rowsAffected = command.ExecuteNonQuery();
                Console.WriteLine($"{rowsAffected} row(s) inserted.");
            }
            catch (Exception ex)
            {
                Console.WriteLine("Error: " + ex.Message);
            }
        }
    }
}
```

Bu misolda SqlCommand obyektiga parametrlashtirilgan so‘rov yuboriladi, bu SQL Injection xavfini kamaytiradi. ExecuteNonQuery metodi ma’lumot qo‘shish kabi o‘zgartirish operatsiyalari uchun ishlatiladi.

Ma’lumotni yangilash. Quyida Students jadvalidagi talabaning ismini yangilash misoli keltirilgan:

```
using System;
using System.Data.SqlClient;
class Program
{
    static void Main()
    {
        string connectionString =
"Server=localhost;Database=SchoolDB;Trusted_Connection=True;";
        using (SqlConnection connection = new
SqlConnection(connectionString))
        {
            try
            {
                connection.Open();
                string query = "UPDATE Students SET FirstName = @FirstName
WHERE Id = @Id";
                SqlCommand command = new SqlCommand(query, connection);

                command.Parameters.AddWithValue("@FirstName", "Bobur");
                command.Parameters.AddWithValue("@Id", 1);

                int rowsAffected = command.ExecuteNonQuery();
                Console.WriteLine($"{rowsAffected} row(s) updated.");
            }
            catch (Exception ex)
            {
                Console.WriteLine("Error: " + ex.Message);
            }
        }
```

```
        }
    }
```

Ushbu misolda ma’lumotni yangilash uchun UPDATE so‘rovi ishlatiladi. Parametrlashtirilgan so‘rovlar xavfsizlikni[165] oshiradi va kodni yanada mustahkam qiladi.

Endi xuddi shu amallarni Entity Framework texnologiyasi orqali amalga oshirishni ko‘rib chiqishimiz mumkin. Quyida Students jadvalidan ma’lumotlarni o‘qish uchun Entity Framework (Code First) misoli keltirilgan:

```
using System;
using System.Linq;
using Microsoft.EntityFrameworkCore;
public class Student
{
    public int Id { get; set; }
    public string FirstName { get; set; }
    public string LastName { get; set; }
}
public class SchoolContext : DbContext
{
    public DbSet<Student> Students { get; set; }
    protected override void OnConfiguring(DbContextOptionsBuilder
optionsBuilder)
    {
optionsBuilder.UseSqlServer("Server=localhost;Database=SchoolDB;Trusted_Co
nnection=True;");
    }
}
class Program
{
    static void Main()
    {
        using (var context = new SchoolContext())
        {
            var students = context.Students.ToList();
            foreach (var student in students)
            {
                Console.WriteLine($"ID: {student.Id}, Name:
{student.FirstName} {student.LastName}");
            }
        }
    }
```

[165] Amirkulov Ch.J., Normurodov Ch.B. (2020). Навье – Стокс тенгламаларининг айрим хусусий ечимлари ҳақида. Интернаука, 4(16)

```
}
```

Bu misolda DbContext va LINQ yordamida ma’lumotlar[166] o‘qiladi. Kod soddaligi va obyektga yo‘naltirilgan yondashuvi tufayli tushunarli va qisqa.

Ma’lumot qo‘shish. Quyida yangi talaba qo‘shish uchun Entity Framework misoli keltiriladi.

```
using System;
using Microsoft.EntityFrameworkCore;
public class Student
{
    public int Id { get; set; }
    public string FirstName { get; set; }
    public string LastName { get; set; }
}
public class SchoolContext : DbContext
{
    public DbSet<Student> Students { get; set; }

    protected override void OnConfiguring(DbContextOptionsBuilder
optionsBuilder)
    {
optionsBuilder.UseSqlServer("Server=localhost;Database=SchoolDB;Trusted_Co
nnection=True;");
    }
}
class Program
{
    static void Main()
    {
        using (var context = new SchoolContext())
        {
            var newStudent = new Student { FirstName = "Ali", LastName =
"Valiyev" };
            context.Students.Add(newStudent);
            context.SaveChanges();
            Console.WriteLine("New student added.");
        }
    }
}
```

[166] Normurodov Chori Begaliyevich, Toyirov Akbar Khasanovich, Amirkulov Chori Jumayevich, Abdullaev Bakhtiyor Panji O’g’li (2020). Mathematical Modeling of the Hydrodynamic Stability Problem by the Spectral-grid Method. International Journal of Innovations in Engineering Research and Technology.

Add metodi va SaveChanges yordamida[167] yangi ma’lumot qo‘shiladi. Entity Framework avtomatik ravishda kerakli SQL so‘rovini generatsiya qiladi.

Ma’lumotni yangilash. Quyida mavjud talabaning ismini yangilash misoli keltirilgan:

```
using System;
using System.Linq;
using Microsoft.EntityFrameworkCore;
public class Student
{
    public int Id { get; set; }
    public string FirstName { get; set; }
    public string LastName { get; set; }
}
public class SchoolContext : DbContext
{
    public DbSet<Student> Students { get; set; }
    protected override void OnConfiguring(DbContextOptionsBuilder
optionsBuilder)
    {
optionsBuilder.UseSqlServer("Server=localhost;Database=SchoolDB;Trusted_Co
nnection=True;");
    }
}
class Program
{
    static void Main()
    {
        using (var context = new SchoolContext())
        {
            var student = context.Students.FirstOrDefault(s => s.Id == 1);
            if (student != null)
            {
                student.FirstName = "Bobur";
                context.SaveChanges();
                Console.WriteLine("Student updated.");
            }
            else
            {
                Console.WriteLine("Student not found.");
            }
        }
```

[167] Smith, J. (2020). "ADO.NET vs Entity Framework: A Comparative Analysis." Journal of Software Development, 15(3), 45-52.

```
        }
    }
```

Bu yerda LINQ yordamida talaba topiladi va uning xususiyatlari o‘zgartiriladi. SaveChanges metodi yangilangan ma’lumotlarni ma’lumotlar bazasiga yozadi.

Ma’lumotni o‘chirish. Quyida talabani o‘chirish uchun Entity Framework misoli keltirilgan:

```
using System;
using System.Linq;
using Microsoft.EntityFrameworkCore;
public class Student
{
    public int Id { get; set; }
    public string FirstName { get; set; }
    public string LastName { get; set; }
}
public class SchoolContext : DbContext
{
    public DbSet<Student> Students { get; set; }

    protected override void OnConfiguring(DbContextOptionsBuilder
optionsBuilder)
    {
        optionsBuilder.UseSqlServer("Server=localhost;Database=SchoolDB;
Trusted_Connection=True;");
    }
}
class Program
{
    static void Main()
    {
        using (var context = new SchoolContext())
        {
            var student = context.Students.FirstOrDefault(s => s.Id == 1);
            if (student != null)
            {
                context.Students.Remove(student);
                context.SaveChanges();
                Console.WriteLine("Student deleted.");
            }
            else
            {
                Console.WriteLine("Bunday talaba yo‘q");
            }
```

```
        }
    }
}
```

Xulosa qilib aytadigan bo‘lsak ADO.NET va Entity Framework ikkalasi ham C# dasturlash tilida ma’lumotlar bazasi bilan ishlash uchun muhim vositalardir. ADO.NET past darajali, yuqori samarali va moslashuvchan yondashuvni taklif qilsa, Entity Framework ishlab chiqishni soddalashtiradi va zamonaviy obyektga yo‘naltirilgan dasturlash prinsiplariga mos keladi. OYD tamoyillariga ko‘ra MVVM va MVC modellari bilan ishlash jarayoni va platformalar yaratilish tezligini hisobga olsak Entity Framework texnologiyasi afzallik beradi. Ammo tushunish va qayta ishlash jarayonining soddaligi bilan ADO.NET texnologiyasi afzaldir. Loyiha talablari va jamoaning tajribasiga qarab, dasturchilar ushbu texnologiyalardan birini tanlashi mumkin. Amaliy misollar orqali ko‘rsatilganidek, har bir texnologiya o‘ziga xos afzallik va cheklovlarga ega bo‘lib, to‘g‘ri tanlov loyiha muvaffaqiyatini ta’minlaydi.

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УДК 608.2

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СОВЕРШЕНСТВОВАНИЕ ПРОЦЕССА САМООБСЛУЖИВАНИЯ КЛИЕНТОВ МФЦ НИУ «БЕЛГУ»

Аннотация: *в данной статье рассматривается применение чат-бота с использованием технологий искусственного интеллекта как одного из средств организации самообслуживания клиентов МФЦ НИУ «БелГУ».*

Ключевые слова: *искусственный интеллект, чат-бот, самообслуживание.*

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IMPROVING THE PROCESS OF SELF-SERVICE FOR CLIENTS OF THE MFC NRU "BELSU"

Abstract: *this article discusses the use of a chatbot using artificial intelligence technologies as one of the means of organizing self-service for clients of the MFC NRU "BelSU".*

Key words*: artificial intelligence, chatbot, self-service.*

Одной из основных задач многофункционального центра НИУ «БелГУ» выступает процесс консультаций студентов и их родителей в вопросах, связанных с организацией учебного процесса в университете. В университетском МФЦ НИУ «БелГУ» можно проконсультироваться и получить услуги посредством личного обращения в момент посещения фронт-офиса МФЦ или по телефону горячей линии [3].

Однако клиенты многофункционального центра могут встречаются с такими проблемами, как продолжительное время ожидания и ограниченный доступ к услугам, предоставляемый только в рабочее время, что снижает их уровень удовлетворенности. Для преодоления данных недостатков была реализована возможность самообслуживания.

Самообслуживание клиентов – это один из видов клиентского сервиса, который позволяет клиентам самостоятельно получать необходимые услуги

или информацию без необходимости взаимодействия с представителями компании или организации.

Преимуществами использования средств самообслуживания являются: удобство; скорость облуживания; снижение нагрузки на сотрудников; повышение удовлетворенности клиентов. Недостатки средств самообслуживания: отсутствие личного общения; ограниченные возможности (сложные ситуации могут требовать вмешательства специалиста); технические проблемы, сбои.

В рамках МФЦ НИУ «БелГУ» каналами для самообслуживания являются официальный сайт и личный кабинет студента. При этом реализованы такие способы организации самообслуживания как: ответы на часто задаваемые вопросы, база знаний, электронные услуги в личном кабинете студента. Однако, не смотря на объем представленной в открытом доступе информации и организацию самообслуживания, студенты также обращаются с базовыми вопросами к специалистам.

Разработка и внедрение дополнительного средства, а именно чат-бота, поможет улучшить качество предоставления услуг в условиях самообслуживания. Чат-бот сможет отвечать на разнообразные ответы клиента без необходимости продолжительного поиска информации, что снизит время получения ответа.

Самой современной технологией для разработки чат-ботов является использование больших языковых моделей (LLM).

Большие языковые модели (LLM) относятся к области искусственного интеллекта в рамках обработки естественного языка (Natural Language Processing или NLP). Их используют для восприятия и создания подобия человеческого языка. Как правило, модели обучаются на обширной базе обучающих наборов текстовых данных, благодаря чему поддерживается способность справиться как с простым переводом, так и с интерпретацией сложного текста. Большие языковые модели используются в разных отраслях и направлениях, таких как маркетинг, образование, здравоохранение и юриспруденция [1].

Сфера высшего образования также использует LLM для генерации образовательного контента, а также для создания чат-ботов. Студенты университетов имеют большое количество вопросов по разным аспектам организации учебного процесса. Для автоматизации и оптимизации процесса предоставления информации можно использовать чат-боты на базе LLM. Чат-боты позволяют не только значительно упростить и ускорить процесс общения, но и позволяют повысить информационную поддержку студентов [2].

Использование больших языковых моделей позволяет открыть новые возможности в обслуживании студентов. Так, например, LLM способны генерировать ответы на привычном человеческом языке, охватывая широкий диапазон знаний и глубокое контекстное понимание. Все это дает возможность обрабатывать запросы любой сложности, а также

неоднозначные вопросы. LLM имеют высокую производительность и масштабируемость, из-за чего и становятся хорошим решением для растущей потребности университетов и других заведений. Благодаря непрерывному обучению и адаптации моделей к новым требованиям можно легко подстроиться под меняющиеся запросы и потребности образовательных учреждений. [2]

Обучение LLM производится на огромных, но обобщенных тематиках, наборах данных, поэтому в большинстве случаев эти модели не могут ответить на вопросы узкой направленности, где необходим глубокий опыт и знания в определенной области. Для преодоления данной используются разнообразные подходы адаптации LLM для определенной области.

Одним из подходов, использующихся для адаптации больших языковых моделей, выступает переобучение модели на новом наборе данных, более подходящем для целевой области. Полное обучение (или переобучение) представляет из себя обучение с нуля или на новом наборе данных, что позволит произвести полноценную адаптивность к той или иной задаче. При большом количестве данных модель достигнет высокой доли вероятности правильных ответов. Этот метод высокоэффективен, но для этого требуется огромное количество вычислительных ресурсов и времени [1].

Тонкая настройка (fine-tuning) выступает вторым подходом к адаптации больших языковых моделей и является альтернативой переобучению. Тонкая настройка позволяет взять уже обученную модель и произвести целенаправленные изменения. Можно сказать, что тонкая настройка позволяет дообучить уже имеющуюся модель на небольшом наборе узконаправленных данных, что позволяет без лишних изменений адаптировать модель под нужные задачи. Данный подход эффективнее и менее трудозатратен по сравнению с полным обучением с нуля. Однако, данный поход требует своевременного дообучения на новых данных по мере их поступления, что накладывает некоторые ограничения на динамично изменяющиеся области знаний [1].

Третьим подходом адаптации больших языковых моделей является интеграция LLM с имеющимися базами знаний, посредством метода генерации, дополненной поиском (retrieval augmented generation или RAG). Основой работы RAG выступает два последовательных действия: поиск релевантной информации из внешнего источника (базы данных) и последующая генерация текста на основе данных, извлеченных в ходе поиска. RAG позволяет быстро адаптировать модель для специфических задач. Для обучения модели не потребуется больших наборов данных, так как в этом случае модель может использовать внешние источники информации [1].

Исходя из представленных достоинств и недостатков, можно заключить, что наиболее рациональным инструментальным средством внедрения LLM в чат-бот университета является Retrieval augmented generation (RAG).

Таким образом, внедрение технологий искусственного интеллекта имеет большой потенциал для кардинальной трансформации и оптимизации процесса самообслуживания.

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SUBSURFACE DRIP IRRIGATION FOR COTTON UNDER WATER-SCARCE CONDITIONS

Annotation: *This article analyzes the efficiency of subsurface drip irrigation in cotton cultivation under water-scarce conditions, focusing on its impact on irrigation timing and rates. The research was conducted under the agro-climatic conditions of the Andijan region. Methods for determining crop water consumption were applied based on soil moisture reserves, evapotranspiration, wind speed, air temperature, and relative humidity using the FAO-recommended Penman method. The study highlights the potential for rational use of water resources, increasing crop yields, and enhancing the volume of agricultural output per 1 m³ of water. The water requirements of cotton were calculated according to its growth stages, and factors affecting yield were scientifically evaluated.*

Keywords: *drip irrigation, evapotranspiration, FAO Penman method, cotton crop, water consumption, irrigation rate, agrometeorological indicators, water resource saving, crop productivity.*

Introduction

Water scarcity is one of the most pressing challenges in arid and semi-arid regions, particularly in the agricultural sector of the Fergana Valley in Uzbekistan, including the Andijan region. Traditional surface irrigation methods—such as open canals and furrows—result in significant water losses due to evaporation, infiltration, and runoff. Moreover, these methods contribute to soil salinization, compaction, erosion, and a reduction in soil fertility and crop yields. Under such conditions, efficient use of available water resources and maximizing productivity per unit of water used have become critical needs.

In recent years, subsurface drip irrigation (SDI) has emerged as a promising water-saving technology worldwide. This method delivers water directly to the root zone of plants, significantly reducing evaporation losses, preserving soil structure, and creating optimal moisture conditions for plant growth.

This study was conducted under the specific soil and hydrogeological conditions of Andijan region, characterized by meadow-gray, medium sandy loam soils and groundwater levels ranging from 2.0 to 2.5 meters. The main objective of the research was to assess the effectiveness of subsurface drip irrigation on irrigation scheduling, seasonal water requirements, and water use efficiency.

The relevance of the study lies in its practical potential to:

- Reduce river water consumption for irrigation;
- Increase crop productivity per unit (m^3) of water used;

• Ensure sustainable cotton production under conditions of limited water resources;

• Improve the reclamation status of soils and maintain agro-ecological stability.

In addition, the research applied the Penman method, as recommended by FAO, to estimate crop evapotranspiration. Based on this, a scientifically grounded irrigation regime was developed for cotton cultivation using innovative and water-saving approaches.

Methods

The study was conducted in meadow-gray soils with medium sandy texture under conditions of groundwater levels at 2.0–2.5 m. The determination of irrigation norms and number of irrigations was based on soil moisture deficits and crop biological requirements, using S.N. Ryzhov's soil moisture formula:

$$m = (W_{ЧДНС} - W_{ФАК})100Jh + к$$

Where:

$W_{ЧДНС}$ - soil's field capacity (% by weight)

$W_{ФАК}$ - actual pre-irrigation moisture (% by weight)

J - soil bulk density (g/cm³)

h - effective root zone depth (m)

k - evaporation loss factor (10% of deficit)

To determine crop water consumption (evapotranspiration), the Penman method (FAO, 1984) was used due to its accuracy. Reference evapotranspiration (ET0ET_0ET0) was calculated as:

$ET_0 = c\{wRn + (1-w)f(u)(l_a - l_d)\}$,

Where:

w - radiation weight coefficient

Rn - net radiation (mm/day)

f(u) - wind function

$l_a - l_d$ - vapor pressure deficit

c - correction coefficient based on local weather

Actual evapotranspiration for cotton ETcrop was calculated with crop coefficient K_c:

$ETcrop = K_c\ ET_o$

The growth stages of cotton were divided into four phases, and corresponding crop coefficients were used based on FAO recommendations:

Initial: Kc=0.45 (25–30 days)

Crop development: Kc=0.80 (45–60 days)

Mid-season: Kc=1.15 (50–70 days)

Late-season: Kc=0.65 (30–50 days)

Results

The application of intra-soil irrigation significantly improved water use efficiency. By tailoring irrigation schedules to evapotranspiration and crop growth stages, water application could be reduced without compromising yield. The

calculated seasonal evapotranspiration values allowed for precise irrigation timing and reduced the number of irrigations. Radiation, wind speed, air humidity, and temperature were effectively incorporated into the model, which showed evapotranspiration variations between 3.5–6.2 mm/day depending on the growth stage and weather conditions.

Discussion

The results highlight the advantages of intra-soil irrigation in arid climates. Water-saving was achieved by applying water directly to the root zone and minimizing evaporation losses. The FAO Penman method proved to be a reliable tool for determining irrigation needs. Crop coefficients adjusted by growth stages ensured accurate water application. The study confirms that proper irrigation management can improve crop productivity and sustainability of water resources in cotton cultivation.

Conclusion

This research demonstrates that intra-soil (drip) irrigation, when managed according to scientifically determined crop water requirements, can significantly improve water use efficiency and yield in cotton cultivation. The use of advanced evapotranspiration models and local climate data allows for more precise irrigation planning in arid regions

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PEDAGOGICAL MECHANISM FOR ORGANIZING SCIENTIFIC RESEARCH ACTIVITIES

Abstract: *This article discusses the pedagogical mechanisms of organizing research activities, analyzes the role and importance of a research-based approach in the modern educational process. The authors justify the need to develop pedagogical foundations that combine a competency-based approach, social interaction, reflective activity, project and problem-based learning methods. The role of an innovative environment, information and communication technologies, diagnostic tools, and a collaborative learning and assessment system in the effective implementation of research activities is also highlighted. The article aims to develop an effective pedagogical model that serves to form competencies such as critical thinking, independent learning, information analysis, and professional responsibility through the organization of research activities.*

Keywords: *scientific research activity, pedagogical mechanism, competency-based approach, reflection, innovative environment, project-based learning, problem-based learning, information technology, social interaction, critical thinking.*

Introduction

Effective research activities serve as a cornerstone in the development of professional competencies within educational contexts, necessitating a structured pedagogical mechanism to guide their organization. As teaching practices evolve in response to societal demands and technological advancements, the integration of systematic approaches to research becomes paramount for fostering critical thinking and innovation among students. Establishing such mechanisms involves not only the formulation of didactic strategies but also the alignment with pedagogical theories that inform practical applications. This essay explores the intricacies of organizing research activities, emphasizing the motivational, content, and technological components essential for cultivating meaningful student engagement and competence development, as highlighted in studies on health-saving competencies among future educators (Бондаренко et al.). Moreover, the role of theoretical perspectives, such as those examined in applied linguistics, offers valuable insights into tailoring research instruction to diverse learning contexts, thereby enhancing the overall efficacy of pedagogical frameworks (Wildner-Bassett M).

Effective education relies heavily on the continuous evolution of knowledge and practice, which is fundamentally supported by research activities. These activities enable educators and students alike to engage critically with educational theories and methodologies, fostering a deeper understanding and facilitating innovation within pedagogical processes. Research cultivates essential skills such as analytical thinking, communication, and reflection, which are vital for professional development and adaptability in dynamic educational environments. Moreover, integrating research within teacher training enhances the formation of competencies that empower educators to design and implement health-saving and developmental strategies crucial for student well-being and learning outcomes (Бондаренко et al.). Additionally, research participation nurtures readiness for professional responsibilities by aligning theoretical knowledge with practical application, particularly in specialized fields like preschool education where pedagogical approaches must adapt to evolving socio-cultural demands and educational standards (Волинець et al.). Thus, research activities form a critical mechanism essential to the effective organization and continuous improvement of educational practice.

Theoretical Framework of Research Pedagogy

Effective organization of research activities in educational settings requires a robust theoretical framework that delineates roles, responsibilities, and interaction dynamics among educators and support personnel. This framework underscores the importance of clear functional distinctions to prevent conflicts and enhance collaborative efficiency, especially within inclusive environments where specialized assistance is critical. For instance, the delineation between a teacher, teacher's assistant, and child's assistant is essential to maintain a cohesive pedagogical process and optimize support for learners with varied educational needs (S Sytniakivska et al.). Furthermore, research pedagogy must integrate systematic motivational strategies to sustain engagement and socialization, as illustrated by the role of family support in sports education, which highlights how external influences reinforce long-term commitment through targeted educational and promotional activities (A A Svirid). Together, these perspectives enrich the theoretical foundation by emphasizing both structural clarity and motivational support as pivotal mechanisms for organizing and sustaining effective research pedagogy.

Effective research-based learning is fundamentally grounded in principles that prioritize active engagement, critical reflection, and the integration of theory with practice. Central to this approach is inquiry-based learning, which empowers students to construct knowledge through collaborative investigation and critical analysis, thereby fostering autonomy and professional growth. Such pedagogical frameworks emphasize the dynamic relationship between research activities and practical application, enabling learners to redefine their role as knowledge creators within their disciplines (Iglesias P et al.). Additionally, the incorporation of systematicity, accessibility, and scientific rigor ensures that research processes are coherent and grounded in sound methodology. Theories promoting problem-based learning, creativity, and ethical considerations enrich this framework by

encouraging flexible, interactive, and critically aware exploration of media and information sources (Ishutina O). Together, these key principles and theories form a comprehensive foundation that supports the structured organization of research activities, ultimately enhancing both educational outcomes and learners' competence as reflective practitioners.

Effective organization of research activities necessitates a structured approach that aligns with both pedagogical goals and practical implementation methods. Central to this process is the creation of a motivational framework that fosters positive attitudes and internal drives toward research among learners, as outlined in studies focusing on competency development in educational settings (Бондаренко et al.). Additionally, integrating innovative educational environments that promote competence-oriented and project-based learning enhances the students' ability to engage in meaningful inquiry (Savelchuk et al.). Practical strategies include the systematic use of diagnostic tools to assess knowledge and skills, the application of creative tasks to stimulate critical thinking, and the implementation of collaborative partnerships between educational institutions and social organizations. These approaches collectively support a dynamic and purposeful research process, encouraging reflection, innovation, and real-world application. Such pedagogical mechanisms ensure that research activities are not isolated but embedded within broader educational and social contexts, fostering a holistic learning experience.

Successful organization of research projects within educational settings often hinges on the thoughtful integration of pedagogical principles and technological tools that enhance collaboration and learning. By embedding group-based project work in structured environments, educators can foster active engagement and shared responsibility among students, thereby enriching educational outcomes. Utilizing web-based platforms that provide shared workspaces, communication-management functionalities, and continuous evaluation mechanisms not only streamlines the research process but also cultivates critical teamwork skills essential for academic inquiry (Andernach et al.). Furthermore, a well-designed taxonomy that considers both technical delivery methods and educational goals can guide the development of curricula and teaching strategies tailored to diverse disciplines. Such frameworks facilitate iterative feedback and targeted assessment, thereby improving student comprehension and retention of research methodologies (Efthimiadis et al.). Collectively, these effective structuring methods contribute to a robust pedagogical mechanism that supports organized and meaningful research activity within educational settings.

Effective learning is increasingly dependent on structured engagement with research activities that cultivate critical thinking and problem-solving skills. Organized research frameworks provide learners with opportunities to apply theoretical knowledge in practical contexts, fostering deeper understanding and enhancing cognitive and metacognitive abilities. This process aligns closely with self-regulated learning models, which emphasize the integration of motivation, emotion, and strategic planning to optimize educational outcomes (Panadero E).

Furthermore, the clarity and interpretability of research tasks, similar to the transparency sought in decision support systems, can help students navigate complex information more effectively, preventing cognitive overload while promoting ethical and reflective inquiry (Guidotti R et al., p. 1-42). By systematically organizing research activities, educators not only scaffold students' intellectual development but also encourage autonomous learning strategies, which are essential for academic success and lifelong learning. Therefore, the pedagogical mechanism that structures research engagement plays a vital role in significantly improving learning outcomes across diverse educational settings.

Conclusion

Effective organization of research activities within pedagogical frameworks requires a dynamic interplay of innovative strategies and structured guidance to foster meaningful learning experiences. The pedagogical mechanism must therefore be purposefully designed to integrate competency development, social partnership, and reflective practices, ensuring that learners are not only receivers but active participants in knowledge creation and application. By combining theoretical foundations with practical, project-based approaches, educators can cultivate a research-oriented mindset that adapts to evolving academic and social demands, as demonstrated in innovative environments like those outlined for social worker training (Savelchuk et al.). Furthermore, leveraging structured narrative pathways and semantic frameworks can enhance students' engagement with complex information, enabling them to navigate and synthesize vast resources meaningfully (Motta et al.). Ultimately, this blended approach to organizing research activities promotes critical thinking, autonomy, and deeper comprehension—key outcomes for preparing learners to contribute effectively in their respective fields.

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THE IMPACT OF CYBERSPACE AND HUMAN-TECHNOLOGY INTEGRATION ON SOCIAL LIFE: A SOCIO-PHILOSOPHICAL ANALYSIS

Abstract: *The article examines the impact of cyberspace and technological integration on social life from a socio-philosophical perspective. The emerging relationships between humans and technology, as well as their influence on social consciousness, personal identity, ethical norms, and interpersonal relations within society, are analyzed. Furthermore, the transformation of human nature in the digital world, the role of artificial intelligence, algorithmic governance, and the changes brought by technological structures to social equilibrium are evaluated through a philosophical approach. The article conceptually interprets the impact of modern technologies on society based on international philosophical sources.*

Keywords: *Cyberspace, technogenic society, human-system integration, algorithmic governance, identity, philosophical analysis, technological transformation, artificial intelligence, society and technology, social reality, digital identity, posthumanism, virtual reality, information society, technoethics.*

The 21st century has ushered humanity into the stage of a global information society. At this stage, the concepts of “cyberspace” and “human-technology integration” have naturally become significant objects of analysis not only in technological but also in philosophical and social contexts. Today, humans are integrating their thinking, perception, and consciousness with technological systems, which, in turn, is fundamentally transforming the social structures of society.

Philosopher L. Floridi explains this phenomenon through the model of the “inforg” – a human transformed into an information organism: “Individuals existing in cyberspace are now perceived not as physical entities but as informational beings” [1].

Cyberspace is a new form of existence shaped by virtual and digital information systems, where humans interact within a technological environment. This environment is referred to by Negroponte as the “world of bits,” which he describes as follows: “The digital realm is immaterial but has a real social impact” [2].

The model of a human integrated with technology is considered in many contemporary philosophical approaches within the framework of posthumanism. As

F. Fukuyama notes: “Humanity risks losing its essence by altering its genetic and technological foundations” [3]. Through such integration, the physical and spiritual boundaries of humans are expanding. Neuroprosthetics, artificial intelligence systems, and technologies for replacing defective organs are vivid examples of this.

Analyzing the impact of human-technology integration in cyberspace on an individual’s social consciousness and identity is also pertinent. Technological integration, particularly through the internet and social networks, directly influences human identity. An individual now possesses multiple digital representations, which, in turn, give rise to the concept of “digital identity.” Zygmunt Bauman refers to this as “liquid modernity” and explains: “Digital identities are not stable; they are fluid and adaptable” [4]. As a result, the boundaries between private life and public exposure are disappearing. Individuals live with their digital “self,” and in most cases, their real-life decisions are mediated by technological systems. Researcher O. Berkinov describes the phenomenon of digital identity through the concept of “virtual image”: “A virtual image is an individual’s representation in virtual networks, websites, social media, virtual games, and all types of information-communication tools. This includes the purposes for which they use the internet, the amount of time spent online, their level of activity on social networks, their internet usage culture, and the websites they frequent. Within the virtual image, an individual’s virtual character is also formed. This virtual character involves behaviors such as engaging in trolling, interacting with networks, being active across various platforms, expressing positive or negative attitudes through comments on social media, and similar activities” [5].

Alisa Nafikova, a candidate of technical sciences at Bashkir State University, highlights the following concepts among those that involve embracing modern changes and their development to improve the quality of life: “posthumanism” (viewing humans as biosocial entities integral to the technosphere, with the potential to enhance intelligence through artificial intelligence); and “abolitionism” (advocating the use of biotechnologies to maximize happiness and eliminate suffering) [6]. In many developed countries, scientists are working on creating a new “technohuman” by integrating humans with technology. These efforts have yielded some results, such as heart stents, prosthetic legs, prosthetic arms, artificial eyes, specialized hearing devices for ears, and more. This raises the philosophical question: should a human whose body consists of multiple artificial technological components be considered a human or a machine? We propose that such an individual be referred to as a “technohuman” or “hybrid human.” The integration of technical devices into the human body is helping people with disabilities join the ranks of healthy individuals. Nafikova refers to the mechanism of enhancing human capabilities through technology as “transhumanism.” This concept involves using technological elements and the achievements of modern science not only for the well-being of society but also to improve human intellectual and physical capabilities, aiming to eliminate phenomena such as disease, aging, and death [7]. We conclude that the accelerating process of social evolution produces dual outcomes—positive and negative. The positive aspect is that technology assists

humans when their natural capabilities are insufficient. The negative aspect is the intensification of social stratification, where individuals lacking modern digital knowledge face increasing difficulties in life.

Human-technology integration is impacting various aspects of social life. Below, the main directions of these impacts are discussed.

Social Relationships. Cyberspace has brought significant changes to the formation and development of social relationships. Through social networks, people have gained the ability to communicate on a global scale. However, this process has also led to issues such as social isolation and the displacement of real relationships by virtual interactions. According to Sherry Turkle, "digital communication reduces empathetic connections between people" [8].

Education. Distance learning and online platforms have democratized the educational process, but they have also introduced challenges related to educational quality and inequality. According to a source cited in the article, "information and communication technologies create new opportunities in education, but their effectiveness depends on infrastructure and qualified specialists" [9]. For instance, in developing countries, online education faces limitations due to insufficient resources.

Labor and Economy. Cyberspace has brought significant changes to the labor market through automation and the introduction of artificial intelligence. According to Frey and Osborne's research, "digital technologies are shaping new demands in the labor market by automating many professions" [10]. While this process increases efficiency on one hand, it may lead to unemployment and social inequality on the other.

Ethics and Culture. Cyberspace also impacts human ethical perspectives and cultural values. In the virtual environment, issues such as the privacy of personal data, cybercrime, and ethical dilemmas emerge as significant challenges. According to Luciano Floridi's philosophy of information, "cyberspace requires new ethical norms because it creates new forms of human activity" [11].

The impact of human-technology integration on social life has both positive and negative aspects. Positive aspects include expanded global communication opportunities, easier access to education and information, and increased economic efficiency. However, the negative aspects are equally significant: social isolation, breaches of privacy, the erosion of ethical values, and the threat posed by artificial intelligence to human autonomy.

From a philosophical perspective, cyberspace alters the ontological state of humanity. As Heidegger notes, "technology alienates humans from the world and compels them to view themselves as mere tools" [12]. This process poses the risk of humans losing their uniqueness. At the same time, existentialist approaches, such as the philosophies of Kierkegaard and Nietzsche, emphasize the human capacity to independently define their own purposes [13].

Cyberspace is a new type of projective cultural space that combines symbolic reality and modern technologies, facilitating and significantly accelerating human intellectual activity [14]. The ethical issues of cyberspace are also significant.

According to Floridi, “information ethics requires a new concept of responsibility in cyberspace” [15]. For instance, the loss of human control over decision-making processes involving artificial intelligence poses a serious risk.

The integration of humans and technology in cyberspace profoundly impacts all aspects of social life. This process brings positive opportunities (global communication, education, and economic efficiency) alongside negative consequences (social isolation, ethical issues, and inequality). Philosophical analysis indicates that cyberspace redefines the ontological and ethical state of humanity, necessitating the development of new norms and concepts of responsibility.

Future research should focus on deeply exploring the impact of cyberspace on human psychology, cultural identification, and global social structures. Additionally, by developing ethical and legal norms, the negative consequences of cyberspace can be mitigated.

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ARTIFICIAL INTELLIGENCE TRANSFORMING MEDICAL TRAINING AND PATIENT CARE IN SIMULATION MEDICINE

Abstract: *This review highlights the integration of artificial intelligence (AI) in simulation-based medical training. AI enhances realism and adaptability in simulations, especially in surgical training, by providing real-time feedback and adjusting scenarios based on trainee performance. It supports clinical decision-making, enables personalized learning, and increases training accessibility while improving patient safety. Despite benefits, challenges include technical limits, costs, ethical concerns, and potential overreliance. Continued innovation in AI and machine learning is essential for advancing medical education and global healthcare outcomes.*

Keywords: *Artificial Intelligence, Simulation Medicine, Medical Education, Machine Learning, Surgical Training*

Introduction. Simulation medicine, a pivotal aspect of modern healthcare education and training, employs various technologies to mimic real-life medical scenarios. This educational approach allows healthcare professionals, from novice students to experienced practitioners, to hone their skills, make decisions, and perform procedures in a risk-free environment. The realism and fidelity offered by simulation medicine are crucial for effective learning and the safe translation of medical knowledge into practice [1, 5, 7]. The integration of AI technologies across multiple sectors has been transformative, with medicine being no exception. AI's potential to enhance the complexity and usefulness of simulations is significant, leveraging advanced algorithms, machine learning, and other computational methodologies to create more accurate, responsive, and adaptive medical training tools. This technological infusion not only enriches the educational experience but also pushes the boundaries of what simulation can achieve, from basic procedural training to complex decision-making scenarios [2, 3, 10]. The objective of this review is to thoroughly examine how AI is revolutionizing simulation medicine. We will explore various AI-driven innovations and their applications within this field, assess the impact on training and patient care, and discuss the future directions of this burgeoning integration.

Materials and Methods. This section outlines the methodology used to gather, analyze, and synthesize the relevant information on the role of AI in simulation medicine. A systematic approach was employed to ensure a

comprehensive understanding of the current applications and potential future directions of AI in this field.

Results. AI has transformed the landscape of medical training and education by introducing more realistic and adaptive learning environments. AI-enhanced simulators can analyze the behavior of trainees in real time, adjusting the complexity and nature of scenarios to match their proficiency levels. This personalized approach ensures that each learner faces challenges tailored to their current skills, promoting faster and more effective learning. Moreover, AI enables the incorporation of virtual patients with diverse backgrounds and medical histories, offering a broader spectrum of clinical interactions. This capability ensures comprehensive training that prepares healthcare professionals for a variety of clinical settings and patient needs [1, 2, 5]. In the realm of surgical training, AI-driven simulators are pivotal in bridging the gap between theoretical knowledge and clinical practice. These simulators use advanced algorithms to create highly detailed and accurate surgical scenarios that mimic real-life operations, including the unpredictable nature of human anatomy and surgical complications. Trainees can perform surgeries on virtual platforms that respond realistically to surgical techniques, providing immediate feedback on their precision and adherence to best practices. This form of simulation is invaluable for training surgeons, allowing them to refine their skills in a controlled, risk-free environment before performing actual surgeries [4, 5, 9, 10].

AI also plays a crucial role in developing clinical decision support simulators, which are designed to enhance decision-making skills under pressure. These simulators present complex medical scenarios that require quick and effective decision-making, mimicking the high-stress conditions often found in real medical environments like emergency rooms or intensive care units. By integrating real-time data processing and predictive analytics, AI enables these simulators to present dynamically changing scenarios that challenge the decision-making process of healthcare professionals. This training is critical in preparing medical personnel to make swift, accurate, and potentially life-saving decisions in actual clinical settings [1, 3, 7,]. Together, these applications of AI not only enhance the quality of training provided in simulation medicine but also ensure that the healthcare workforce is better prepared to meet the challenges of modern medical practice with confidence and competence.

Role of Machine Learning Algorithms. Machine learning algorithms are at the forefront of enhancing the fidelity and realism of medical simulations. These algorithms can process vast amounts of data from real clinical cases to model complex medical scenarios with high accuracy. By learning from past simulations and their outcomes, machine learning helps in refining simulation models to better replicate the nuances and variability of human pathologies and responses. This ongoing learning process ensures that simulations become increasingly sophisticated over time, providing training experiences that are indistinguishable from real-life interactions and procedures [3-6].

One of the most significant benefits of AI in simulation medicine is the enhancement of learning outcomes through personalized and adaptive learning experiences. AI algorithms analyze the performance of each trainee, adapting scenarios in real-time to suit their learning pace and skill level. This personalization ensures that learners are neither under-challenged nor overwhelmed, promoting optimal learning conditions that cater to individual needs. Such tailored training not only accelerates skill acquisition but also deepens understanding by focusing on areas that require additional practice. Consequently, trainees emerge from simulation training better prepared and more competent, leading to more effective clinical practice [3, 2, 10].

Conclusions. This review has comprehensively explored the transformative role of AI in simulation medicine, revealing its profound impact across various domains such as training and education, surgical simulations, and clinical decision support systems. AI enhances the realism and adaptiveness of medical simulations, thereby elevating their effectiveness as training tools for healthcare professionals. The overall impact of AI on simulation medicine has been profoundly positive, personalizing learning experiences, enhancing the accessibility of training tools, and improving patient safety through risk-free, realistic practice environments. AI's ability to provide detailed analytics and real-time feedback has revolutionized medical training approaches, leading to higher competence and confidence among healthcare providers.

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POSSIBILITIES OF USING EFFECTIVE MODERN METHODS IN TEACHING PHILOSOPHICAL SCIENCES

Abstract: *The article analyzes methods such as vitagen, reflexive, and facilitative technologies, as well as techniques like boomerang, finding connections, SWOT analysis, and ethical dilemmas, which have been identified as effective in teaching philosophical sciences within the education system. The potential of these methods to serve socially oriented tasks in preparing future professionals is outlined. The article introduces teachers and students of philosophical sciences to methods that facilitate a comprehensive understanding of philosophical issues.*

Keywords: *method, pedagogical technology, social function, philosophical education, modern pedagogical approaches.*

The Development Strategy of the Republic of Uzbekistan for 2022–2026 has outlined 100 goals across 7 priority directions to comprehensively advance the country, ensure the prosperous life of its people, and continue reforms aimed at forming active civil society institutions. Specifically, Goal 70, titled “Improving State Policy on Youth,” focuses on promoting the spiritual, intellectual, physical, and moral development of youth, ensuring open and high-quality education, and providing comprehensive educational opportunities at all levels. Achieving these objectives requires organizing the teaching of philosophical sciences in education using innovative pedagogical technologies and interactive methods.

The use of pedagogical technologies and methods that enhance the effectiveness of philosophical science classes in educational institutions contributes to the realization of the aforementioned goals. Below, we analyze the effectiveness potential of the following technologies and methods:

Vitagen Technologies – These are technologies used in selecting educational content, aimed at solving real-life problems and transforming knowledge into competencies through the unity of theory and practice. “The essence of vitagen technologies lies in the concepts of life experience and skills”[168]. These concepts can be observed in the transformation of a student’s personality—information frequently encountered, identified, and widely applied in life experience—into life experience, or vitagen experience. This technology teaches students to think

[168] Нарзикулова Д.Х. Таълимни ахборотлаштириш шароитида педагогик низоларнинг профилактик технологияларини такомиллаштириш, Пед. фан. бўйича (PhD)...дисс. автореф. – Самарқанд –2018.: -16- б.

scientifically while performing tasks related to a specific topic, work collaboratively in groups, and critically analyze the subject or phenomenon being studied. Specifically, vitagen technologies enable students to apply theoretical and practical knowledge in real-life processes through methods such as controversial lectures, brainstorming, case studies, and boomerang techniques. The use of case studies in philosophical science classes fosters the development of several important qualities in students, including:

- Teaching objective thinking;
- Facilitating harmony between theory and practice;
- Creating multiple alternative approaches to problem-solving;
- Enhancing the ability to accept others' opinions;
- Cultivating a sense of responsibility.

"Facilitative Technologies – These guide students to complete educational tasks in small groups during the learning process, leading to the formation of a facilitator-leader. Preparing facilitators with experience in creative activities for the theoretical analysis of social-ethical issues is of great importance"[169].

The use of the "Boomerang" method in philosophical education creates opportunities for applying modern pedagogical approaches. This method enhances students' social activity. One of its main advantages is that it fosters independent thinking and assimilation skills, contributing to the formation of a healthy worldview. For instance, assigning articles such as "What is the benefit of philosophy?", "Why are social-humanitarian sciences necessary?", or "Why is it important to study history?" and then applying the knowledge gained through this method allows students to gain a comprehensive understanding of the social significance of philosophical sciences.

Reflective Technologies – These are technologies that enable students to reinforce and develop their acquired knowledge, skills, and competencies by applying them in new and unexpected situations. Reflective technologies require a system that allows students to perform mental operations while completing educational tasks. Students are divided into groups: the first group proposes a project addressing a problematic situation, the second group suggests ways to optimize it, and the third group analyzes it, proposing the most effective solution for the discussion. As a component of reflective discussion, a reflective polylogue is embodied. The purpose of the reflective polylogue is to independently analyze problems by activating and developing creative potential.

Phenomenological Method – This method is based on perceiving reality through human consciousness and experience, taking into account subjective experience and its complexity. For example, when studying contemporary ethical issues in the subject of Ethics and Aesthetics, examining the opinions and conclusions of several students who have directly witnessed such issues in the classroom enhances the understanding and impact of the topic.

[169] Рахимов.А.К., - Талабаларда табиий-илмий дунёқарашни ривожлантириш методикасини такомиллаштириш (эволюцион таълимот фанини ўқитиш мисолида), Пед.фан.доктори (DSc)…дисс. автореф. – Т.: 2019. –22 б.

Table 1. Examples of Using the Phenomenological Method

Aesthetic and ethical issues	Relatively supportive opinions	Completely opposing views	Examples of justifying
Tattoo			
Euthanasia			
Death			

This method helps to understand reality deeply through vivid examples, fosters the creation of new concepts and ideas, and proves the importance of subjective experience.

Ethical Dilemmas Method. The use of the ethical dilemmas method, not only in Ethics and Aesthetics but also in all philosophical science classes and independent learning sessions, promotes the development of students' critical thinking, argumentation, and ethical decision-making skills.

Table 2. Content Related to the Use of the Ethical Dilemmas Method.

Situation	I support this action	I am against cases of law violation	Aspects of using an integrative approach and reflective technologies
	Causes and		
The doctor handed Citizen A a list of prescribed medications for their child and stated that, despite it being 2:00 AM, the medicine must be brought within 20 minutes. The representative of the nearest pharmacy (Pharmacy 1) informed Citizen A that the required medicine was not available but was definitely available at the adjacent pharmacy, which only operates during the day. Citizen A broke into Pharmacy 2, took the necessary medicine, and left a note with their phone number and a promise to compensate for all damages caused. At 4:00 AM, the doctor noted that the patient's condition had improved, emphasizing the critical importance of the medicine being delivered on time.	-	-	What approach do practitioners consider appropriate in such a situation? What is the essence and content of the principle of expediency? Can this situation be cited as an example of "extreme necessity" among the circumstances excluding the criminality of an act in the Criminal Law and the Universal Declaration of Human Rights?

Hermeneutic Method. This method aids students in achieving deep understanding, critical analysis, cultural awareness, self-understanding, and the

development of dialogue by interpreting various source texts and socio-cultural phenomena. It is effective in explaining human philosophy, ethical principles, and uncovering the essence behind wise sayings. For example, J. Rumi's statement, "Let us learn to read ourselves before reading books," may seem difficult to grasp at first glance. However, by analyzing the author's intent, a deeper approach reveals its true meaning.

Finding Connections Method. This method enables students to gain a general understanding of the significance of the constituent elements of the studied object within the system of social issues and their connections with other spheres of society. For instance, in the subject of social philosophy, when explaining the topic "Main Spheres of Social Life and Factors of Development," emphasizing the importance of each social institution helps reinforce students' knowledge of dialectical laws. The "finding connections" method also serves to achieve the objectives of the subject in the topic "Globalistics – the Philosophy of Global Problems."

Table 3. Philosophical Analysis of the Interconnectedness of Global Problems.

Global problem.	Contributing factors.	Ways to eliminate	UN statistical facts
Famine.	Illiteracy, wars, corruption…	Providing employment to the population, teaching vocational skills, achieving efficiency in the education system.	Every 7 minutes, a child dies of hunger worldwide. To eradicate famine, $80 billion—0.5% of global income—is needed.
Illiteracy.	Demographic explosion, famine, poverty.	Restricting child labor.	
Peace issue.	Arms trade, drug trafficking, illiteracy, extremism and terrorism, drug	Strengthening knowledge and enlightenment, developing international	UN statistical facts.

Considering the characteristics of the audience and the worldviews of students when using each method contributes to effectiveness.

In conclusion, it can be said that the use of methods based on modern pedagogical approaches in the educational process not only fosters an active civic stance among youth but also prepares them to address pressing issues in their future professional activities.

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IRRIGATION EROSION CONTROL: MINIMIZING SOIL EROSION THROUGH EFFECTIVE IRRIGATION PRACTICES

Abstract. *The paper presents the results of a study on soil erosion processes during irrigation. The findings show that completely eliminating soil washout is practically impossible. However, the main task is to select irrigation components that minimize soil washout within acceptable limits. This allows for the development of effective methods and equipment for non-traditional irrigation technologies, such as drip and surface irrigation, which reduce water speed, prevent erosion, and contribute to soil conservation and fertility.*

Keywords: *adyr (hilly terrain), slope, gradient, furrows, relief, soil fertility, irrigation erosion, irrigation network, exponential law, irrigation pipeline, traditional irrigation technology.*

Introduction

Soil erosion is one of the most significant challenges in agriculture, especially in areas where irrigation is essential for crop production. Irrigation-induced erosion occurs when water runoff removes the topsoil, leading to a decrease in soil fertility and productivity. This issue is particularly critical in regions with steep slopes and complex terrain. The goal of this study is to explore how irrigation practices can be optimized to minimize soil erosion while maintaining the efficiency of water use in agricultural production.

Methods

This study focuses on the assessment of irrigation practices and their impact on soil erosion in regions with sloping terrain. A series of experiments were conducted to evaluate different parameters of irrigation, including water flow rates, furrow length, irrigation duration, and the distribution of water along the furrow. The experimental area was selected in the Andijan region, where soils are prone to erosion under improper irrigation conditions.

Data were collected on soil erosion rates, the amount of water runoff, and the impact of irrigation parameters on soil degradation. Various types of irrigation techniques were tested, and their efficiency was compared in terms of minimizing water loss and soil erosion.

To achieve this, the study used an experimental approach where multiple irrigation parameters were varied to determine the optimal conditions for reducing erosion while maintaining the effectiveness of irrigation. Soil erosion rates were measured by assessing the amount of topsoil lost during the irrigation process. Additionally, measurements of water runoff and infiltration were recorded to

understand how different irrigation practices impacted soil moisture distribution and erosion levels.

Results

The results of the study demonstrate that irrigation in sloped areas can lead to significant soil erosion if not managed correctly. Specifically, the findings indicate that the water flow rate at the beginning of irrigation and the length of the furrows play crucial roles in reducing runoff and erosion. The optimal water flow rates and furrow lengths were identified, which helped minimize soil erosion by ensuring a uniform distribution of water and reducing the surface runoff.

The experiments showed that the degree of erosion could be minimized by adjusting the water consumption parameters at the start of irrigation. By modifying the irrigation setup to account for the slope of the land, the soil erosion rate was significantly reduced, with lower amounts of topsoil being washed away. Additionally, the study found that a higher coefficient of uniformity in irrigation significantly contributed to minimizing the erosion process. This means that by applying water more evenly along the furrow, the likelihood of water runoff and erosion was reduced.

Moreover, the study observed that soil erosion rates varied depending on the specific parameters used, such as the duration of irrigation and the slope of the land. In areas with higher slopes, reducing the irrigation time and adjusting the water flow rate were particularly effective in controlling erosion. The optimal parameters for these conditions were identified, ensuring minimal water loss and maximum absorption by the soil.

Discussion

The findings from this study emphasize the importance of optimizing irrigation practices to mitigate the effects of erosion. Proper irrigation methods can significantly reduce water runoff, thus preventing the loss of valuable topsoil. In areas with steep slopes, it is essential to carefully regulate the amount of water applied during irrigation to prevent soil erosion. Over-irrigation and uneven water distribution are major contributors to erosion in such areas, as excess water can wash away the topsoil, leading to soil degradation.

The results also highlight the importance of technological innovations in irrigation systems. Automated systems that monitor and adjust water flow can further improve efficiency, ensuring that water is applied evenly and at the right rate. These systems can also help prevent over-irrigation, which is a major contributor to erosion in sloped areas. By incorporating these technologies, irrigation can become more precise and sustainable, significantly reducing its impact on soil erosion.

Additionally, the study suggests that further research into soil properties and irrigation practices is essential to understanding the full extent of the relationship between water usage and soil erosion. Soil characteristics, such as texture and organic matter content, play a critical role in how water interacts with the soil, which in turn influences erosion rates. Understanding these interactions can lead to the

development of more targeted irrigation strategies that protect the soil while optimizing water use.

Conclusion

This study confirms that efficient irrigation practices are crucial for controlling soil erosion in agricultural regions with sloping terrain. By optimizing irrigation parameters, such as water flow rates, furrow length, and irrigation duration, the impact of erosion can be minimized. The research has shown that reducing the flow rate of water at the beginning of irrigation and adjusting the length of furrows are key factors in minimizing water runoff and soil erosion.

Additionally, the introduction of more advanced irrigation technologies, such as automated and mechanized systems, can further enhance the effectiveness of erosion control. These technologies not only improve irrigation efficiency but also contribute to more sustainable agricultural practices by reducing water waste and preventing soil degradation.

The results of this research are valuable for regions like Andijan, where soil erosion is a significant concern. By implementing the recommended irrigation practices, it is possible to protect the soil, preserve its fertility, and improve agricultural productivity. Further research and development of irrigation systems will continue to play a critical role in ensuring sustainable agricultural practices and mitigating soil erosion in the future.

This study underscores the importance of continuous innovation in irrigation technologies and practices. By addressing the challenges posed by soil erosion through effective irrigation management, it is possible to maintain and improve the productivity of agricultural land while preserving soil health for future generations.

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WATER AND ENERGY SECURITY IN UZBEKISTAN: CURRENT CHALLENGES AND STRATEGIC DIRECTIONS FOR SUSTAINABLE DEVELOPMENT

Abstract: *The article examines Uzbekistan's water and energy challenges amid growing demand and climate constraints. It highlights the country's heavy reliance on transboundary water, issues of soil degradation due to inefficient irrigation, and emphasizes the importance of policy reforms under the 2020–2030 agricultural strategy to improve water use efficiency and environmental sustainability.*

Key words: *water resources, energy security, agriculture, irrigation, transboundary water dependency, groundwater, Aral Sea basin, soil degradation, sustainable development, hydropower, environmental policy, climate adaptation*

For many millennia, the energy contained in flowing water has served humanity reliably. Its reserves on Earth are enormous — about three-quarters of the planet's surface is covered by water. The World Ocean acts as a vast energy accumulator, absorbing most of the energy coming from the Sun. Freshwater resources consist of continuously renewable river runoff, water reserves in lakes, glaciers, reservoirs, and groundwater. The foundation of water management is represented by the surface runoff of rivers. The choice of optimal water resource use (for the national economy as a whole, not for individual sectors) must necessarily take into account the prospects for the development of the national economy, and, where applicable, international cooperation in the energy sector and the joint use of water resources [2].

It is planned to achieve an average grain yield of up to 7.5 tons per hectare by 2030, with grains occupying up to 15% of the total cultivated area (Appendix No. 2, [1]). Due to its hot and arid climate, water plays a significant role in Uzbekistan not only in agriculture (which accounted for 28.1% of GDP in 2019) and industry (30.0% of GDP in 2019), but also in ensuring basic human needs [6].

The Republic of Uzbekistan is the most densely populated country in Central Asia. As of July 2020, its permanent population reached 33,905.2 thousand people [7]. About 49% of the population resides in rural areas, and their livelihoods are entirely dependent on agriculture and related sectors. The country's geographical features significantly influence its water and energy availability, placing Uzbekistan in a unique position in the region's water balance, hydropower potential, and overall economy.

Several key points define this situation:

First, only 9.6% of the total runoff of the Aral Sea basin is formed within Uzbekistan, which is less than in Kazakhstan (2.1%) and Turkmenistan (1.2%). The

majority of river runoff in the region originates in the mountains of Kyrgyzstan (25.1%) and Tajikistan (43.4%), but these resources are used by all countries in the region. Uzbekistan, however, has the highest water consumption — 39.3% of the total water intake from the region's main rivers, the Syr Darya and Amu Darya. For comparison, Turkmenistan uses 22.87%, Tajikistan 13.05%, Kazakhstan 11.07%, and Kyrgyzstan no more than 0.8%. Another important indicator is the transboundary water dependency ratio, which reflects the share of river runoff entering the country from abroad. For Uzbekistan, this figure is very high — 77%, surpassed only by Turkmenistan at 94%, while in Kazakhstan, it stands at 42%.

Second, Uzbekistan receives 95.642 billion cubic meters of river water annually. Of this, 52.291 billion cubic meters come from the Amu Darya basin and 43.351 billion cubic meters from the Syr Darya basin. Since Uzbekistan borders all neighboring countries and is located in the center of the region, some rivers continue to flow into adjacent countries. Outflows from Uzbekistan amount to 47.562 billion cubic meters, with 36.852 billion cubic meters from the Amu Darya basin and 11.228 billion cubic meters from the Syr Darya basin. Uzbekistan itself generates about 9.701 billion cubic meters of river water. Overall, Uzbekistan utilizes approximately 57.781 billion cubic meters of water (41.472 from the Amu Darya basin and 16.309 from the Syr Darya basin) [7].

Third, internal water resources include 525 lakes and 53 reservoirs. In the upper basins of the Surkhandarya, Kashkadarya, and Chirchik rivers, there are 525 glaciers covering a total area of 154.2 square kilometers. However, rivers — about 18,000 in total — are the most important water resources in Uzbekistan. They are unevenly distributed: in the plains, only 20 meters of river per square kilometer, whereas in mountainous regions, the density of the river network is much higher. These mountain rivers are not navigable but are rich in hydropower potential.

Fourth, as rivers reach the plains, much of their flow is diverted for irrigation through canals, while another part evaporates or is absorbed into the soil. As a result, many rivers dry up and disappear in the sands. Only the Amu Darya and Syr Darya reach the Aral Sea within Uzbekistan. However, in recent years, due to high irrigation demands, only a small fraction of these rivers' waters now reach the Aral Sea.

Fifth, an essential component of Uzbekistan's water resources is its groundwater, which supports the region's ecological systems. In arid, irrigated regions, groundwater is often the only source of freshwater. Uzbekistan has about 100 known groundwater deposits, of which 77 are freshwater reserves [6,7]. These supply water to 69 cities, 335 towns, and nearly 3,000 rural settlements.

Over the last 50 years, rapid industrial and agricultural development has negatively impacted Uzbekistan's freshwater reserves. Groundwater reserves have decreased by 35%, and some aquifers have been depleted due to unauthorized construction of water intake structures and uncontrolled water extraction [7].

It should be noted that rapid agricultural development and the expansion of land use have led to groundwater degradation and soil deterioration. A clear example is the development of the Golodnaya Steppe, where river runoff picks up soluble

salts as it flows through agricultural landscapes. Existing drainage systems for surface aquifers are insufficiently effective, causing groundwater levels to rise and approach the surface, leading to soil degradation and salinization.

Such issues are particularly evident in the Syrdarya and Jizzakh regions of Uzbekistan and neighboring areas in Kazakhstan. The condition of the soil layer is directly linked to water availability and groundwater depth, which negatively affects agricultural crop yields.

Global food security data reveals the following conclusions:

1.7 billion people worldwide are at risk of falling into poverty;

Turkey is one of the most dependent countries on wheat imports from Russia and Ukraine;

In 2019, Egypt received 70% of its total grain imports from Russia, and by 2021, 41% of Egyptians at times could not afford to buy food;

The situation is even more dire in Kenya, another country dependent on Russian supplies: in 2021, 69% of the population at times could not afford food.

This is largely due to the significant share of Russia in global food production: 30% of wheat and barley, 20% of corn, and more than 50% of sunflower oil. The agricultural output of these two countries is a critical food source for the poorest populations.

In this context, the study of irrigation regimes in the cultivation of winter wheat is of great importance, as the efficiency of mineral fertilizers directly depends on maintaining optimal soil moisture. According to scientific literature, the water demand and development of winter wheat vary based on biological characteristics, soil conditions, and growth phases.

For agricultural crops—especially winter wheat under irrigated farming—soil moisture is the primary factor influencing yield. Under normal (optimal) moisture conditions, wheat can withstand heat up to 45°C, which is a common temperature during the growing season in Uzbekistan [5–7].

In conclusion, yield is directly influenced by the irrigation regime, while maintaining proper fertilizer application. It is also essential to account for soil characteristics, climatic conditions, and the integration of new technologies in agriculture.

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TEKISLIKDAGI IKKI NUQTA ORASIDAGI MASOFA TUSHUNCHASINI BA'ZI IQTISODIYOT MASALALARIGA TADBIQ ETISH

Annotatsiya: *Ushbu maqolada geometriyadagi ikki nuqta orasidagi masofa tushunchasining iqtisodiyot sohasiga tadbiqi ko'rib chiqiladi. Ikki nuqta orasidagi masofa formulasining matematik asoslari yoritilib, uni iqtisodiy ko'rsatkichlar asosida ob'yektlar (ishlab chiqaruvchilar, iste'molchilar) orasidagi o'xshashlik yoki farqlilikni aniqlash vositasi sifatida taklif etiladi. Maqolada narx va sifat, daromad va bandlik kabi ikki o'lchamli ko'rsatkichlar bo'yicha masofa hisoblash orqali transport va logistikada optimal yo'llar, portfel menejmenti, investitsiyalarda va ma'lumotlar analitikasida klasterlash kabi muammolarni yechishga qaratilgan yondashuvlar keltiriladi.*

Kalit so'zlar: *Ikki nuqta orasidagi masofa, iqtisodiy tahlil, narx va sifat, ikki o'lchamli model, transport va logistika, portfel boshqaruvi, klasterlash, o'xshashlik va farqlilik.*

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APPLICATION OF THE CONCEPT OF DISTANCE BETWEEN TWO POINTS ON A PLANE TO CERTAIN ECONOMIC PROBLEMS

Abstract: *This article explores the application of the geometric concept of the distance between two points in the field of economics. The mathematical foundations of the distance formula are presented, and its use is proposed as a tool for identifying similarity or difference between objects (producers, consumers) based on economic indicators. The article introduces approaches to solving problems by calculating distances based on two-dimensional indicators such as price and quality, income and employment, in areas such as optimization of routes in transport and logistics, portfolio management, investment analysis, and data clustering.*

Keywords: *Distance between two points, economic analysis, price and quality, two-dimensional model, transport and logistics, portfolio management, clustering, similarity and difference.*

Kirish Matematikada ikki nuqta orasidagi masofa tushunchasi geometriyaning asosiy elementlaridan biri hisoblanadi. Bu tushuncha faqatgina analitik geometriyada emas, balki amaliy fanlar, xususan, iqtisodiyotda ham turli

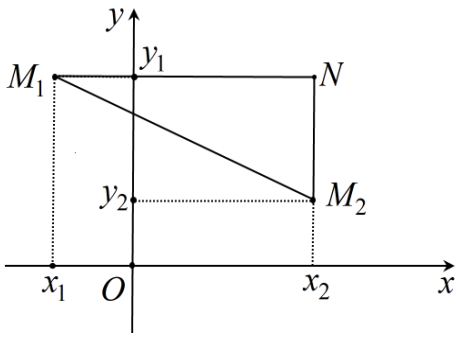
sohalarda foydali bo‘lib xizmat qilmoqda. Ushbu maqolada nuqta orasidagi masofa formulasini iqtisodiy muammolarga tadbiq etish, ya’ni iqtisodiy ob‘yektlar orasidagi o‘xshashlik va farqlilikni o‘lchashda qanday foydalanish mumkinligini yoritamiz. Bundan avval nuqta orasidagi masofani topishning matematik asosini keltiramiz[1].

Dekart tekisligi Oxy da $M_1(x_1;y_1)$ va $M_2(x_2;y_2)$ nuqtalar berilgan bo‘lsin. Biz bu ikki nuqta orasidagi masofa $|M_1M_2|$ni topishning formulasini 1-chizmadan kelib chiqishini ko‘rsatamiz.

Chizmadagi ΔNM_1M_2 to‘g‘ri burchakli uchburchakda $|NM_1|$, $|NM_2|$ uchburchakni katetlari, $|M_1M_2|$ esa gepotenuza ekanligini ko‘rishimiz mumki. Pifagor teoremasiga ko‘ra:

$$|M_1M_2|^2 = |M_1N|^2 + |M_2N|^2,$$

$$|M_1N| = |x_2 - x_1|,\ |M_2N| = |y_2 - y_1|.$$



1 – chizma

Bu yerda biz gepotenuzani ya’ni $d = |M_1M_2|$ ni topamiz:

$$d = |M_1M_2| = \sqrt{|M_1N|^2 + |M_2N|^2} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \qquad (1)$$

Hosil bo‘lgan (1) formula tekislikda berilgan ikki nuqta orasidagi masofani topish formulasi deyiladi.

Misol. Tekislikda M_1 (-1; 3) va M_2(2; -1) nuqtalar berilgan bo‘lsa, ular orasidagi masofa toping.

Yechish. Berilgan nuqtalar orasidagi masofani topish uchun (1) formuladan foydalanamiz.

$$d = |M_1M_2| = \sqrt{(2-(-1))^2 + (-1-3)^2} = \sqrt{4^2 + 3^2} = 5 \ \textit{uzunlik birlik}.$$

Ikki nuqta orasidagi masofani hisoblash tushunchasi turli sohalarda tadbiq qilinadi. Xususan, iqtisodiy ko‘rsatkich orqali tavsiflangan ob‘yektlar orasidagi masofani hisoblash uchun (1) dan foydalaniladi.

Tekislikdagi ikki nuqta orasidagi masofa tushunchasini iqtisodiy sohalarda qo‘llash haqidagi bir nechta misollar keltiramiz:

Transport va logistikada optimal yo‘llar: Logistika sohasida mahsulotlarni yetkazib berish uchun eng qisqa (yoki eng arzon) yo‘lni topish muhimdir. Bunda:

Har bir shahar yoki joy nuqta deb hisoblanadi.

Masofa - bu fizik masofa (km), narx (yetkazib berish xarajatlari) yoki vaqt (yo‘lga ketgan vaqt).

Masalan :

Agar A shahardan B shaharga mahsulot yetkazib berish kerak bo‘lsa, masofani hisoblash quyidagicha bo‘ladi:

$$Umumiy\ xarajat = (Fizik\ masofa) \times (Kilometr\ boshiga\ xarajat)$$

Bu yerda “masofa”ni minimallashtirish orqali kompaniya xarajatlarni kamaytiradi.

Portfel menejmenti va investitsiyalarda: Investitsiya portfelini tuzishda har bir aktivning riski va daromadi nuqtalar koordinatalari sifatida ko‘rib chiqiladi. Bu holda “ikki nuqta orasidagi masofa” - bu ikki investitsiya varianti orasidagi risk va daromad farqi.

Masalan: Aksiyalar portfelini diversifikatsiya qilishda:

X aksiyasi: Risk = 5%, Daromad = 8%, *Y* aksiyasi: Risk = 7%, Daromad = =10%. Ushbu ikki aksiya orasidagi “masofa” quyidagicha hisoblanishi mumkin:

$$d = \sqrt{(Risk_Y - Risk_X)^2 + (Daromad_Y - Daromad_X)^2}$$

Bu formula yordamida investorlar turli aktivlar orasidagi farqlarni baholaydilar va optimal kombinatsiyani tanlaydilar.

Ma’lumotlar analitikasida klasterlash: Iqtisodiyotda ma’lumotlar analitikasi juda muhimdir. Masalan, mijozlar bazasini tahlil qilishda klasterlash algoritmlari
(*k-means, hierarchical clustering*) foydalaniladi. Klasterlashda “ikki nuqta orasidagi masofa” - bu ikki ma’lumot nuqtasi (mijozlar, mahsulotlar) orasidagi o‘xshashlik yoki farq[2].

Masalan :

Mijozlarni guruhlarga ajratishda:

Mijoz A: Yosh = 30, Daromad = $50,000,

Mijoz B: Yosh = 35, Daromad = $55,000.

Ularning orasidagi masofa quyidagicha hisoblanadi:

$$d = \sqrt{(Yosh_B - Yosh_A)^2 + (Daromad_B - Daromad_A)^2}\ .$$

Bu masofa qanchalik kichik bo‘lsa, mijozlar shunchalik o‘xshash bo‘ladi.

“Ikki nuqta orasidagi masofa” tushunchasi iqtisodiyotning turli sohalarda keng qo‘llaniladi. Ushbu tushuncha fizik masofadan tashqari, narxlar, risklar, ma’lumotlar va boshqa abstrakt parametrlar orasidagi farqlarni ham o‘lchash imkonini beradi. Bu esa firmalar, hukumatlar va shaxsiy investorlar uchun qaror qabul qilishda muhim vosita bo‘lib xizmat qiladi[2,3].

Misol: (*Mijozlarni daromad va xaridlariga ko‘ra klasterlash masalasi*). Faraz qilaylik, biror kompaniya mijozlari bazasini tahlil qilmoqda va mijozlarni ularning daromadi va o‘tgan oydagi xaridlari miqdori bo‘yicha guruhlarga ajratmoqchi. Kompaniya quyidagi ma’lumotlarga ega:

Mijoz	Daromad (ming $)	Xaridlar ($)
A	50	200
B	60	300
C	40	100

Mijozlar orasidagi “masofani” hisoblab, ulardan qaysilari bir-biriga yaqinroq (ya’ni o‘xshash) ekanligini aniqlash.

Yechish. Biz har bir mijozning ikkita parametri ya’ni daromad (x), va xaridlar (y) $ da ifodalanadigan nuqtalarning koordinatalarini tuzamiz. Nuqtalar koordinatalari quyidagicha: $A(50;200)$, $B(60;300)$, $C(40;100)$.

Har bir juftlik uchun masofani (1) dan foydalanib topamiz:

$$d_{AB} = \sqrt{(60-50)^2 + (300-200)^2} = \sqrt{10100} \approx 100.5\,,$$

$$d_{BC} = \sqrt{(40-60)^2 + (100-300)^2} = \sqrt{40400} \approx 201\,,$$

$$d_{AC} = \sqrt{(40-50)^2 + (100-200)^2} = \sqrt{10100} \approx 100.5\,.$$

Xulosa. Ikki nuqta orasidagi masofa formulasini iqtisodiy tahlilga tadbiq etish orqali turli obyektlar - firma, iste’molchi, region va mahsulotlar o‘rtasidagi o‘xshashlik va farqlilikni baholash mumkin[4]. Bu yondashuv qaror qabul qilish, segmentatsiya, mahsulot joylashtirish va raqobatchilar tahlili kabi sohalarda samarali vosita bo‘la oladi.

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SHARQ VA G'ARB AXLOQIY MADANIYATINING UMUMIY MANZARASI

Annotatsiya. *Ushbu maqolada talabalarda ma’naviy-axloqiy tarbiyani shakllantirishning ahamiyati va uning pedagogik mazmuni haqida so‘z yuritilgan.*

Kalit so‘zlar: *ma’naviy tarbiya ta’lim tarbiya sifati, axloqiy ong, poklik, vatanparvarlik ruhida tarbiyalash, ijtimoiy-axloqiy talab, xulq-atvor, axloqiy tarbiya, axloqiy me’yor*

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GENERAL VIEW OF EASTERN AND WESTERN MORAL CULTURE

Abstract. *This article discusses the importance of developing students' spiritual and moral education and its pedagogical content.*

Keywords: *spiritual education, quality of education, moral consciousness, purity, education in the spirit of patriotism, social and moral requirements, behavior, moral education, moral standards.*

Sharqning buyuk mutafakkirlari insonni axloqiy kamol toptirish, uni har tomonlama rivojlantirish, ma’naviy va ma’rifiy jihatdan kamol topish jarayonida turli tarixiy bosqichlardan –johillik, nodonlikdan ilmga, yovuzlikdan ezgulikka, vahs’hiylikdan insoniylikka o’tarkan, jamiyat ham s’hu tariqa rivojlanadi. Ikki muqobil ibtido – yovuzlik va ezgulik, jaholat va kamolatning o’zaro kuras’hi inson va jamiyat taraqqiyoti belgilagan, inson aql-zakovat sohibi sifatida o’zini anglas’higa olib keladi.

Axloq muayyan jamiyat va davrda o’zgaris’hlarga uchras’hi, rivojlanis’hi, so’nis’hi mumkin. Har bir xalqning yoki millatning o’ziga xos axloqi bilan bir qatorda, umumbas’hariy axloq me’yorlari jamiyatning umumiy taraqqiyotiga samarali ta’sir ko’rsatadi.Axloqiy tarbiyaning barcha zamonlar uchun dolzarb bo’lgan yo’li bu – namunaviylik tamoyili. Oilada, avvalo, yuqorida aytilganidek, ota-ona bolaga axloqiy namuna bo’lis’hi kerak. Maktabda va oliy o’quv yurtida muallimlarining ta’lim beris’h usullaridan tortib ularning ko’z ilg‘amas xatti-

harakatlarigacha o’z s’hogirdlari tomonidan s’haxsiy namuna sifatida qabul qilinis’hini nazardan qochirmaslik lozim.

Qadimgi Xitoydagi ijtimoiy-falsafiy fikrlar tarixida Konfutsiyning qaras’hlari ham alohida o’rin tutadi.Qadimgi Xitoydagi ijtimoiy-falsafiy fikrlarning rivojiga katta hissa qo’s’hgan. Mutafakkirning “Aforizmlar” asari teran falsafiy qaras’hlarida axloqiy masalalar markaziy o’rin tutadi.Qadimgi ajdodlarning urf-odatlari, meroslari, tariqatiga tayangan Konfutsiy o’tganlarning s’huhrati ularning avlodlarini yuksaltiradi, deb jamiyatning haqiqiy negizi, poydevorini yanada mustahkamlas’h uchun qadimgi urf-odat an’ana milliy marosim va bayramlarimizning, ajdodlarimizning tarixiy xotiralarining tiklanis’hi borasidagi ma’naviy-ma’rifiy islohotlarimizda ko’ris’himiz mumkin.

Suqrot (eramizdan oldingi 469-399-yillar) - qadimgi Yunon faylasufi. Afinaning ijtimoiy hayotida faol is’htirok etgan, yos’hlar tarbiyasi bilan s’hug‘ullangan, hurfikrli inson, bo’lgan Suqrotning fikricha, falsafaning markazida axloq masalalari turmog‘i lozim. Jamiyatning ravnaqi, tinchlik va osoyis’htaligi, faravon hayoti axloq va odobning ahvoliga bog‘liq. Bu masalalar S’harq falsafasida ham katta o’rin tutganligi bois xalqimiz, buyuk allomalarimiz Suqrot nomini hurmat bilan tilga olgan, uning axloq-odob haqidagi pand-nasihatlariga amal qilis’hgan.

Umuman, qadimgi S’harq va G‘arb falsafasining ijtimoiy muammolari orasida axloq mavzusi etakchilik qiladi. O’s’ha davrda yaratilgan hikmatli so’z, iboralar bugungi kunda ham insonni mulohaza yuritis’hga majbur qiladi. S’harqda nafaqat din sifatida, balki yaxlit madaniyat, ma’naviyatning s’hakllanis’hida ham katta ahamiyatga ega bo’ldi. U madaniyatning ilm-fan, san’at, axloq, siyosat kabi sohalarining rivojiga ham ijobiy ta’sir ko’rsatdi.Bu davrda diniy ilmlar sohalarida mintaqa s’huhratini olamga tanitgan imom Buxoriy, imom Termiziy, Nizomulmulk, Dunyoviy ilmlar sohasida esa Forobiy, Beruniy, Ibn Sino, hamda tasavvuf ma’naviy-ma’rifiy ta’limoti sohasida Ahmad Yugnakiy, Yusuf Xos Hojib, Najmiddin Kubro, Bahouddin Naqs’hband va bos’hqa buyuk alloma va mutafakkirlarning jamiyat taraqqiyoti rivojida ma’naviyat hodisasining beqiyos o’rni haqidagi qaras’hlari butun jahon ilmiy va falsafiy tafakkurining ravnaqiga hayotbaxs’h hissa qo’s’hdi.

Abu Nasr Forobiy (873-950) jahon ijtimoiy-falsafiy fikrlari tarixida “S’harq Aristoteli” (“Ikkinchi muallim”) degan unvonga sazovor bo’lgan mas’hhur qomusiy olimdir. Forobiy o’zining ijtimoiy-falsafiy qaras’hlarida jamiyatning vujudga kelis’h sabablarini, axloqning s’hakllanis’hi, insoniylik, adolatparvarlik, taraqqiyot, buyuk jamiyat, komil inson kabi mavzularni ilmiy-nazariy jihatdan asoslas’hga harakat qilgan. Forobiy axloqiy fazilatlar deganda bilimdonlik, donolik, va mulohazali bo’lis’h, vijdonlilik, kamtarlik, ko’pchilik manfaatini yuqori qo’yis’h, haqiqat, ma’naviy yuksaklikka intilis’h, adolatliylik kabi xislatlarni tus’hunadi. Ammo bu xislatlarning eng muhimi har bir insonning bilimli, ma’rifatli bo’lis’hidir.

S’huning uchun ham Forobiy axloq tus’hunchasiga aql bilan uzviy bog‘liq holda, tafakkurga asoslangan axloq sifatida qaraydi. Bundan biz Forobiyning xloqni xulq me’yorlari ifodasi sifatidagina emas, balki kis’hilarning aqliy faoliyatining natijasi sifatida ham talqin etilganligini ko’ramiz S’hu kabi fikrlarni biz Abu

Rayhon Beruniy (973-1048 y.) asarlarida ham uchratis'himiz mumkin. Beruniyning ma'naviy-qxloqiy qaras'hlari bilan bog'liq ta'limotida mehnat, odob-axloq, ta'lim-tarbiya, kasb-hunar, ilm-ma'rifat uzviy mus'htaraklikda, bir butunlikda tahlil etilgan.

Beruniyning ma'naviy-axloqiy ta'limotida ikkiyuzlamachilik, yolg'onchilik, tuhmat, qo'pollik, o'g'rilik, bir-birining payiga tus'his'h, xudbinlik, singari yomon xulqlar toifasiga kiritiladi. Rostlik, odillik, adolat, bular Beruniy fikricha, yuksak ma'naviyat, go'zal odob-axloq belgisidir. O'z zararing hisobiga bo'lsa-da, rost gapir, haqiqatdan yuz o'girma, har bir narsaga odilona va xolisona yondas'h, deb ta'lim beradi va o'zi mazkur g'oya va ta'limotlarga bir umr sodiqlikning ibrat-namunasiga aylanadi.

Beruniyning fikricha, insonparvarlik-kis'hilarning ma'naviyat darajasi, u o'zida ijobiy axloqiy xislatlarni tarbiyalay olis'hi bilan ham bog'liq. "Saxix" yo'nalis'hining asoschisi eng etuk va mas'hhur muhaddis Abu Abdulloh Ismoil al-Buxoriy hadis ilmida "Amir-ul-mo'minin", "Imom al-Muxaddisiyn" (Barcha muxaddislarning pes'hvosi") degan s'harafli nomga sazovor bo'lgan. Islom dini insonni ma'naviy kamolot sari etaklovchi ta'limotdir. S'hu sababli Qur'oni Karimda ham, hadislarda ham yaxs'hi xulq-odob qoidalari va ularga kis'hilarning qat'iy amal qilis'hlari lozimligi borasidagi qaras'hlar keng targ'ib etilgan.

Imom Ismoil al-Buxoriyning "Aljome as-saxix" asarining bir jildiga odob-axloq masalalarini yorituvchi hadislar jamlangan bo'lsa, "Al-adab al-mufrad" (Adab durdonalari) nomli asarda ham ijtimoiy turmus'hda hamda insonlar o'rtasida o'zaro munosabatlarni tas'hkil etis'h chog'ida amal qilinis'hi lozim bo'lgan odob-axloq qoidalari borasida yanada batafsil ma'lumotlar berilgan. Najmiddin Kubroning maqsadi odamlarni ham jismonan, ham aqlan, ham ruhiy-ma'naviy jihatdan etuk qilib tarbiyalas'h bo'lgan. Ta'lim-tarbiya axloqiy poklik, mardlik, hojatbarorlik, g'oyalarini targ'ib etgan. Ilohni sevis'h bilan yaxs'hi insonlarni sevis'hni birga olib qaradi, nafsni qattiq nazorat etib, ya'ni qoralab, ulug' taqvo piri degan nom chiqardi. U insonni "Kichik olam" deb, uning kamoloti cheksiz ekanini ta'kidlaydi. Biz bu fikrlarni xulosalab tarbiya axloqiy poklik, mardlik, hojatbarorlik kabi tus'hunchalarni olis'himiz mumkin.

Bahouddin Naqs'hbandning ta'lim-tarbiya haqidagi fiklari g'oyat qadrlidir. U barkamol insonni tarbiyalas'h dastlab odobdan bos'hlanis'hini ta'kidlab, s'hunday degan edi: "Adab xulqni chiroyli qilis'h, so'z va fe'lni soz qilis'hdir". Odob saqlas'h-muhabbat samarasi, yana muhabbat daraxtining urug'i hamdir. Agar odobdan ozgina nuqsonga yo'l qo'yilsa, nimaikiqilsanh ham, beadablik ko'rinadi, degan fiklarni keltirib o'tgan. S'harq mutafakkirlari axloqni ikkiga ajratis'hadi. Axloqli, axloqsiz, yaxs'hi yoki yomon axloqli singari axolqiy munosabatlar – bu jamiyatga, mehnatga, odamlarga va qolaversa, har bir kis'hining o'ziga munosabatidir.

G'arb mutafakkirlari ham axloqiy tarbiya borasida o'zlarini fiklarining keltirb o'tganlar. Jumladan, Us'hinskiy "Tarbiyaning asosiy vazifasi axloqiy jihatdan ta'sir etis'hdan iboratdir. Bu aqlni umuman o'stiris'h, uni bilimlar bilan to'ldiris'hdan ko'ra muhimdir" deb izohlagan. Axloqiy tarbiya maqsadlari va vositalarini,

K.D.Us’hinskiy kis’hi kamolga etgan bo’lis’hi, uning jismoniy, aqliy hamda axloqiy jihatdan o’sis’hi bir-biriga mos bo’lis’hi kerak, deb hisoblaydi. S’huning uchun u tarbiyani garmonik (har tomondan bir-biriga moslab) o’sgan s’haxsning tarkib topis’hida ma’lum maqsadga qaratilgan ongli jarayon deb ta’riflaydi.

Us’hinskiyning fikricha, axloqiy tarbiya bolada insonparvarlik, vijdonlilik, rostgo’ylik, mehnatsevarlik, intizomlilik va mas’uliyatni sezis’h, kamtarlik bilan birgalikda o’z qadrqimmatini bilis’hni o’stiris’hi lozim. Us’hinskiy tavsiya etgan axloqiy tarbiya tizimida uning xalqchillikka asoslangan butun pedagogik tizimiga muvofiq vatanparvarlik, vatanga fidokorona muhabbat ruhida tarbiyalas’h asosiy o’rinni egallaydi. Vatanga muhabbat, - deb yozadi Us’hinskiy, - bu insonning eng kuchli tuyg‘usidir.

Us’hinsiyning fikricha, axloqiy tarbiyaning vositalari quyidagilardan iborat bo’lis’hi kerak;

- Axloqiy tarbiyada kitob va darslikning o’rni kattadir. O’quvchi bu kitoblarda o’z nutqini o’stiris’hni, bilimni umumlas’htiris’hni axloqiy tarbiyalarni egallas’hni tez o’rganadi;
- O’qituvchining s’haxsan o’zi namuna bo’lis’hi kerak;
- Ye’tiqodga u juda katta e’tibor bergan edi;
- O’quvchilarga mohirlik bilan munosabatda bo’lis’h (pedagogik odob);
- Ogohlantiris’h choralari;
- Rag‘batlantiris’h va jazolas’h;

Suqrotning fikricha, tarbiyadan kutilayotgan maqsad, buyumlar tabiatini o’rganis’h bo’lmay, balki kishining bilim olishi, axloqni kamol toptirishi kerak. Lekin Suqrotning axloqiy qarashlarida tengsizlikni yaqqol sezish mumkin. Uning fikricha axloq faqat imtiyozli "mumtoz "largagina xos, chunki ular haqiqiy axloqning yagona egalari bo’lganliklari uchun hokimiyat ham ularning qo’llarida bo’lmog‘I kerak deydi.

Arastu uch xil tarbiya ya’ni: jismoniy, axloqiy va aqliy tarbiya aqidalarini is’hlab chiqib, tarbiyaning rivojlanis’higa katta hissa qo’shgan. U jismoniy, axloqiy va aqliy tarbiya bir-biri bilan uzviy bog‘langan deb hisoblaydi. Arastu Platondan farq qilib, bola tarbiyasida oila tarbiyadan chetlas’htirilmaydi. Axloqiy tarbiya beris’h asosan oila zimmasida ekanligini uqtiradi.

XULOSA

Xulosa qilib shuni aytish joizki, o’z davrida Sharq va G‘arb allomalarining axloqiy tarbiya borasidagi fikrlari ma’rifatparvarlarning asarlarida o’z aksini topgan. Muhammad al-Xorazmiy, Abu Nasr Forobiy hamda Abu Rayhon Beruniylar o’qituvchining ma’naviy-axloqiy jihatdan etuk bo’lishlariga alohida ahamiyat qaratadilar. Ularning fikrlaricha, yaxs’hi o’qituvchi bos’hqalardan bir jihati bilan farq qiladi, ya’ni, u o’zi ega bo’lgan bilimlarni yoshlarga beminnat o’rgatadi, har bir ishda ularga namuna bo’la oladi [6].

G‘arb allomalaridan Ushinskiy, Makarenko, Komensiy, Platon, Suqrot, Aristotel kabi g‘arb allomalari o’zlarining pedagogik qarashlari bilan o’z ancha ilgarilab ketganlar. Ularning bu qaras’hlari bir necha asrlardan beri ajdodlarimiz tafakkurini boyitib kelmoq va hozirgi kunda ham ular o’z qiymatini yo’q. Shunga

ko’ra, Sharq va G‘arb mutaffakkirlarning o’lmas merosi oilada bolalarning ma’naviy-axloqiy tarbyalashning muhim omili bo’lib qoladi. Shunday ekan biz pedagoglar ta’lim jarayonida tarbiyaning ham uzviyligini ta’minlagan holda talaba yoshlarga ma’naviy-axloqiy tarbiya berib boris’himiz va ularga to’g‘ri yo’lni ko’rsatadi.

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IMPROVING IRRIGATION EFFICIENCY AND SOIL MOISTURE DISTRIBUTION ON TERRACED SLOPES OF ADYR LANDS IN THE FERGANA VALLEY

Annotation: *The article explores methods to enhance irrigation efficiency and soil moisture distribution on terraced adyr lands in the Fergana Valley. A low-pressure irrigation network was developed to adapt to complex terrain, reduce water loss, and prevent soil erosion. Field experiments confirmed improved irrigation performance, labor productivity, and water savings up to 2200 m³/ha per season.*

Keywords): *adyr lands, terraced slopes, surface irrigation, furrow irrigation, low-pressure irrigation network, soil erosion control, water use efficiency, hydraulic modeling, slope agriculture.*

The cultivation and irrigation of agricultural crops on complex adyr lands—characterized by steep and sloping hillsides—poses a significant risk of water-induced soil erosion and creates serious difficulties in the mechanization of fieldwork operations.

Adyrs are sharply elevated landforms that rise above the surrounding plains in the form of elongated ridges. They are marked by their fragmented contours and scattered distribution.

The lack of conveniently cultivable land areas has necessitated extensive efforts to develop the adyr regions of the Fergana Valley in the Republic of Uzbekistan. The climate of the Fergana Valley is dry, sharply continental, and has a long frost-free period. The high accumulated temperature levels allow for the cultivation of cotton and the development of subtropical crops, horticulture, viticulture, and melon growing.

Part of the adyr lands, characterized by steep slopes, has been developed through the construction of step terraces.

In our study, the level of potential for applying economically efficient irrigation methods in these areas was assessed through scientific and methodological analysis, taking into account the specific characteristics of regions with complex topography.

Many researchers (Kostiakov, 1960; Krivovyaz, 1966; Surin, 1982) consider drip irrigation to be ineffective under certain conditions, particularly:

it must be acknowledged that it is not suitable for areas with complex terrain and small, scattered land plots.

The objective of the research work was to increase the operational efficiency and productivity of terraced slopes on the adyr lands of the Fergana Valley by improving the on-farm irrigation network and surface irrigation technology using furrows.

As a result of the studies, the patterns of soil water regime formation on terraced slopes under conditions of distributed water application along the length of furrows were identified, as well as the hydraulic regime in the elements of the piped irrigation network with above-ground irrigation pipelines. Based on this, a design for a low-pressure irrigation network was developed (Surin, Sabitov, et al., 1991), along with new irrigation technologies and design methodologies for the irrigation network aimed at conserving irrigation water and protecting soil from degradation.

The high pressure naturally generated by the slope's terrain is reduced and maintained at a stable low pressure—ranging from 0.9 to 1.0 meters—with the help of devices installed for each row of plantings. The excess water volume, which exceeds the needs of the plants on the terraces, is transferred to the lower part of the slope through a distribution network.

The water flow delivered by these devices is distributed as an equal number of irrigation streams along the length of the furrows through holes of varying diameters, which are uniformly opened along the length of the irrigation pipes. The number and discharge of irrigation streams, as well as the spacing between the holes, are determined using special calculation methods based on the row length and its longitudinal slope. As a result, the irrigation process can be completed in a short period with a high level of quality.

This irrigation technique, which we recommend for use in intensive orchards or vineyards on adyr slopes, ensures that the water is evenly distributed over very short distances (1.5–4.0 meters) from the beginning to the end along the plant rows [1]. At the same time, the one-time irrigation rate is completed before ¾ to ⅘ of the furrow depth is filled with water.

The relationship between water level (H) in the furrow and specific water discharge (q_1) was established. Scientists (Kostiakov, 1960; Surin, 1982) have identified the following patterns of furrow irrigation:

$$\upsilon = (\upsilon_n - \upsilon_u)\, e^{kt} + \upsilon_u ;$$

Where: υ – infiltration rate of water into the soil, m/hour;

υ_n – initial infiltration rate of water into the soil, m/hour;

υ_u – steady-state infiltration rate of water into the soil, m/hour;

e – base of the natural logarithm;

k – proportionality coefficient of water movement along the furrow, 1/hour;

t – duration of water application into the furrow, hours.

The distance X that the irrigation stream travels is given by:

$$X = L_0 (1 - B\, e^{kt}) ;$$

Where: X – distance the irrigation stream reaches, m;

L_0 – maximum reach distance of the irrigation stream, m;

B – dimensionless parameter.

The maximum reach distance of the irrigation stream (**L_0**) is determined by the formula:

$$L_0 = 3.6q_б / \mu \chi \upsilon_u ;$$

Where: $q_б$ – flow rate of water supplied into the furrow, L/s;

μ – coefficient accounting for the reduction in wetted perimeter;

χ – wetted perimeter at the beginning of the furrow, m.

Based on the above relationships, we conducted hydraulic calculations, which allowed us to describe empirical formulas for the process of water accumulation in small streams, water consumption, and water level increase over time (Shevelev, 1984).

Field experiments were conducted using different specific water flow rates ranging from 0.0016 to 0.006 L/s·m. During the experiments, the dynamics of water level changes inside the furrows were studied.

A technique was developed for conducting these experiments, which matched the non-traditional nature of the irrigation process. One of the main objectives of the field experiments was to monitor the accumulation of a specific amount of water in the field.

Based on graphical data obtained from field experiments, it can be concluded that when the specific water flow rate ranged from 0.0015 to 0.005 L/s·m, the amount of water corresponding to an irrigation norm of 800–1000 m³/ha was equivalent to a water column height of 0.04 to 0.12 m. The water pressure was regulated using a water meter; the irrigation duration ranged from 8 to 22 hours.

Using this process, it became possible to determine the maximum specific water flow rate. An experiment conducted at 0.006 L/s·m showed that when the irrigation rate reached 75–80%, the furrow volume reached full capacity for the given soil condition.

The results of the experiments show that the proposed irrigation technique allows for safe irrigation from the standpoint of preventing irrigation-induced soil erosion, while also ensuring high-quality irrigation in a very short period on terraced plots.

Operational use of the proposed irrigation network demonstrates its reliability and high efficiency:

– Labor productivity of irrigation workers increased from 0.12 to 3–5 ha per shift compared to existing irrigation technologies;

– Irrigation water savings during the growing season amounted to 2200 m³/ha;

– Safe irrigation and terrace stability were ensured;

– High uniformity coefficient of soil moisture along the furrow length (0.90–0.96);

– Significant reduction in irrigation duration of a modular plot (3–5 hours).

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METHODOLOGY OF ORGANIZING INTERDISCIPLINARY INTEGRATION ON THE SUBJECT OF TRACES OF A STRAIGHT LINE

Annotation. *In this article, the integration of creating the trace of a straight line with points of intersection with the projection planes in the science of "higher mathematics" and the science of "drawing geometry" and examples of making the trace of a straight line are presented.*

Key words: *projection, plane, trace of a straight line, integration, horizontal projection, horizontal, frontal, profile trace, horizontal trace of a straight line, frontal trace of a straight line.*

1.Introduction

It should be noted that the president paid special attention to mathematics during his visit to research institutes on Olimlar Street of our capital on January 31, 2020.. At the meeting, the need to increase interest in mathematics among young people, the need to properly organize the work of selecting talented children and enrolling them in specialized schools and later higher education institutions, creating popular textbooks and training manuals for students on this subject written in simple and understandable language, instilling mathematical consciousness, if necessary, from kindergarten the task of formation was set.

- Mathematics is the basis of all exact sciences. A child who knows this subject well will grow up to be smart, broad-minded, and work successfully in any field, - said the President.

Graphical geometry is a branch of mathematics that studies the methods of representing geometric bodies in a plane and in space. One of the basic elements of graphic geometry is the trace of a straight line - a point that remains on the surface of an object when it moves along a straight line.

The study of drawing geometry is of great importance for solving problems in mechanics, architecture, mechanical engineering and other fields where work with geometric objects is required.

The study of graphic geometry helps to develop students' spatial thinking, improve the skills of working with graphic images, and improve the quality of problem solving.It should not be forgotten that drawing geometry is not just a

theory, but a practical tool used in solving problems and designing various objects in real life. It should not be forgotten that drawing geometry is not just a theory, but a practical tool used in solving problems and designing various objects in real life.

2.Methods. In drawing geometry, the points of intersection of a straight line with projection planes are called traces of a straight line. A straight line in the general position intersects all projection planes. A straight line in a special case has one trace if it is a positioner and two traces if it is a level line.

Straight line traces can be used to determine the direction of motion of an object or to draw straight lines on a plane.. For example, in geodesy, straight-line traces can be used to determine the direction of movement or to construct graphical images that show the location of objects on the ground and other geographic features. In mechanical engineering, straight-line traces can be used to define points of contact between two surfaces, or to draw straight lines to help describe a design and understand how it works.

Point M is a horizontal trace of a straight line, point N is a frontal trace. The horizontal projection of the horizontal trace of the straight line M' coincides with the point M on the trace itself, and the frontal projection of this trace M'' lies on the Ox axis (Fig. 1). The frontal projection N'' of the frontal trace of a straight line corresponds to point N, and the horizontal projection N' lies on the Ox axis.

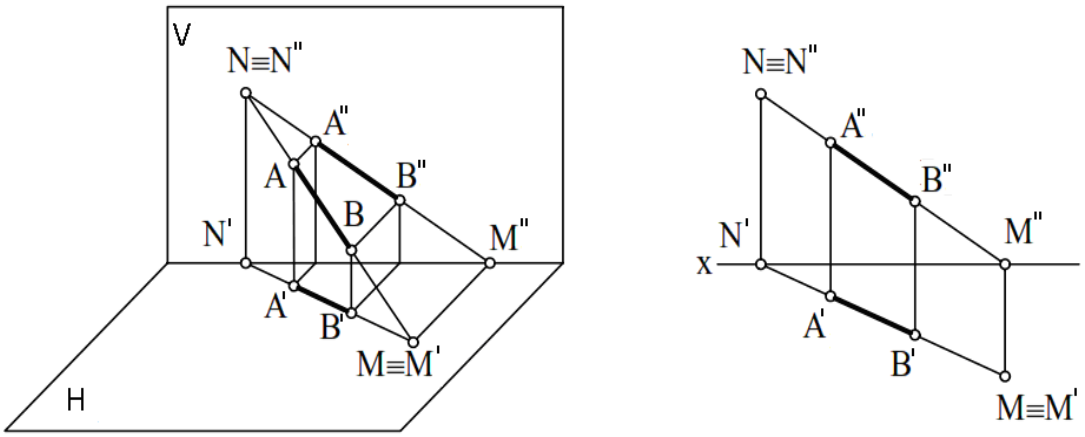

Fig. 1

To construct a horizontal trace M of a straight line, it is necessary to continue the frontal projection of the straight line until it intersects with the Ox axis, and at this point, transfer it perpendicularly until it intersects with the horizontal projection of the straight line.

To construct the frontal trace of a straight line, we continue the horizontal projection of the straight line until it intersects with the Ox axis, and from the point of intersection, we transfer it perpendicular to the axis of the axis until it intersects with the frontal projection of the straight line. In pictures 2-3 with these rules. Traces of straight lines a and b are constructed. To construct the frontal trace of a straight line, we continue the horizontal projection of the straight line until it intersects with the Ox axis, and from the point of intersection, we transfer it perpendicular to the

axis of the axis until it intersects with the frontal projection of the straight line. In pictures 2-3 with these rules. Traces of straight lines a and b

constructed.

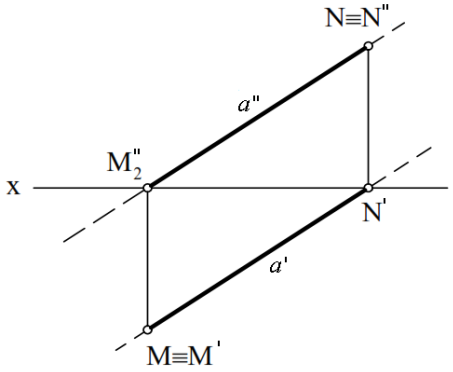

Fig. 2

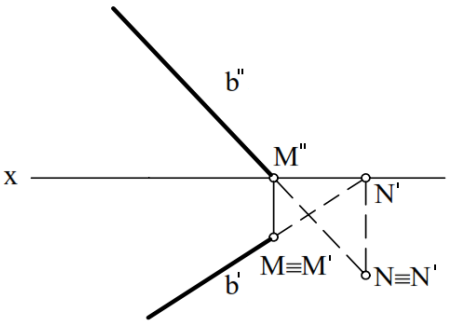

Fig. 3

Since the traces of straight lines are the points where a straight line passes from one quarter to another, they allow us to determine the appearance of this straight line. The part of the straight line inside the first octant is visible. The projections of the visible part of the straight line are represented by main lines, and the invisible ones by dashed lines.

Figure 4 shows the construction of traces of a straight line in a system of three projection planes.

The construction of horizontal and frontal traces is carried out according to the above rules, the profile trace P of a straight line is found as a point of intersection with the plane of profile projections. The profile projection of the straight line profile trace corresponds to the trace itself, the horizontal projection P' of this trace lies on the axis of the Moon; P'' frontal projection lies on the Oz axis. To construct a profile trace of a straight line, we continue the frontal projection of a straight line until it intersects with the Oz axis. We mark the point P'' and from this point we transfer the line perpendicular to the Oz axis until it intersects with the profile projection. This point P''' will be the profile trace of the straight line, which overlaps with P''. The horizontal projection R' of the profile trace is determined at the point of intersection of the horizontal projection of the straight line with the axis of the Moon (Fig. 5).

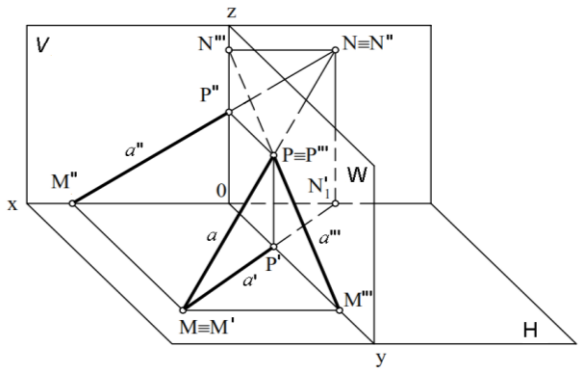

Fig. 4

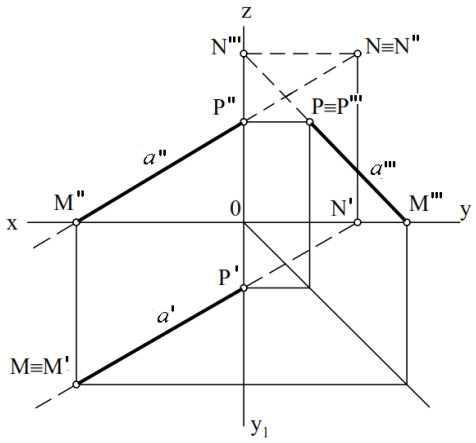

Fig. 5

Finding the horizontal and frontal traces of a given straight line based on the science of higher mathematics. and we determine that the vector according to the coordinates of the points is the direction vector of the straight line, and consider that the straight line passes through the point. Finding the horizontal and frontal traces of a given straight line based on the science of higher mathematics. and we determine that the vector according to the coordinates of the points is the direction vector of the straight line, and consider that the straight line passes through the point. *AB from the canonical equation of a straight line* $\frac{x-x_2}{x_2-x_1}=\frac{y-y_2}{y_2-y_1}=\frac{z-z_2}{z_2-z_1}$ *we form the general* $\begin{cases}(y_2-y_1)x-(y_2-y_1)x_2=(x_2-x_1)y-(x_2-x_1)y_2\\(z_2-z_1)x-(z_2-z_1)x_2=(x_2-x_1)z-(x_2-x_1)z_2\end{cases}$ *equation of a straight line*. We determine the point of intersection of the resulting *AB straight line* $oxy\ (z=0)$ with the $M_0^1(x_0^1;y_0^1;0)$ plane, $oxz\ (y=0)$ the point of intersection with the plane $M_0^2(x_0^2;0;z_0^2)$ and $oyz\ (x=0)$ the point of intersection with the plane $M_0^3(0;y_0^3;z_0^3)$.

$$M_0^1(x_0^1;y_0^1;0):\begin{cases}(y_2-y_1)x-(y_2-y_1)x_2=(x_2-x_1)y-(x_2-x_1)y_2\\(z_2-z_1)x-(z_2-z_1)x_2=(x_2-x_1)z-(x_2-x_1)z_2\\z=0\end{cases}\text{ point;}$$

$$M_0^2(x_0^2;0;z_0^2):\begin{cases}(y_2-y_1)x-(y_2-y_1)x_2=(x_2-x_1)y-(x_2-x_1)y_2\\(z_2-z_1)x-(z_2-z_1)x_2=(x_2-x_1)z-(x_2-x_1)z_2\\y=0\end{cases}\text{ point;}$$

$$M_0^3(0;y_0^3;z_0^3):\begin{cases}(y_2-y_1)x-(y_2-y_1)x_2=(x_2-x_1)y-(x_2-x_1)y_2\\(z_2-z_1)x-(z_2-z_1)x_2=(x_2-x_1)z-(x_2-x_1)z_2\\x=0\end{cases}\quad M_0^3(0;12{,}5;70)$$

point. *AB the horizontal trace of a straight line* is $oxy\ (z=0)$ the point of intersection $M_0^1(70;48{,}75;0)$ with the plane, and the frontal trace $oxz\ (y=0)$ is the point of intersection $M_0^2(14{,}28;0;55{,}71)$ with the plane.

3. Results and Discussion

Issue 1. $A(60;40;10)$ and $B(20;5;50)$ construct the horizontal and frontal traces of the given straight line AB through the coordinates of the points.

Solving. The first method is to construct the horizontal and frontal traces of the given straight line AB based on drawing geometry. According to the rules mentioned above, we construct the horizontal and frontal traces of the straight line AB. After finding the traces, we measure the coordinates of their projections and determine the following: horizontal trace point, $N(x=70;\ y=48{,}75;z=0)$ frontal trace point, $M(x=14{,}28;\ y=0;z=55{,}71)$ (Fig. 6).

The second method is to find the horizontal and frontal traces of a given straight line based on the science of higher mathematics. $A(60;40;10)$ and $B(20;5;50)$ we determine the vector according to the coordinates of $\overrightarrow{AB}=\{-40;-35;40\}$ of the points. $M_0(x_0;y_0;z_0)$ as $B(20;5;50)$ taking point coordinates AB *from the canonical equation of a straight line* $\frac{x-20}{-40}=\frac{y-5}{-35}=\frac{z-50}{40}$ AB *we derive the general equation of* $\begin{cases}x+z-70=0\\7x-8y-100=0\end{cases}$ *a straight line* . The resulting AB straight line AB *the point of intersection of,* $oxy\ (z=0)$ *a straight line* $M_0^1(x_0^1;y_0^1;0)$ *with a plane,* $oxz\ (y=0)$, $M_0^2(x_0^2;0;z_0^2)$ and $oyz\ (x=0)$ we determine the point of $M_0^3(0;y_0^3;z_0^3)$ intersection with the plane.

$$M_0^1(x_0^1;y_0^1;0):\quad \begin{cases}x+z-70=0\\7x-8y-100=0\\z=0\end{cases}\Rightarrow\begin{cases}x=70\\y=\frac{390}{8}=48{,}75\\z=0\end{cases}\Rightarrow\quad M_0^1(70;48{,}75;0)\quad \text{point;}$$

$$M_0^2(x_0^2;0;z_0^2):\quad \begin{cases}x+z-70=0\\7x-8y-100=0\\y=0\end{cases}\Rightarrow\begin{cases}x=\frac{100}{7}=14{,}28\\y=0\\z=\frac{390}{7}=55{,}71\end{cases}\Rightarrow\quad M_0^2(14{,}28;0;55{,}71)\quad \text{point;}$$

$$M_0^3(0;y_0^3;z_0^3):\quad \begin{cases}x+z-70=0\\7x-8y-100=0\\x=0\end{cases}\Rightarrow\begin{cases}x=0\\y=-\frac{100}{8}=-12{,}5\\z=70\end{cases}\Rightarrow\quad M_0^3(0;12{,}5;70)$$

point. AB *the horizontal trace of a straight line* oxy (z=0) *is the point of intersection with the plane,* $M_0^1(70;48{,}75;0)$ *is the point of intersection with the plane*, and frontal trace is $oxz\ (y=0)$ the point of intersection $M_0^2(14{,}28;0;55{,}71)$ with the plane *(Fig. 7).*

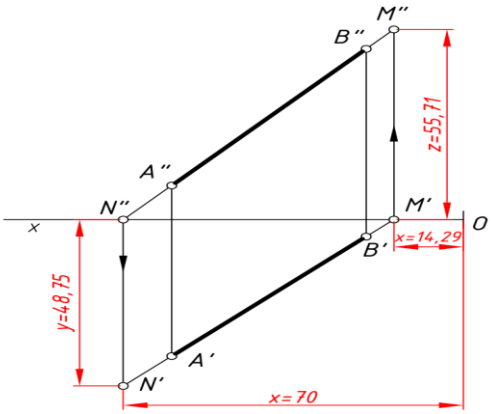

Fig. 6

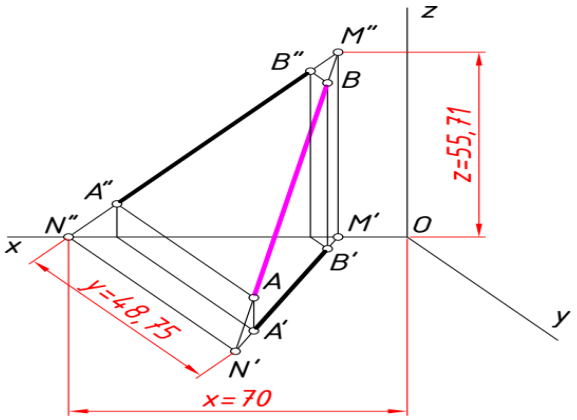

Fig. 7

Issue 2 $C(70;–30;10)$ and $D(20;15;40)$ construct the horizontal and frontal traces of the given straight line CD through the coordinates of the points.[20, 21, 22, 23]

Solving. The first method is to construct the horizontal and frontal traces of the given straight line AB based on drawing geometry. Since point C is located in the second octant, the horizontal trace of the straight line is located in the second octant (Fig. 7). To construct a horizontal trace of a straight line, we continue its frontal projection until it intersects with the Ox axis, and from the point of intersection, a line perpendicular to the Ox axis continues until it intersects with the horizontal projection of the straight line. The MD part of the straight line is visible because it is located in the first octant. To construct the frontalization of a straight line, we draw a perpendicular above the point where the horizontal projection of the straight line intersects with the axis Ox. The intersection of this perpendicular with the frontal projection of the straight line will be the point M of the frontal trace. After finding the traces, we measure the coordinates of their projections and determine the following: horizontal and $N(x=86{,}67;\ y=–45;z=0)$, frontal trace $M(x=36{,}67;\ y=0;z=30)$ point (Fig. 8).[24]

The second method is to find the horizontal and frontal traces of a given straight line based on the science of higher mathematics. $C(70;–30;10)$ and $D(20;15;40)$ we determine the vector according to $\overrightarrow{CD}=\{-50;45;30\}$ the coordinates of the points . $M_0(x_0;y_0;z_0)$ and $D(20;15;40)$ taking the coordinates of the point as CD *we form*

the canonical equation of a straight line $\frac{x-20}{-50}=\frac{y-15}{45}=\frac{z-40}{30}$ or $\frac{x-20}{-10}=\frac{y-15}{9}=\frac{z-40}{6}$ from AB *the general equation of a straight line from* $\begin{cases}9x+10y-330=0\\3x+5z-260=0\end{cases}$. According to AB straight line $oxy\ (z=0)$ point of intersection $M_0^1\left(x_0^1;y_0^1;0\right)$ with the plane, $oxz\ (y=0)$ we determine the point of intersection with the plane $M_0^2\left(x_0^2;0;z_0^2\right)$ and $oyz\ (x=0)$ the point of intersection with the plane. $M_0^3\left(0;y_0^3;z_0^3\right)$.

$$M_0^1\left(x_0^1;y_0^1;0\right):\ \begin{cases}9x+10y-330=0\\3x+5z-260=0\\z=0\end{cases}\Rightarrow\begin{cases}x=\frac{260}{3}=86{,}66\\y=-45\\z=0\end{cases}\Rightarrow\ M_0^1(86{,}66;-45;0)\ \text{point;}$$

$$M_0^2\left(x_0^2;0;z_0^2\right):\ \begin{cases}9x+10y-330=0\\3x+5z-260=0\\y=0\end{cases}\Rightarrow\begin{cases}x=\frac{330}{9}=36{,}66\\y=0\\z=30\end{cases}\Rightarrow\ M_0^2(36{,}66;0;52)\ \text{point;}$$

$$M_0^3\left(0;y_0^3;z_0^3\right):\ \begin{cases}9x+10y-330=0\\3x+5z-260=0\\x=0\end{cases}\Rightarrow\begin{cases}x=0\\y=\frac{330}{10}=33\\z=\frac{260}{5}=52\end{cases}\Rightarrow\ M_0^3(0;33;52)\ \text{point.}$$

AB the horizontal trace of a straight line is $oxy\ (z=0)$ the point of intersection $M_0^1(86{,}66;-45;0)$ with the plane , and the frontal trace is $oxz\ (y=0)$ the point of intersection with $M_0^2(36{,}66;0;52)$ the plane (Fig. 9).

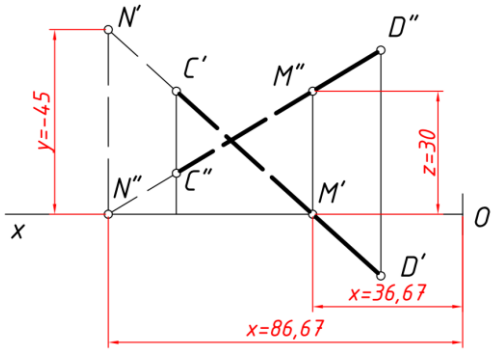

Fig. 8

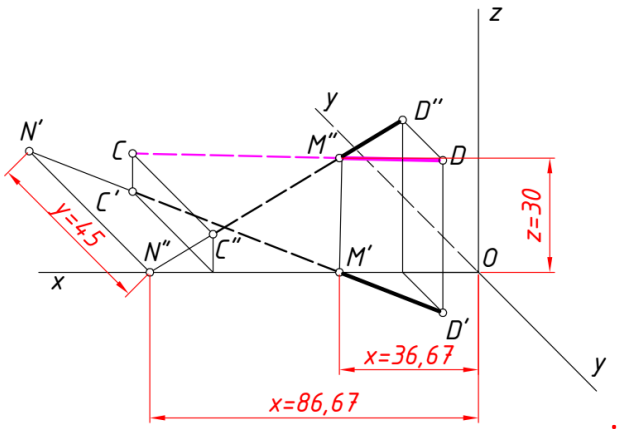

Fig. 9

4 Conclusions

When solving the given two problems, the following conclusion is reached.

In the first problem In the first method, AB *the horizontal trace of the straight line is* $N(x=70;\ y=48{,}75; z=0)$, the frontal trace, $M(x=14{,}28;\ y=0; z=55{,}71)$. In the second method , AB *the horizontal trace of the straight line is* oxy $(z=0)$ the point of intersection with the plane $M_0^1(70;48{,}75;0)$, and the frontal trace is oxz $(y=0)$ the point of intersection $M_0^2(14{,}28;0;55{,}71)$ with the plane.

In the second problem In the first method, CD *horizontal trace of a straight line, horizontal trace* $N(x=86{,}67;\ y=-45; z=0)$, frontal trace $M(x=36{,}67;\ y=0; z=30)$. In the second method, AB *horizontal trace of a straight line,* oxy $(z=0)$ if there is a point of intersection with the plane $M_0^1(86{,}66;-45;0)$, frontal trace oxz $(y=0)$ is the point of intersection $M_0^2(36{,}66;0;52)$ with the plane.

Drawing geometry is a branch of mathematics that studies the methods of making geometric shapes and solving problems using drawings on a plane. This section of mathematics is an important component of education received at a higher educational institution.

The organization of integrated education with the science of higher mathematics in the teaching of drawing geometry at a higher educational institution helps to better understand the basic concepts and principles of drawing geometry, as well as to develop the skills of using the theoretical concepts of the science of

"Higher Mathematics" in the development of problem-solving skills using plane drawings.

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GIL`BERT FAZOSINING ASOSIY XOSSALARI VA UNING TURLI MASALALARGA TADBIQI

Annotatsiya: *Ushbu maqolada funksional analizning muhim bo‘limlaridan biri bo‘lgan Gilbert fazosining nazariy asoslari va uning amaliy tadbiqlari keng yoritilgan. Xususan, normalar ekvivalentligi tushunchasi, unga oid ta’rif va teoremalar, hamda bu holatlarning fazoviy strukturaga ta’siri tahlil qilinadi. Chiziqli normalangan fazodagi qism fazolar haqidagi xususiyatlar, ularning yopiq va cheklangan to‘plamlar bilan bog‘liqligi ko‘rib chiqiladi. Maqolada skalyar ko‘paytmali fazolar tushunchasi, ular asosida qurilgan fazoviy strukturalar va ularning xossalari o‘rganiladi. Shuningdek, abstract (abstrakt) Gilbert fazolari, ya’ni cheksiz o‘lchamli skalyar ko‘paytmali to‘liq fazolar ta’rifi, ularning mavjudligi va amaliy ahamiyati nazariy va misollar orqali yoritiladi. Har bir asosiy tushuncha ta’riflar, muhim teoremalar va ularni tasdiqlovchi misollar bilan boyitilgan bo‘lib, mavzuning chuqur o‘zlashtirilishini ta’minlaydi.*

Kalit so‘zlar: *Gilbert fazosi, normaning ekvivalentligi, chiziqli fazo, skalyar ko‘paytma, qism fazo, abstrakt Gilbert fazosi, funksional analiz, teorema, amaliy tadbiq.*

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MAIN PROPERTIES OF HILBERT SPACES AND THEIR APPLICATIONS TO VARIOUS PROBLEMS

Abstract: *This article explores the fundamental concepts of Hilbert spaces, which form a core part of functional analysis, along with their theoretical foundations and practical applications. In particular, it examines the concept of norm equivalence, relevant definitions and theorems, and the implications of such equivalence on the structure of normed spaces. The properties of subspaces within linear normed spaces are discussed, including aspects related to closure and*

boundedness. The study also covers inner product spaces and the structures derived from them, emphasizing their analytical and geometric significance. Furthermore, abstract Hilbert spaces—defined as complete inner product spaces, often infinite-dimensional—are introduced and analyzed. Each central concept is supported by clear definitions, key theorems, and illustrative examples, ensuring a thorough understanding of the topic and its practical relevance.

Keywords: *Hilbert space, norm equivalence, linear space, inner product, subspace, abstract Hilbert space, functional analysis, theorem, practical application.*

Gilbert fazosi - chiziqli algebra va funksional analiz sohasida muhim ahamiyatga ega bo‘lgan matematik tushuncha. Gilbert fazosi, Evklid fazosining umumlashgan ko‘rinishi bo‘lib, cheksiz o‘lchovli fazolar uchun ko‘p qo‘llaniladi.

Gilbert fazosining asosiy xususiyatlari quyidagilardan iborat:

➢ Cheksiz o‘lchovli vektor fazosi. Gilbert fazosi, cheksiz sondagi vektorlar yig'indisidan iborat bo‘lgan fazodir.

➢ Ichki ko‘paytirish operatori. Gilbert fazosida vektorlar orasida ichki ko‘paytirish operatori aniqlanadi. Bu operator vektorlar orasidagi "masofa" tushunchasini ta'minlaydi.

➢ Metrika. Gilbert fazosida vektorlar orasidagi masofani belgilovchi metrika mavjud. Bu metrika vektorlar orasidagi "masofa" ni aniqlaydi.

➢ Gilbert fazosi va uning xususiyatlari turli sohalarda muhim ahamiyatga ega:

➢ Kvant mexanikasi. Gilbert fazosi, kvant mexanikadagi "holat fazosi" tushunchasini modellashtirish uchun keng qo‘llaniladi.

➢ Operator nazariyasi. Gilbert fazosi, cheksiz o‘lchovli operatorlar nazariyasi uchun asos bo‘lib xizmat qiladi.

➢ Funktsional analiz. Gilbert fazosi, funktsional analiz nazariyasida keng q`o‘llaniladi. Jumladan, integrallar, differensial tenlamalar, cheksiz o‘lchovli yig'indilar kabi murakkab matematik tushunchalar Gilbert fazosi orqali o‘rganiladi.

➢ Signallar nazariyasi. Gilbert fazosi, signallar nazariyasi, sonli qayta ishlov berish va aloqa nazariyasi kabi sohalarda qo‘llaniladi.

Chiziqli normalangan fazolar metrik fazo bo‘lganligi uchun bunday fazolar uchun metrik fazolar uchun kiritilgan barcha tushunchalar, teoremalar o‘rinli bo‘ladi.

Ta`rif−1. E chiziqli fazo bo‘lib, unda ikkita usul bilan norma kiritilgan bo‘ladi: $\|x\|^{(1)}$, $\|x\|^{(2)}$. Agar shunday bir $\beta > 0$ son mavjud bo‘lib, ixtiyoriy $x \in E$ element uchun $\|x\|^{(2)} \leq \beta\|x\|^{(1)}$

Tenglik o‘rinli bo‘lsa, u holda $\|x\|^{(2)}$ norma $\|x\|^{(1)}$ normaga bo‘ysundirilgan deb aytiladi.Agar E chiziqli fazoda $\|x\|^{(2)}$ norma $\|x\|^{(1)}$ normaga bo‘ysundirilgan bo‘lsa, u holda $\{x_n\} \subset E$ ketma-ketlikning x nuqtaga $\|x\|^{(1)}$ norma bo‘yicha yaqinlashishidan uning $\|x\|^{(2)}$ norm abo‘yicha yaqinlashishi (shu x nuqtaga) kelib chiqadi.

Ta`rif−1. E chiziqli fazo bo‘lib, unda ikki xil usul bilan norma kiritilgan bo‘lsin: $\|x\|^{(1)}$, $\|x\|^{(2)}$. Agar shunday bir $\alpha > 0$, $\beta > 0$ sonlar mavjud bo‘lib, ixtiyoriy $x \in E$ element uchun $\alpha\|x\|^{(1)} \leq \|x\|^{(2)} \leq \beta\|x\|^{(1)}$

Tengsizlik o‘rinli bo‘lsa u holda $\|x\|^{(1)}$ va $\|x\|^{(2)}$ normalar ekvivalent deb aytiladi.

Teorema−1. Ixtiyoriy haqiqiy (kompleks) chekli n o‘lchovli chiziqli fazodagi barcha normalar ekvivalentdir.

E chiziqli fazo (normalangan) va undagi bo‘sh bo‘lmagan L to‘plam berilgan bo‘lsin.

Ta`rif−2. Agar E chiziqli normalangan fazodagi L to‘plam yopiq chiziqli ko‘pxillikdan iborat bo‘lsa, u holda L to‘plam E chiziqli normalangan fazodagi qism fazo deyiladi.

Masalan, agar $C_{[a,b]}$ fazodagi barcha darajasi n dan oshmaydigan ko‘phadlar to‘plamini qarasak, u holda bu to‘plam $C_{[a,b]}$ dagi qism fazo bo‘ladi.Endi Gil`bert fazosi tushunchasini kiritamiz.

**Ta`rif−3**. H orqali kompleks vektor ( chiziqli ) fazoni belgilaylik. Agar H fazoning har bir x, y elementlari juftligiga quyidagi shartlarni (aksiomalarni) qanoatlantiruvchi elementlar skalyar ko‘paytmasi deb ataluvchi (x,y) kompleks son mos qo‘yilgan bo‘lsa, ya`ni:

1) $\overline{(y,x)} = (x,y)$;

2) $(\lambda x_1 + \mu x_2, y) = \lambda(x_1, y) + \mu(x_2, y)$;

3) $(x,x) \geq 0$, $(x,x) = 0$ faqat va faqat x=0 bo‘lsa, u holda H ni skalyar ko‘paytmali fazo deymiz.Ta`rif−3. Dan ko‘rinadiki

a) $(x, \lambda y_1 + \mu y_2) = \bar{\lambda}(x, y_1) + \bar{\mu}(x, y_2)$

b) (x,0)=0=(0,y) kelib chiqadi. Xuddi shunday Koshi-Bunyakovskiy tengsizligi deb ataluvchi $|(x,y)|^2 \leq (x,x) \cdot (y,y)$ tengsizlik ham kelib chiqadi.

Agar skalyar ko‘paytma kiritilgan H fazoda $\|x\| = \sqrt{(x,x)}$ $(x \in H)$ deb olsak, H normalangan fazoga aylanadi. Haqiqatan ham norma aksiomalaridan 1^0 va 2^0 lari bajarilishi ko‘rinib turibdi. 3^0 −uchburchak aksiomasining bajarilishini ko‘rsatamiz. $x, y \in H$ bo‘lsin, u holda Koshi-Bunyakovskiy tengsizligidan foydalanib $\|x+y\|^2 = (x+y, x+y) = (x,x) + (x,y) + (y,x) + (y,y) \leq \|x\|^2 + 2\|x\|\|y\| + \|y\|^2 = [\|x\| + \|y\|]^2$ yoki $\|x+y\| \leq \|x\| + \|y\|$

Ta`rif−4. Agar H fazoda skalyar ko‘paytmali munosabat bilan norma orqali kiritish mumkin bo‘lsa, u holda bu H ni unitary fazo deymiz. Skalyar ko‘paytma kiritilgan H fazo normalangan fazo ham bo‘lgani uchun, normalangan fazo ega bo‘lgan barcha xossalarga H fazo ham ega bo‘ladi. Bundan tashqari

1) Skalyar ko‘paytma uzluksizdir, ya`ni, agar $x_n \to x$, $y_n \to y$ bo‘lsa u holda $(x_n, y_n) \to (x, y)$ bo‘ladi.

2) H fazodan olingan ixtiyoriy ikkita x, y elementlar uchun parallelogram tengligi deb ataluvchi

$$\|x+y\|^2 + \|x-y\|^2 = 2(\|x\|^2 + \|y\|^2) \qquad (1)$$

**Ta`rif−5**. To‘la unitar fazolarni abstract Gil`bert fazolari deymiz. Shunday qilib abstract Gil`bert H fazosi quyidagi talablarni bajaradi;

1. H kompleks chiziqli (vektor) fazo.
2. H skalyar ko‘paytma kiritilgan fazo.
3. $x \in H$ bo‘lsa $\|x\| = \sqrt{(x,x)}$, ya`ni H normalangan fazo.
4. H fazo $\rho(x,y) = \|x-y\|$ metrika ma`nosida to‘la.
5. H fazoda ixtiyoriy $n \in N$ natural son uchun n ta chiziqli erkli elementlar mavjud, ya`ni H fazo cheksiz o‘lchovli bo‘lsin. Gil`bert fazosiga doir eng muhim bo‘lganmisollarni keltiramiz.

1-misol. l_2 kompleks chiziqli fazodagi ixtiyoriy ikkita $x = (x_1, x_{2,\dots\dots,} x_n, \dots)$ va $y = (y_1, y_{2,\dots\dots,} y_n, \dots)$ elementlar uchun $(x,y) = \sum_{n=1}^{\infty} x_n \overline{y_n}$ deb olinsa, bu fazo Gil`bert fazosidan iborat bo‘ladi.

2-misol. $L_2[a,b]$ kompleks chiziqli fazo. Bu fazo $[a,b]$ oraliqda aniqlangan kompleks qiymatli x(t) o‘lchovli funksiyalarning shunday to‘plamiki, bunda $\int_a^b |x(t)|^2 \rho(t)dt < +\infty$ bo‘lsin, bunda $\rho(t)$ haqiqiy qiymatli va $[a,b]$ oraliqning deyarli hamma joyida $\rho(x,y) \geq 0$ bo‘lib to‘liq o‘lchovli to‘plamda $\rho(t) > 0$ bo‘lsin. Agar $x(t), y(t) \in L_2, \rho[a,b]$ funksiyalar uchun $(x,y) = \int_a^b x(t) \cdot \overline{y(t)}\rho(t)dt$ deb olsak, u holda bu fazo Gil`bert fazosidan iborat bo‘ladi.

Xulosa qilib aytganda, Gilbert fazosi - matematik analiz va amaliy fanlar uchun juda muhim bo‘lgan abstrakt matematik tushunchadir. Uning xususiyatlari va Gilbert fazosida qo‘llaniladigan usullar turli murakkab ilmiy va amaliy masalalarni yechishga keng imkoniyatlar yaratadi.

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PROSPECTS FOR THE DEVELOPMENT OF DIGITAL TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE IN THE CONDITIONS OF NEW UZBEKISTAN

Annotation: *This article analyzes the prospects for the development of digital technologies and artificial intelligence (AI) in the context of New Uzbekistan. It highlights the reforms being implemented based on the "Digital Uzbekistan – 2030" strategy, presidential decrees on AI development, and international cooperation programs, including the introduction of AI technologies in sectors such as the economy, public administration, healthcare, agriculture, education, and energy. The article also examines challenges such as the shortage of qualified personnel, financing, and cybersecurity, along with solutions to address them.*

Keywords: *digital transformation, artificial intelligence, Digital Uzbekistan, digital economy, information security, international cooperation, scientific research, cloud technologies, AI in education, digital infrastructure, startups, cybersecurity.*

Within the framework of the New Uzbekistan strategy, digital transformation is regarded not only as a key factor in internal economic and social development but also as a vital platform for positioning the country as an active participant in the global digital economy. According to the World Economic Forum (WEF), "by 2025, more than 30 percent of the global economy will be based on digital technologies" [8]. This trend creates opportunities for Uzbekistan to introduce new business models reliant on artificial intelligence (AI) and big data analytics.

Within the scope of the strategy, the country is implementing large-scale reforms aimed at rapidly advancing digital transformation across economic, social, and administrative sectors. "Digital transformation is not merely a technological change but signifies the renewal of entire business models and the dynamics of social systems" [13]. Adopted in 2020, the "Digital Uzbekistan – 2030" strategy aims to enhance the country's global competitiveness by integrating AI and digital technologies into the economy, public administration, social services, and agriculture.

Furthermore, the strategy seeks to "explore and apply in practice the use of virtual and augmented reality, artificial intelligence, cryptography, machine learning, big data analytics, and cloud computing technologies in economic sectors" [1]. This strategy not only focuses on developing internal capabilities but also aims

to transform Uzbekistan into an active participant in the global digital economy by leveraging international expertise.

The development of digital technologies and artificial intelligence (AI) is one of the priority directions of state policy in the Republic of Uzbekistan. On October 5, 2020, the President approved the "Digital Uzbekistan – 2030" strategy through Decree No. PF-6079, which outlined key objectives such as "developing the digital economy, widely implementing information and communication technologies, and digitizing public services" [1]. Within this strategy, it is planned to "increase the share of electronic public services provided through the Unified Interactive Public Services Portal to 70% by 2025 and 90% by 2030, relative to the public services offered by Public Service Centers" [1]. This simplifies citizens' access to public services and reduces bureaucratic barriers.

On February 17, 2021, Resolution No. PQ-4996, titled "On Measures to Create Conditions for the Rapid Introduction of Artificial Intelligence Technologies," marked a significant step in the AI sector. The resolution outlined tasks such as "implementing AI technologies in economic sectors, social spheres, and public administration systems, organizing scientific research, and developing international cooperation" [2]. The document envisages the creation of financial and institutional support mechanisms for AI projects, as well as the establishment of specialized research institutes. As a result, "in 2022, a Research Center for Artificial Intelligence and Big Data Analytics was established under the Tashkent University of Information Technologies" [9].

Within the framework of international cooperation, "in collaboration with Samsung Electronics, the 'Samsung Innovation Campus' project was implemented to enhance students' practical programming skills in the Internet of Things (IoT), artificial intelligence, mobile programming, and big data at higher education institutions in Uzbekistan" [5]. Additionally, "in 2024, an investment fund worth 50 million USD was established to support startups in AI and digital technologies" [11].

The Resolution No. PQ-358, adopted on October 14, 2024, titled "On Approving the Strategy for the Development of Artificial Intelligence Technologies by 2030," outlined a series of long-term goals for advancing AI technologies. The resolution set specific timelines, including "establishing a 'big data' database by September 1, 2025, and launching computing capacities designed for data processing within AI technology implementation projects by May 1, 2026" [3]. This document demonstrates Uzbekistan's commitment to aligning with global trends in the AI sector and its readiness to invest in infrastructure development. The strategy also sets ambitious targets, such as "increasing the volume of AI-based software products and services to 1.5 billion USD and positioning Uzbekistan among the top 50 countries in the government AI readiness index" [3].

Additionally, the Decree No. PF-60, adopted on January 28, 2022, titled "On the Development Strategy of New Uzbekistan for 2022–2026," placed significant emphasis on digital transformation. It highlighted key initiatives, such as "abolishing the practice of requiring documents confirming specific facts, such as birth certificates, driver's licenses, certificates, and diplomas, through the

introduction of the digital passport project" [4]. Furthermore, the decree stipulated "establishing a practice where no additional documents are required when accessing public services through identification via ID cards" [4]. This decree not only enhances convenience for citizens but also contributes to improving the efficiency of public administration.

According to the Statistics Agency of the Republic of Uzbekistan, "as of January 1, 2024, the number of internet subscribers in Uzbekistan reached 30.1 million," accounting for more than 85% of the population [10]. This figure indicates significant growth compared to previous years and reflects the ongoing development of Uzbekistan's digital infrastructure.

Statistical data shows that "in 2022, Uzbekistan's digital economy accounted for 2.5% of the gross domestic product, with a target to increase this share to 5% by 2025 and 10% by 2030" [6]. The growth of the digital economy is closely tied to the integration of AI technologies across various sectors.

Normative-legal acts are creating a favorable environment for the development of AI technologies while also addressing issues of information security and data privacy. For instance, Resolution No. PQ-5234, adopted in 2021, titled "On Measures to Introduce a Special Regime for the Application of Artificial Intelligence Technologies," established a special regime for AI implementation, which "allows the exemption of certain regulatory requirements during the execution of experimental pilot projects" [12].

Digital technologies and AI play a crucial role in enhancing efficiency and creating new opportunities across various economic sectors. The Presidential Decree "On Approving the Strategy for the Development of Artificial Intelligence Technologies by 2030" aims to broadly implement and develop AI technologies in social and economic sectors to establish the production of new, high-value-added products and services. The priority directions for the implementation of AI technologies, as outlined in the decree, include:

- **Banking and Finance:** Preventing fraud, assessing users' payment capabilities, and forecasting market trends;
- **Tax and Customs:** Reducing the share of the shadow economy, predicting suspicious customs operations, and managing risks;
- **Healthcare:** Diagnosing diseases, determining treatment methods, analyzing medical images, and managing patient data;
- **Agriculture:** Forecasting crop yields, managing agricultural resources, and monitoring the cultivation processes of crops, poultry, fish, and livestock;
- **Energy:** Managing energy resources, optimizing energy production and distribution, developing the use of renewable energy sources, and forecasting demand for them [3].

In Uzbekistan, artificial intelligence technologies are being widely applied not only in banking and finance, tax and customs, healthcare, agriculture, and energy but also in the education sector. The decree places special emphasis on training qualified personnel in AI, strengthening scientific research, and promoting technological knowledge.

The document states that “the development of scientific potential in the AI field will be prioritized, with the creation of educational programs involving foreign experts and scientists, and the training of specialists in line with international standards” [3]. To this end, plans include increasing the number of bachelor’s and master’s programs in AI by 2025 and establishing joint programs with leading foreign universities.

Furthermore, “the introduction of specialized courses and classes on AI and modern digital technologies in educational institutions, as well as the development of professional development programs for educators, has been mandated” [3]. This will provide young people with broad opportunities to master modern technologies.

Another significant aspect is that “specialized AI-focused schools and technoparks will be established, and an education system based on the integration of science and industry will be formed” [3]. This, in turn, will facilitate the convergence of science and practice.

In the future, Uzbekistan has the potential to achieve global competitiveness in the field of artificial intelligence, but challenges remain. The shortage of AI specialists relative to demand, limited funding allocated for sector development, and a lack of cybersecurity personnel are notable issues. For instance, “over 10,000 cyberattacks were recorded in 2024 alone” [7]. Addressing these challenges requires enhancing the education system, increasing research in AI, and strengthening cybersecurity infrastructure.

In conclusion, the development of digital technologies and artificial intelligence in the context of New Uzbekistan opens significant opportunities for rapid modernization in the country’s economic, social, and administrative sectors. The “Digital Uzbekistan – 2030” strategy, legislative reforms, scientific research activities, and international cooperation initiatives are ensuring substantial achievements in this field. Official statistics and research indicate that Uzbekistan has the potential to solidify its position in the global digital economy. However, addressing issues related to information security, training qualified personnel, securing financial resources, and enhancing international competitiveness is critical for future success. By further strengthening collaboration between state policies and the private sector, Uzbekistan has the opportunity to become one of the leading countries in artificial intelligence and digital technologies.

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ФИЛОСОФСКИЙ АНАЛИЗ МЕТАЭТИЧЕСКОЙ ПАРАДИГМЫ

Аннотация: *Метаэтическая парадигма - это область философии, изучающая природу морали, а не конкретные моральные правила или принципы. Она рассматривает такие вопросы, как происхождение моральных суждений, их значение, истинность и возможность обоснования. В статье описывается сущность понятия метаэтики, проблемы, изучаемые метаэтикой, а также специфические особенности метаэтики.*

Ключевые слова: *теория, парадигма, этика, метапарадигма, натурализм, когнитивный, философии, мировоззрения, человеческой деятельности, практическая этика, философия, моральные термины, моральные теории, метаэтические теории.*

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PHILOSOPHICAL ANALYSIS OF THE METAETHICAL PARADIGM

Abstract: *The metaethical paradigm is a field of philosophy that studies the nature of morality, rather than specific moral rules or principles. It considers such issues as the origin of moral judgments, their meaning, truth, and the possibility of justification. The article describes the essence of the concept of metaethics, the problems studied by metaethics, as well as the specific features of metaethics.*

Keywords: *theory, paradigm, ethics, metaparadigm, naturalism, cognitive, philosophy, worldview, human activity, practical ethics, philosophy, moral terms, moral theories, metaethical theories.*

Введение

Люди часто обращаются к этике, когда хотят понять, что правильно, а что неправильно. Существует множество этических теорий, которые предлагают различные стратегии для определения того, является ли действие моральным. Часто люди, основываясь на разных теориях, выносят разные суждения об одном и том же действии. Например, некоторые теории говорят, что аборт морально оправдан, а другие говорят, что он неприемлем.

Оказывается, очень сложно сказать что-либо определенное о природе наших моральных суждений. Метаэтика занимается этой проблемой.

Сегодня метаэтика остается процветающей отраслью моральной философии, и современные метаэтики часто применяют междисциплинарный подход к изучению моральных ценностей, взаимодействуя с такими разнообразными дисциплинами, как социальная психология, культурная антропология, сравнительная политология, а также с другими областями философии, такими как эпистемология, метафизика и другими областями философии, такими как теория действия и философия науки.

Анализ литературы и методология

Идеи метапарадигм высказываются разными учёными в разных дисциплинах. Хотя само слово «метаэтика» появилось в начале XX века, основная философская проблема статуса и оснований морального языка, свойств и суждений восходит к самым ранним периодам философии.

Первой метаэтической работой принято считать «Принципы этики» (1903) Дж.Э.Мура, видевшего свою задачу не в попытке дать определённый ответ на традиционные этические вопросы (что такое добро, в чём состоит долг и тому подобные), а в прояснении самих этих вопросов и имеющихся ответов [5]. Такой подход позволил ему обнаружить свойственную всей прежней этике логическую ошибку в определениях добра, названную им «натуралистической ошибкой». В этом плане книга Дж.Мура “Принципы этики” является источником современного понимания метаэтики. Особый интерес для тех, кто занимается изучением проблем этики и морали, будет иметь попытка Дж.Мура решить кардинальные проблемы этики, дать определения предмета этики, понятий добра, долга, правильного, идеала. Однако аналитическая метаэтика в ее современной форме, как правило, берет свое начало с моральных трудов Джордж Эдвард Мур.

В 1970-х годах, во многом вдохновленная работами таких философов, как Джон Роулз и Питер Сингер, аналитическая моральная философия начала переориентироваться на вопросы прикладной этики и нормативных теорий. Сегодня метаэтика остается процветающей ветвью моральной философии, и современные метаэтики часто принимают междисциплинарный подход к изучению моральных ценностей, опираясь на такие разнообразные дисциплины, как социальная психология, культурная антропология, сравнительная политология, а также другие области внутри самой философии, такие как метафизика, эпистемология, теория действия и философия науки.

Часто ее так и определяют: «Метаэтика есть попытка понять метафизические, эпистемологические, семантические и психологические допущения и убеждения, стоящие за моральными мыслями, словами и практиками» [9].

В статье А.Ф. Васильева кратко описывается проблемное поле метаэтики. Оно включает в себя язык метафизики, психологии, эпистемологии и этики [1]. Главный метафизический вопрос — существование истинной (а не только социально принятой) морали.

В научных исследованиях Л.В. Максимова [4] и Е.А. Кононова [2] анализируется сущность понятия метаэтики и проблемы современной метаэтики.

А.Е.Уфимцев, М.М.Смирнова в своих научных работах анализируются сущностные характеристики системно-структурной и биоэссенциально-детерминистической метапарадигм, различных ракурсов рассмотрены истоки мета-парадигм [6].

Результат и обсуждение

Метаэтика — теоретически ориентированная отрасль изучения морального знания, возникшая в начале XX века в соответствии с аналитическими традициями западной (преимущественно англоязычной) моральной философии. Метаэтика также считается специализированной областью аналитической философии.

Метаэтика (аналитическая этика) — область изучения, объектом которой является нормативная этика. Метаэтика осуществляет логико-лингвистический анализ нормативно-моральных, моральных рассуждений, их непротиворечивости, обоснованности, терминологической корректности и т. д. [7].

Сам термин «метаэтика» имеет явно научное происхождение, он вошел в научный оборот вместе с метаматематикой и металогикой, поэтому его использование оправдано, строго говоря, только в случае признания этики научной теорией. Однако, независимо от того, соответствует ли этика критериям научности (по этому вопросу существуют разные мнения), она, несомненно, содержит в себе понятия, рассуждения, аргументы, понимания, которые могут быть подвергнуты логико-лингвистическому анализу, отчего и появилось слово «метаэтика».

Постепенно в сферу внимания метаэтики вошли и другие методологические вопросы: предмет морали, ее структура, функции, а также ее структура и механизмы, обусловленные традиционной неразличимостью морали и этики или конвергенцией морального сознания в целом (включая его психологические компоненты). Со временем метаэтика, вслед за соответствующим изменением мировоззрения в аналитической философии, отказалась от прежней резко «антиметафизической» ориентации и часто вводила концептуальный анализ непосредственно в метафизический контекст. В целом все изменения философской и аналитической мысли XX века нашли отражение в метаэтике, поэтому ее часто некорректно (особенно в русской литературе) отождествлять только с неопозитивистской школой.

«Метаэтика — это попытка понять метафизические, эпистемологические, семантические и психологические предположения и убеждения, стоящие за моральными мыслями, словами и практиками» [11].

Чем же тогда метаэтика отличается от этики в целом и чем она не занимается? Ответ прост: метаэтика не задает нормативных вопросов, не выносит суждений о природе моральных проблем. Ее не интересует, что следует делать. Обычно ее волнует, что «правильно», где искать эту

правильность, откуда мы об этом знаем и почему она нас волнует. Это уже не нормативная дисциплина, а описательная. Этику часто делят на три части.

Практическая этика занимается конкретными нормативными этическими проблемами в различных областях человеческой деятельности: должен ли человек, живущий в богатой стране, отдавать часть своей зарплаты человеку, живущему в бедной стране? Допустима ли добровольная эвтаназия? Нормативная этика задает более общие нормативные этические вопросы: как отличить правильное действие от неправильного? Когда цель оправдывает средства? Метаэтика задает вопросы об этих вопросах. Ее интересуют моральные термины и моральные суждения как таковые, а также моральная реальность, которая дает им жизнь. Поэтому на самом общем уровне метаэтику можно определить как этику второго порядка, уподобив ее метаматематике, которая занимается математическими вопросами второго порядка (не «сколько будет два плюс три», а «что такое число?» «существуют ли числа?») [8].

В метаэтических исследованиях пересекаются две линии анализа: одна направлена на разработку некоего «стандартного» образа морали, на прояснение критериев и возможностей правильного, демонстративного морального рассуждения; другая — на критику реальных моральных структур (конкретных доктрин, концепций, аргументов) [3].

Моральные исследования начала и середины XX века связаны с метаэтикой. Первым исследованием в области метаэтики является работа Дж.Э.Мура «Принципы этики». Он видел свою задачу не в попытках дать точные ответы на традиционные моральные вопросы (что такое добро, что такое долг и т. п.), а в прояснении самих этих вопросов и существующих на них ответов. Такой подход позволил ему обнаружить логическую ошибку в определениях добра, свойственную всем прежним моральным ценностям, которую он назвал «естественным заблуждением».

Если основной темой аналитической философии (особенно в ее неопозитивистской фазе) является вопрос о соотношении науки и метафизики как альтернативных форм знания, то в метаэтике на первый план выходит проблема знания и ценностей. Эта проблема имеет два относительно самостоятельных аспекта: может ли общее знание (в частности, знание о ценностях — моральных и других) иметь нейтральную ценность; каков когнитивный статус моральных (и оценочных суждений вообще), являются ли они «знаниями», которые необходимо проверять на истинность и ложность?

Обсуждение первого аспекта было оторвано от социально-практических вопросов и почти всегда приводило к выводам в пользу признания ценностной нейтральности метаэтического анализа.

Метаэтика интересуют сами моральные термины и моральные теории, а также моральная реальность, которая, по-видимому, дается им в жизни. Поэтому, на самом общем уровне, метаэтику мойно определить, как этику второго ряда, по аналогии с метаматематикой, которая занимается

математическими вопросами второго ряда (не "сколько будет два плюс три", а "что такое число?" и "существуют" ли число?") [8].

Метаэтика поднимает вопрос о статусе морали. Являются ли наши теории добра и зла теориями объективных состояний или это просто человеческие конструкции? Имеют ли наши моральные суждения объективный источник? Если да, то какова их природа? Можем ли мы знать, что морально хорошо и что морально плохо? Если да, то как люди приобретают это знание? Если нет, то как возможны моральные обязательства?

Обширные метаэтические теории стремятся дать последовательные ответы на такие вопросы. Они также рассматривают основные подходы к решению метаэтических проблем, анализируют доказательства в их пользу и указывают на трудности, с которыми сталкивается каждая позиция.

Что изучает метаэтика?

Согласно Ричарду Гарнеру и Бернарду Розенге [10, 215], существует три типа метаэтических проблем или три общих вопроса метаэтики: Каково значение моральных понятий и суждений? Каковы характеристики моральных суждений? Как моральные суждения могут быть оправданы?

Первый тип вопросов, например, заключается в том, что подразумевается под понятиями «хорошо», «плохо», «правильно», «неправильно». Второй тип включает вопросы о том, являются ли моральные соображения универсальными или относительными, однозначными или плюралистичными. Третий тип вопросов, например, заключается в том, как мы узнаем, что хорошо, а что плохо, и возможно ли это вообще узнать. Гарнер и Розен подчеркивают, что все три типа вопросов не являются независимыми, и ответ на один из них подразумевает более точные ответы на другие [10].

Большинство исследователей (включая Дж. Э. Мура) не сомневались в когнитивной природе этики и видели задачу логико-лингвистического анализа в том, чтобы помочь трансформировать нормативную этику в более строгую (возможно, дедуктивную) науку путем формализации ее языка и структуры. Хотя эта программа не была реализована каким-либо последовательным образом, когнитивизм (т.е. интерпретация этики как «знания») продолжает доминировать в метаэтике в двух формах: натурализм (Р. Бойд, Н. Стерджен и др.) и интуиционизм (Дж. Э. Мур, У. Росс и др.).

Натурализм (как метаэтическая концепция) — трактовка моральных слов и суждений как описательных единиц языка, объективное значение которых состоит из определенных «естественных» реальностей (интересов человека, социальных и природных отношений и закономерностей и т. п.). Согласно интуитивизму, моральные понятия соответствуют определенным «неестественным» объектам (хорошим вещам и т. п.), которые недоступны обыденному познанию и постигаются только с помощью чувств.

Метаэтика, в отличие от традиционной философской этики, осознает себя научной философией морали или теоретической этикой, которую, во избежание терминологической путаницы, аналитики называют нормативной

этикой. Взгляды метаэтиков различались в решении вопроса о когнитивном статусе моральных суждений.

Метаэтика осуществляет логико-лингвистический анализ нормативно-этических, моральных рассуждений на предмет их состоятельности, обоснованности, терминологической точности и т. д.

Методологической основой метаэтических исследований является перевод моральных проблем в языковую сферу и последующий анализ соответствующих языковых выражений в терминах логических правил с целью адекватной формулировки этих проблем и устранения псевдопроблем, возникающих из-за неправильного употребления слов и нарушения правил словоупотребления.

Метаэтика не выполняет функцию судьи в моральных спорах и не участвует в формировании ценностных позиций. Она выполняет функцию упорядочивания, систематизации, внесения логической дисциплины в моральные споры, устранения «излишней сложности» моральных вопросов, которая связана не со сложностью самого предмета морали, а с неопределенностью и неоднозначностью его понятий [3].

Можно сказать, что цель метаэтики — создать нормативную теорию, которая говорит нам, что хорошо, что морально правильно и т. д. Согласно общепринятой классификации, метаэтика — один из трех типов этики, два других — нормативная и практическая этика. Метаэтика изучает метафизические, эпистемологические и семантические свойства моральных идей. Она задает такие вопросы, как «Являются ли моральные утверждения объективными или субъективными, относительными или абсолютными?», «Существуют ли моральные факты?», «Как мы усваиваем моральные ценности?».

Заключение

Метаэтика — это раздел аналитической философии, который изучает природу морали, не конкретные моральные нормы или правила, а природу морали, стремится понять сущность моральных суждений и изучает статус, основания и сферу моральных ценностей, атрибутов и слов. Она отвечает не на вопросы о том, как следует действовать, а на вопросы о природе моральных суждений, их значении и обосновании. В то время как области прикладной этики и нормативной теории фокусируются на том, что такое мораль, метаэтика фокусируется на том, что такое сама мораль. Важность метаэтики сегодня можно понять из ее природы как способа определения морали и изучения неморальных предположений, которые делают люди, когда пытаются вести себя морально. Короче говоря, метаэтика задает неморальные вопросы о самой морали. Эти вопросы бывают разных форм.

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ЖАМИЯТДА МАЪНАВИЙ ҚАДРИЯТЛАРНИНГ ШАКЛЛАНИШИ ВА РИВОЖЛАНИШИ

Аннотация: *Ушбу мақолада, бутун жамият учун миллий маънавият ва маърифат соҳасини янада ривожлантириш борасида алоҳида эътиборни тортадиган баъзи долзарб муаммо ва масалалар ҳам сақланиб қолаётганлиги таҳлил қилинган. Шунингдек мақолада уларнинг самарали ечимларини топиш жорий йилдаги фаолиятда ниҳоятда муҳим аҳамият касб этиши зарурлиги очиб берилган.*

Калит сўзлар: *жамият, таълим, тарбия, миллий маънавият, тараққиёт, Янги Ўзбекистон, баркамол авлод, маънавий қадриятлар, инсон камолоти.*

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FORMATION AND DEVELOPMENT OF MORAL VALUES IN SOCIETY

Abstract: *The article analyzes the fact that there are some urgent problems and issues that require special attention for the further development of the sphere of national spirituality and education of the whole society. The article also reveals that the search for effective solutions for them will be of paramount importance in the activities of the current year.*

Keywords: *society, education, upbringing, national spirituality, development, New Uzbekistan, mature generation, spiritual values, human perfection.*

Ижтимоий фалсафа учун ҳамма замонларда ҳам жамиятнинг умумий ривожига, даврнинг аниқ воқеа-ҳодисаларига, аҳоли қатламлари, ижтимоий гуруҳларнинг қандай муносабатда бўлаётгани, маънавий-маърифий ишлар самараси муҳим аҳамиятга эга. Шу асосда жамият тараққиёти, унинг маънавий макони ўрганилади ва таҳлил этилади. Бу жиҳатдан, жамиятнинг маънавий тараққиёти масаласи ҳам замонавий фалсафий фанларнинг муҳим тадқиқот йуналиши ҳисобланади.

Бу мавзунинг Ўзбекистоннинг ижтимоий ва иқтисодий тараққиёти билан боғлиқ масалалари Президент Шавкат Мирзиёевнинг асарларида, нутқ ва маърузаларида бугунги жамият ривожининг устувор вазифалари сифатида асослаб берилмоқда. Олий мажлис палаталарининг қўшма мажлисидаги нутқида “Бизнинг энг катта бойлигимиз - бу халқимизнинг улкан интеллектуал ва маънавий салоҳиятидир”[3], деб таъкидлагани асло бежиз эмас[4]. Ҳозирги даврда амалга оширилаётган 2022-2026 йилларга мўлжалланган Янги Ўзбекистон тараққиёт стратегияси жамият ҳаётининг сиёсий, иқтисодий, маданий, маънавий жабҳаларида туб тарихий бурилиш билан боғлиқ бир қатор муаммоларни ва вазифаларни ҳал этиш масаласини қўймоқда. Ана шундай улкан вазифа ва масъулият халқимиздан бир томондан, маънавий юксалишни, иккинчи томондан эса, фуқаролик жамияти қуришда унга таянишни тақозо қилмоқда. Албатта бу тараққиёт йўлини амалга ошириш, яъни, фуқаролик жамиятини барпо этишнинг асосий омилларидан бири - халқимиз маънавиятини ривожлантириш, юксалтиришдир.

Жамиятда юксак маънавий фазилатларни камол топтириш, миллий мафкурани шакллантириш, ёшларни бой маданий меросимиз, тарихий анъаналаримизга, умуминсоний қадриятларга ҳурмат, Ватанга муҳаббат, истиқлол ғояларига садоқат руҳида тарбиялаш мамлакатимизда амалга оширилаётган барча ислоҳотларнинг ҳал қилувчи омилидир. Инсонлар ўзлигини чуқур англаши, мустақилликнинг қадрини тобора теран тушуниши, миллий тафаккурнинг кенгайиши ва такомиллашуви, тарихий ҳурлик, мустақиллик руҳининг уйғонишини таъминлаш маънавият соҳасидаги сиёсатимизнинг асосий мақсадига айланди.

Мамлакатимизда ривожланган фуқаролик жамиятини барпо этиш мақсад этиб белгиланган бир пайтда, демократик тамойилларни эгаллаш, фуқаролар ижтимоий-сиёсий фаоллигини ошириш, шахс эркинлигини амалда жорий этиш, сиёсий жараёнларни эркинлаштириш, демократик меъёрлар асосида кўппартиявийлик тизимини такомиллаштириш, давлат бошқаруви органларининг айрим ваколатларини босқичма-босқич жамоат ва ўзини ўзи бошқариш органларига бериш каби вазифалар умуминсоний ва миллий қадриятларни ўзида ифода этган ҳолда маънавият билан туташади. Жамиятдаги демократик ўзгаришларни амалга ошириш учун маънавият сиёсатнинг бош таянчи бўлмоғи керак.

Ўзбекистон мустақиллигининг 35 йили мобайнида биз бу борада улкан ютуқларни қўлга киритдик. Мамлакатимиз эски тоталитар тузум иллатларидан қутулиб, янги муносабатларга асосланган тузумга ўтди. Шунга мувофиқ равишда ижтимоий муносабатлар ўзгармоқда, фуқаролик жамияти вужудга келмоқда. Ўз-ўзидан маълумки, бу мураккаб жараён. Чунки, ислоҳотлар мустақилликни мустаҳкамлаш, халқнинг онгини аста-секин янги замонга қараб ўзгартириш негизида давом этмоқда. Одамлар онги, тафаккури эса тез ўзгарадиган ҳодиса эмас. Миллий ўзликни англаш, миллий ҳамжиҳатлик, маънавий қадриятларни тиклаш соҳасида кўп ишлар амалга

оширилди. Айтиш мумкинки, Ватанимиз қиёфаси ана шу муддат ичида тубдан ўзгарди. Тарихимиз тикланди, улуғ аждодларимиз номлари оқланиб, улар меросини ўрганиш кенг миқёсда давом этмоқда. Ислом дини иймон-эътиқодимиз сифатида қайта тикланди, ўзбек тили давлат мақомини олди. Шулар замирида юртдошларимиз қалбида ўз ўтмиши, буюк ватани билан фахрланиш туйғуси шаклланмоқда. Ўзбек фарзандлари бугун бошини баланд кўтариб, дунё бўйлаб ўзини намоён этмоқда. Миллий ғурур, ватанпарварлик туйғуси ватан тараққиёти, юрт тинчлиги ва халқ фаровонлиги учун кураш туйғуси билан уйғунлашиб, маънавиятимиз асосини белгиламоқда.

Фуқаролик жамиятини барпо этиш маънавий етук инсонларни тарбиялаш, таълим ва тарбия тизимини тубдан ислоҳ қилишга ҳам боғлиқ. Чунки, айни билимлилик ва юқори маънавиятлиликдан ҳамманинг бахт-саодати йўлида фойдаланиш мумкин. Аслини олганда етук инсонларни ақлий фаолиятлари, тафаккури жаҳон фани ва маънавиятининг энг яхши ютуқларини ўзига сингдириб олган баркамол авлодни тарбиялаш, камол топтириш давр талабидир. Жамиятда маънавиятни ривожлантириш ва юксалтиришда бевосита ва билвосита таъсир кўрсатувчи бир неча ижтимоий институтлар ва омиллар мавжуд.

Юксак маънавиятга эга баркамол авлодни тарбиялашда, ҳар бир миллатнинг ўзига хос миллий қадриятларини, маънавиятини шакллантиришда ва юксалтиришда оиланинг ўрни беқиёсдир. Мамлакатимиз Конституциясида оиланинг ижтимоий мақоми аниқ белгилаб қўйилганлиги, шу асосда Оила, Фуқаролик, Уй-жой кодекслари ва бошқа зарур қонун ҳужжатлари қабул қилиниб, бу борада тегишли ҳуқуқий пойдевор яратилганлиги оила институтини жамиятнинг бошқа муҳим ижтимоий тизимлари, юртимиздаги маънавий ўзгаришлар билан уйғун тарзда ривожлантириш, унинг нуфузини ошириш масаласига доимий эътибор бериб”, келинаётганлигидан далолат беради.

Маънавий ҳаётимизни юксалтириш ҳақида гапирганда, маҳалланинг роли ва таъсири хусусида тўхталиш албатта ўринлидир. Дарҳақиқат, дунёнинг бирорта мамлакатида учрамайдиган маҳалла институтига истиқлолнинг дастлабки йиллариданоқ давлатимиз раҳбари ташаббуслари билан катта эътибор қаратилиб, обрўси қайта тикланди, ваколати кенгайиб, ҳаётимизда тутган ўрни юксалди. Ўзбекистон Республикаси Конституциясида маҳалланинг ҳуқуқий мақоми “Фуқароларнинг ўзини ўзи бошқариш органи” сифатида белгилаб қўйилганлиги ҳам ана шундан далолат беради.

Бугунги кунда маҳаллалар мустақил ижтимоий институт сифатида қайтадан мустаҳкамланди ва маҳалла жамиятда маънавий-маърифий қадриятлар, соғлом турмуш-тарзи фалсафасининг қарор топиши, баркамол авлодни тарбиялаш, жойларда таълим, аҳоли бандлиги, атроф-муҳитни муҳофаза қилиш, ободонлаштириш, жамоат хавфсизлиги ва хуқуқ-тартиботни таъминлашга катта ҳисса қўшмоқдалар.

Маънавиятни шакллантиришга бевосита таъсир қиладиган яна бир муҳим ҳаётий омил – бу таълим-тарбия тизими билан чамбарчас боғлиқдир.

Таълим-тарбия ҳақида гап кетганда, Абдулла Авлонийнинг “Тарбия биз учун ё ҳаёт – ё мамот, ё нажот – ё ҳалокат, ё саодат – ё фалокат масаласидир” деган фикрларини эслаш кифоя, деб ўйлаймиз. Ватанимизнинг ёруғ келажагини белгилайдиган, унинг куч-қудратини таъминлайдиган омиллар орасида таълим-тарбия соҳаси алоҳида ўринга эга.

Шунинг учун ҳам баркамол авлодни тарбиялашнинг бош воситаси бўлган таълим тизимини ислоҳ қилиш жараёнида миллий таълим мазмуни ва сифатини замон талабларига кўтариш билан бир қаторда, тараққий топган давлатлардаги ўқув марказларига бориб ўқишларига, профессор-ўқитувчиларнинг хорижда малакаларини оширишларига ҳамда таълим соҳаси билан боғлиқ хорижий маблағ ва грантларни республикага жалб этишига катта эътибор қаратилиб келинмоқда.

Қадриятлар ҳам маънавиятнинг таркибий қисимларидан бирини ташкил этади. Улар ижтимоий хусусиятга эга бўлиб, кишиларнинг амалий фаолияти жараёнида шаклланади ва ривожланиб боради. Қадриятлар кишиларнинг турли соҳалардаги, аввало, ишлаб чиқариши, меҳнат соҳасидаги фаолияти учун фойда келтирадиган нарса ва ҳодисалар мажмуи билан боғлиқ ҳолда юзага келади. Табиат ва жамият ҳодисалари инсоннинг моддий ва маънавий бойликлар ишлаб чиқариш, яратувчанлик фаолияти туфайли, унинг эҳтиёжларини қондириш натижасида қадриятлилик аҳамиятига эга бўлади. Одамларнинг манфаатлари, эҳтиёжларини қондира олмаган, уларнинг орзу-истаклари, интилишларига мос келмайдиган, табиат ва жамият ҳодисаларини қадриятлар сирасига киритиш ноўриндир.

Қадрият дейилганда, инсон ва инсоният учун аҳамиятли бўлган, миллат, элат ва ижтимоий гуруҳларнинг манфаатлари ва мақсадларига хизмат қиладиган ва шу туфайли улар томонидан баҳоланиб қадрланадиган табиат ва жамият неъматларини, ҳодисалари мажмуини тушунмоғимиз лозим[6]. Табиат ва жамият бойликлари, ҳодисаларини қадриятлар сирасига киритилишнинг асосий сабаби-кишилар уларни қадрлайдилар, авайлаб-асрайдилар, чунки, бу қадриятлар уларнинг шахсий ва ижтимоий турмушини, маънавий – руҳий дунёсини бойитади, яратувчанлик фаолиятига йўллайди.

Маънавий қадриятлар ва уларнинг инсон камолотидаги аҳамиятига тўхташдан аввал, қадриятларнинг турлари ва кўринишларини билиб олиш лозим. Қадриятлар ўз моҳияти, хусусиятлари ва амал қилиш доирасига кўра бир неча турларига ва шаклий кўринишларга бўлинади. Аввало, барча қадриятлар орасида инсон ва унинг ҳаёти энг олий қадрият ҳисобланади. Инсон йўқ жойда бирон нарсанинг қадр-қиммати, аҳамияти ҳақида сўзлаш бемаъниликдир. Инсонсиз борликдаги мавжуд барча нарса ва ҳодисалар ўзининг қадриятлилик аҳамиятини йўқотади. Шунинг учун ҳам мустақилликнинг дастлабки йиллариданоқ инсон қадр–қимматини эъзозлаш, унинг манфаатларини ҳар томонлама ҳимоя қилиш, турмушини яхшилаш, билими ва маданий савиясини ривожлантириш, соғлиғини сақлаш, ҳаётини ҳимоя қилиш давлатимиз сиёсатининг асосий йўналишини ташкил этиб келмоқда. Жаҳонда эътироф этилган тараққиётнинг «ўзбек модели»нинг

асосий тамойилларидан бири ҳам бозор иқтисодиётига ўтишда аҳолининг ижтимоий ҳимоясига қаратилганлигида чуқур инсонпарварлик моҳияти мавжуддир.

Инсоннинг яшаши учун зарур бўлган барча табиий бойликлар –ер, сув, ҳаво, қуёш, турли маданлар, ўсимликлар, ҳайвонат дунёси ва бошқалар, шунингдек, инсон меҳнати, ҳатти – ҳаракати, ақл-заковати билан яратилган турли-туман моддий бойликлар, завод ва фабрикалар, ишлаб чиқариш, транспорт воситалари, асбоб-ускуналар, ҳозирги замон ахборат технологиялари, турар жой, мол-мулк, ноз-неъматлар ва бошқалар табиий ва моддий қадриятлар ҳисобланади. Буларсиз инсоният яшай олмайди. Табиат ва унинг бойликлари биз учун моддий неъматларнинг бош манбаи ҳисобланади. Уларни асраб-авайлаш, табиатга эҳтиёткорона муносабатда бўлишга ҳар биримиз маънавий ва амалий жиҳатдан масъулмиз.

Бугунги эзгу ишларнинг ҳаммаси, амалга оширилаётган туб ислоҳотлар ҳам бутун халқимиз, аввало ёшларнинг маънавий тарбиясига, уларнинг қандай ташкил этилгани ҳамда таълим сифатини таъминлаш даражаси билан боғлиқ экани шубҳасиз. Бу жарёнда турли қараш ва фикрга эга бўлган ёшларнинг ўз позициясини эркин ифода этиши ва уни ҳимоя қила олиши жамиятимизда рўй бераётган янгиланишлар ва ўзгаришларнинг негизи бўлиб қолиши кераклигини давр тақозо қилмоқда. Ўз навбатида бу, жамият тараққиётининг улкан ҳаракатлантирувчи омилларидан бирини ташкил қилади ва ҳар бир ёш авлод вакилининг барча имкониятларини умумий ишга сафарбар этишга кенг имкониятлар яратади.

Ўзбекистон Республикаси Президенти Шавкат Мирзиёевнинг Олий Мажлис ва Ўзбекистон халқига 2022 йилнинг 20 декабрдаги Мурожаатномасида бу борада ниҳоятда муҳим бўлган қуйидаги фикр бежизга алоҳида таъкидланмаган: Таълим сифатини ошириш – Янги Ўзбекистон тараққиётининг яккаю ягона тўғри йўлидир. Юсуф Хос Ҳожиб бобомиз айтганларидек: “Заковат бор жойда улуғлик бўлади, Билим бор жойда буюклик бўлади”. Шунинг учун ушбу соҳада бошлаган ислоҳотларимизни давом эттиришимиз, таълим даргоҳларига бориб, ўқитувчи ва мураббийлар билан кўпроқ мулоқот қилиб, ўқув-тарбия ишлари сифатини ошириш бўйича улар қўйган масалаларни биргаликда ҳал этишимиз керак.

Хулоса қилиб айтганда, инсон ҳаётида, айниқса таълим-тарбияда маънавиятга алоқадор бўлмаган жабҳанинг ўзи йўқ. Шундай экан, маънавий омиллар ҳар бир ёш инсонга ўзлигини англаб олишда катта ёрдам беради, одамзотини улуғлаш, унинг мартабасини кўтаришда таянч ва суянч бўлади. Бу жиҳатдан, Янги Ўзбекистоннинг тараққиёт стратегияси ва маънавий янгиланиш сиёсати давлатимиз томонидан жорий йилда ҳам ёшларимизнинг ташаббускорлиги, ижодкорлигини қўллаб-қувватлаш, ҳар бир ўғил-қизимизнинг ўз меҳнат натижаларидан баҳраманд бўлиши, манфаатдорлиги, уларнинг ижтимоий салоҳиятини тўла тўкис рўёбга чиқариш учун зарур бўлган имконият эшигини очиб беради.

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ФОЛЬКЛОР И КРЕАТИВНОЕ МЫШЛЕНИЕ: ДИАЛЕКТИКА ВЗАИМОСВЯЗИ

Аннотация: *В данной статье рассматривается роль фольклорных произведений в развитии творческого мировоззрения личности. В частности, на основе фактологической информации выделены образцы устных народных творчеств как составная часть этнокультуры. Анализируется роль лакайских сказительных школ в пропаганде народного фольклора, также изучается вопросы устного творчества в этнокультурных процессах.*

Ключевые слова*: фольклор, творческое мировоззрение, креативность, этнокультура, лакайцы, культурное наследие, традиции.*

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FOLKLORE AND CREATIVE THINKING: DIALECTICS OF INTERCONNECTION

Abstract: *This article examines the role of folklore works in the development of the creative worldview of the individual. In particular, based on factual information, examples of oral folklore are identified as an integral part of ethnoculture. The role of Lakai fairy-tale schools in the promotion of folklore is analyzed, and issues of oral creativity in ethnocultural processes are also studied.*

Keywords: *folklore, creative worldview, creativity, ethnoculture, Lakai, cultural heritage, traditions.*

Сегодня как никогда важно воспитывать творческое мировоззрение зрелого поколения, пропагандируя примеры духовного наследия, тем самым обогащая историческое мышление людей и информируя их об уникальном культурном и духовном наследии предков. Национальное наследие не возникает в вакууме, а формируется в духовном мире этносов в определенном историческом процессе, в целостной связи пространства и времени, формируется путем суммирования сложившихся духовных и культурных ценностей. Внедрение подобных примеров наследия в сознание членов общества, особенно молодежи, считается важным фактором формирования у них креативности.

Креативность занимает ведущее место в терминологической таблице периода, а также имеет важное значение в реализации передовых идей в

обеспечении развития общественного развития. Также сегодня все большее значение приобретает креативность как механизм создания условий для рождения таких идей, поэтому важно развивать творческое мышление каждого человека, использовать в этом духовные факторы в том числе образцов устных народных творчеств.

Хотя креативность в основном используется в научной и популярной литературе по отношению к примерам науки, творчества и искусства, ее следует использовать по отношению ко всем областям, воплощающим инновационные, т.е. новые идеи. Ведь хотя словосочетание «прогресс» вошло в лексикон человечества в XVIII-конце XIX-х веков как понятие, обозначающее скорость роста экономических процессов, сегодня оно используется во всех сторонах общественной жизни наряду с экономическим прогрессом, как политический, культурный и духовный прогресс, и мы являемся свидетелями его широкого использования. Или словосочетание «творчество», появившееся в начале XX века, сначала стало появляться в общечеловеческом лексиконе для обозначения художественного творчества, т. е. способности создавать литературные произведения, а позднее стало широко использоваться в изобразительном и прикладном искусстве. Сегодня как «творческий подход» он широко используется для выражения качественных сторон творческой деятельности в общественной жизни. Пока это так, понятие «креативность» можно использовать во всех процессах, в которых задействован элемент инновационных идей. Подобные идеи присутствуют во всех областях человеческого мышления.

В действительности совершенствование социокультурных, в том числе литературных отношений, представляет собой явление, требующее творческого подхода, новаторских способностей, направленных на гармонизацию положительных ситуаций в процессе, и практического проявления этих идей.

В 1959 году известный психолог Э. Фромм так объяснил понятие креативности: «Креативность — это способность находить решения в нестандартных ситуациях, опираясь на собственные способности и опыт, воплощая в себе смысл и удивление» [8, с.21]. По мнению американского психолога Э. П. Торренса, креативность является выражением многих мировоззренческих состояний, возникающих в процессе деятельности по выявлению и решению этих проблем под руководством эмоций по отношению к существующим проблемам [7, с.28]. А.Маслов рассматривал креативность как черту, потенциально присутствующую во всех людях от рождения. Способность к творчеству не требует специальных талантов или способностей [3, с.46]. Ведь креативность имеет более широкое значение по сравнению с творчеством и показывает, что в основе любой благородной деятельности и творчества лежит воплощение передовых идей. По мнению другого ученого, Г. Форда, конец 20-го и 21-й век являются периодом креативности, - мы сейчас живем в эпоху информационной экономики или экономических знаний, но есть и другой факт: эта информационная экономика

создает человека креативность [9, с.177]. С этой точки зрения креативность в литературных процессах представляет собой акцент на деятельности наций и народов, которая должна вести к единству и общей цели, когда синтезируются общечеловеческие ценности.

Известно, что литературное творчество – это деятельность по созданию духовных ценностей, а креативность – продукт демократического мировоззрения, призванного обеспечить творческую активность во всех сферах общественной жизни, в которой ведущее место занимает комплекс идеологических факторов. Несмотря на то, что креативность как понятие появилось в лексиконе человечества в последние десятилетия, исторические корни этого процесса уходят в далекое прошлое. Ведь позитивный подход, основанный на приоритете идей, наблюдалось во все эпохи и времена и проявлялся в повседневной деятельности отдельных людей.

Сегодня, когда происходят процессы самосознание и самореализации, фольклор, образцы прикладного искусства, совокупность материальных и духовных богатств конкретного народа, созданная в процессе общественно-исторического развития, являются факторами, определяющими место и положение этнической группы или нации в развитии мировой системы материальных, духовных и культурных ценностей. Эти факторы важны для будущего развития народа или нации и налагают на их представителей, в том числе интеллектуалов, чувство ответственности за свое устойчивое развитие путем сохранения традиционных и современных ценностей. Все культурные общества заинтересованы в развитии цепочки положительных ценностей, которые формируются и имеют тенденцию развиваться внутри этого общества. Так как, ценности, созданные представителями человечества, способные доставить людям материальное, духовное и эстетическое удовольствие, имеют право на уважение как сокровище, относящееся ко всему человечеству.

Помимо сезонных тем, важных для определенного периода в науке, существуют еще темы исследований, которые могут показать свои актуальные аспекты в каждой общественно-исторической ситуации, не теряя при этом своей значимости с течением веков, и которые поистине достойны уважения. В этой связи примечательно, что тема лакайцев, которая являются тюркоязычным народностям и встречается у тюркских народов и основная часть которых входит в состав узбекской нации, не теряла своей актуальности и значения во все общественно-исторические периоды, наоборот, оно проявляло новые аспекты как нераскрытый резерв. Подобные фольклорные образцы как составная часть этнической культуры отражают условия жизни народа, а также его мыслительные способности и духовный потенциал.

Лакайцы мало изучен академическими кругами и имеет богатое фольклорное наследие. Это неисчерпаемое культурное и духовное сокровище, дающее еще больше материала для дальнейших исследователей, хотя опубликованы десятки работ. Важно, что эта этническая группа, воплотившая в себе все аспекты тюркской составляющей, завоевала собственное место и

положение в социально-экономической жизни Центрально-Азиатского региона, а также смогла проявить свое культурно-духовное богатство и щедрость как сокровище научной и исследовательские материалы во всех областях. Пропаганда богатых фольклорных образцов лакайцев служать одним из важных факторов роста творческого мировоззрения каждого человека.

В основе этнокультурного наследия лакайцев лежит устное народное творчество, которое, в свою очередь, состоит из былин, сказок, пословиц, традиционных песен, поговорок и повествований. Все надежды, мечты и вера народа в будущее выражаются в примерах устного творчества. Тем более, что через искусство воспевание (сакичилик), имеющее свои исторические корни этнической культуры и духовности, огромная ответственность народа, повидавшего многое, донести до народа образцы фольклора и направить его на правильный путь.

Несмотря на то, что в духовном наследии народности много сказок, пословиц, анекдотов, традиционных песен и былин, из-за отсутствия в последние годы отношения к национально-духовному наследию, небольшое их количество сохранилось и сегодня. Ни для кого не секрет и никто не может отрицать, что в начале XX века, который мы до недавнего времени считали временем, когда все население было «сплошным неграмотным», если только в лакайских школах сказителей обучалось более сотни саки (воспеватели народных песен), сегодня количество саки (воспеватели народных песен), в населении либо 3-4, либо нет. С этой точки зрения в сегодняшний период, когда наше духовное и культурное наследие переживает кризис, пропаганда многочисленных образцов устного творчества приобретает важное научное значение, а также служит поднятию креативности членов общества.

Как и у окружающих тюркских народов, эпосы и отрывки циклов Алпомиш и Гёроглы занимали доминирующее положение в духовном наследии лакайцев. Ученый-этнограф Б. Х. Кармышева, изучавшая этнокультурную жизнь лакайцев и опубликовавшая ряд научных статей и монографий, говорит, что эпосы циклов Алпомиш и Гёрогли занимают прочное место в духовно-культурном наследии народности, и подчеркивает, что их с благоговением изучают молодое поколения [2, с.14-26]. И естественно, что такое обучение, то есть положительное отношение к примерам устного народного творчества, естественным образом развивает творческое мировоззрение в сознание молодёжи.

Естественно, и сегодня среди населения можно наблюдать примеры народного творчества, хотя и медленнее, чем раньше. Такая положительная ситуация более отчетливо наблюдается среди женщин, чем среди мужчин. Особенно в зимнюю пору, когда прекращаются полевые и приусадебные работы, а долгими зимними ночами девушки и женщины собираются вместе для вышивания, а также приглашаются красноречивых женщин и сказительниц, пение эпосов и песен, и игра на чанкавузе в особых мелодиях и ритмах воспеваются и рассказываются вышеперечисленные образцы устных

народных творчеств. Об этом пишет учёный М. Миркамолова: «Среди женщин до сих пор продолжается традиционное исполнение повестей, сказок и народных песен. Раньше в светлые ночи женщины и девушки собирались в нужном месте деревни, пели песни, рассказывали рассказы, истории и играли на чанковузе и доире.

Тагаева Халима рассказала, что этот обычай сохраняется и сейчас в некоторых населенных пунктах проживания лакайцев» [4, с.13]. Следует также отметить, что в 1961 году изучение устного творчества лакайцев было включено в годовой план Института языка и литературы имени Рудаки Академии наук Таджикской Республики, а в июле-августе этого года исследователи М. Миркамолова и М. Холов провели исследование. Кроме того, в 1963 году Институтом языка и литературы Академии наук Узбекистана была организована научная экспедиция, и фольклорист Тура Мирзаев записал эпос «Поход Авазхана на озеро Гырдоб» у сына Боймана Шамурода, живущего в селе Саргазон Дангары [6].

Среди населения распространено чтение популярных поэтических эпосов в исполнении женщин, особенно в форме повествования. Из эпосов цикла «Алпамиш», «Бойбури и Бойсари», былины цикла «Гёрогли», «Тахир и Зухра», «Гульмирза» и «Ёзи Кал» передавались по кругу без ущерба сути и содержания.

Легенды, рассказы и повествования занимают особое место в устных произведениях народности. Легенды, рассказы и повествовательные жанры, как и героический эпос, заканчиваются битвой добра и зла, победой добра над злом. Встречаются также повести и рассказы комического характера. Среди повествований большое значение в этнофольклоре имеют: Хасан, Ясли для осла Хасана, Аваз, Ёзи Кал, а также повествования, посвященные природным явлениям, рекам, озерам, колодцам, родникам, горам, холмам, плоскогорьям, деревням, городам. Ныне, пропаганда этих аспектов служат развитию креативности народа. Среди повествований принято выкладывать историю семьи, знать семерых дедов, деревню, где он родился и живет, а также основные точки поблизости, этот аспект также служил развитию креативности.

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МОНИТОРИНГ ОСНОВНЫХ ОЗЕРНЫХ СИСТЕМ ДЕЛЬТЕ РЕКИ АМУДАРЬИ

АННОТАЦИЯ: *В условиях нарастающего экологического кризиса в Приаралье, вызванного истощением водных ресурсов и деградацией экосистем, особую значимость приобретают комплексные полевые и дистанционные исследования состояния озёрных систем дельты реки Амударьи. В данной статье представлены результаты экспедиционного обследования, проведённого в мае 2025 года в рамках реализации пунктов «Дорожной карты» по улучшению санитарно-экологической обстановки в Южном Приаралье. Исследования охватили ключевые водоёмы региона, включая Междуреченское водохранилище, Рыбачий и Муйнакские заливы, озеро Судочье и залив Джылтырбас. Оценивались гидрологические, гидрохимические и визуально-экологические параметры: уровень минерализации и температуры воды, характер водной растительности, состояние береговых линий и водохозяйственной инфраструктуры. Кроме того, был проведён анализ динамики водной поверхности на основе спутниковых снимков Landsat-8 за 2015–2025 гг., что позволило выявить пространственно-временные изменения площади водоёмов и тенденции их обмеления. Выводы статьи подчёркивают необходимость целенаправленного регулирования водоподачи, систематического мониторинга по данным дистанционного зондирования (ДЗЗ) и усиления экологических мероприятий для сохранения уникальных природных комплексов дельты Амударьи.*

Ключевые слова: *Южное Приаралье, дельта реки Амударьи, мониторинг, спутниковые снимки, водоёмы, экологическое состояние, водохозяйственные сооружения, биоразнообразие.*

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MONITORING THE MAIN LAKE SYSTEMS OF THE AMU DARYA RIVER DELTA

ABSTRACT: *In the context of the increasing ecological crisis in the Aral Sea region due to the depletion of water resources and the degradation of ecosystems, comprehensive field and remote studies on the state of the lake systems in the Amu Darya river delta are of great importance. This article presents the results of an expedition survey conducted in May 2025 as part of the implementation of points from the roadmap to improve the sanitary and environmental situation in the southern Aral Sea region. The research covered key reservoirs in the area, including Mezhdurechenskoye Reservoir, Rybachy Bay and Muynak Bay, Lake Sudochye, and Jyltyrbas Bay. Hydrological, hydrochemical, and visual-ecological parameters were assessed, including the level of mineralization, temperature of water, nature of aquatic vegetation, condition of coastlines, and water infrastructure. In addition, an analysis of the dynamics of the water surface based on Landsat-8 satellite images for the period 2015-2025 was conducted. This analysis allowed us to identify spatio-temporal changes in the areas of reservoirs and trends towards their shallowing. The conclusions of the study emphasize the need for targeted water supply management, systematic monitoring using remote sensing data, and strengthened environmental measures to protect the unique natural complexes of the Amu Darya Delta region.*

Keywords: *Southern Aral Sea region, Amu Darya river delta, monitoring, satellite images, water bodies, environmental status, water management facilities, biodiversity.*

ВВЕДЕНИЕ

Южное Приаралье, дельта реки Амударья, в пределах Муйнакского района Республики Каракалпакстан, на сегодняшний день представляет собой одну из наиболее пострадавших территорий в регионе Центральной Азии. Здесь, на стыке водной и пустынной экосистем, наблюдается глубокий и

продолжающийся экологический кризис, вызванный антропогенными факторами и климатическими изменениями. Регион является ключевой зоной внимания для экологов, гидрологов и международного сообщества, поскольку последствия разрушения природной среды в этом районе носят трансграничный и долговременный характер [1,2].

Основной причиной деградации Южного Приаралья является критическое сокращение водных ресурсов, поступающих в дельту Амударьи. Это связано с интенсивной хозяйственной деятельностью в бассейне Аральского моря — в первую очередь, с несбалансированным водоотбором для нужд ирригационного земледелия. Регулирование стока рек Амударья и Сырдарья с целью обеспечения сельского хозяйства привело к практически полному прекращению естественного питания Аральского моря, что стало триггером масштабного экологического кризиса.

Ситуация усугубляется отсутствием стабильного притока воды. За период с 2013 по 2024 год в Южное Приаралье поступило 44,15 км³ воды, что в среднем составляет 4,42 км³ в год. Годовая вариация, от критических 1,32 км³ (в 2018–2021 гг.) до 10,72 км³ (в 2017 году), отражается на гидрологической устойчивости и резко дестабилизирует водно-солевой режим водоёмов [3]. Действующий режим водоснабжения формируется без чёткой системы управления и находится под воздействием неконтролируемых факторов, что приводит к деградации отдельных озёрных экосистем и снижению уровня биоразнообразия. Из-за зарегулированности основных рек бассейна Арала (Амударья и Сырдарья), произошло резкое падения уровня Аральского моря и сильного его осолонения, полностью вымерла его аборигенная ихтиофауна, многие эндемичные виды ракообразных и моллюсков этого водоема находятся на грани исчезновения.

В результате неразумного вмешательства в регулирование трансграничных рек региона уровень Аральского моря стремительно и катастрофически снизился. Оно сопровождается резким увеличением засолённости воды вследствие чего была полностью уничтожена аборигенная ихтиофауна — исчезли ценные промысловые виды рыб, находящиеся в экосистеме на вершине пищевой цепи. Многие виды ракообразных и моллюсков, ранее обитавших в Арале, теперь либо исчезли, либо находятся на грани исчезновения.

Огромные участки осушенного дна моря стали источником пылевых и солевых бурь, которые переносят загрязнённые частицы на сотни километров, ухудшая качество воздуха, здоровья населения и плодородия почв по всему Приаралью.

В последние годы правительство Республики Узбекистан уделяет приоритетное внимание восстановлению дельты реки Амударья. Создаются гидротехнические сооружения, развиваются искусственно обводнённые ландшафты на территории осушенного дна моря, всё эти мероприятия направлены на восстановление природного водного режима Южного Приаралья.

24 августа 2018 года в Туркменистан, в рамках Саммита глав государств-учредителей МФСА, Президент Республики Узбекистан Ш.М. Мирзиёев представил ряд стратегических инициатив, направленных на улучшение экологической обстановки в зоне Аральского кризиса [4]. Выдвинутые инициативы были направлены на усиление межгосударственного взаимодействия, мобилизацию международной поддержки, а также реализацию конкретных природоохранных и социально-экономических мероприятий в Приаралье. В результате, правительством Республики Узбекистан был утверждён План практических действий («дорожная карта») по реализации предложенных мер. В соответствии с положениями указанной «дорожной карты» и в рамках государственного бюджетного финансирования, НИЦ МКВК организовал и провёл экспедиционные исследования экологического состояния территории Южного Приаралья.

ЦЕЛЬ ИССЛЕДОВАНИЙ

Проведение комплексных экологических и гидрологических натурных исследований, направленных на оценку текущего состояния водных объектов на территории Южного Приаралья.

1. Задачи и содержание натурных исследований

Натурные исследования включают в себя визуальный осмотр и первичную оценку состояния водных объектов дельтовой зоны Амударьи на территории Муйнакского района Республики Каракалпакстан. Оценка проводилась с учётом имеющейся информации, предоставленной Дельтовым управлением Министерства водного хозяйства Республики Каракалпакстан.

Объекты обследования выбирались с учётом их репрезентативности, доступности и значимости для поддержания водно-экологического баланса региона.

2. Состав и методика обследования

В рамках полевых работ проведены замеры ключевых гидрологических и гидрохимических параметров, температуры и минерализации воды, в контрольных точках наблюдения. Измерения выполнялись членами экспедиционной группы при помощи портативного прибора «ProCheck».

Дополнительно, в целях сопоставления и анализа, использовались архивные материалы и фондовые данные НИЦ МКВК, а также данные, предоставленные Дельтовым управлением Приаралья Министерства водного хозяйства Республики Каракалпакстан.

По всем контрольным маршрутам осуществлялась точная координатная и высотная привязка точек наблюдений с использованием GPS-оборудования. Все наиболее характерные участки и объекты мониторинга были зафиксированы с помощью цифровой фотосъёмки и представлены в настоящем отчёте в виде иллюстративного материала.

Общая протяжённость экспедиционного маршрута составила порядка 2500 км, при этом было зафиксировано и обследовано 27 комплексных контрольных точек

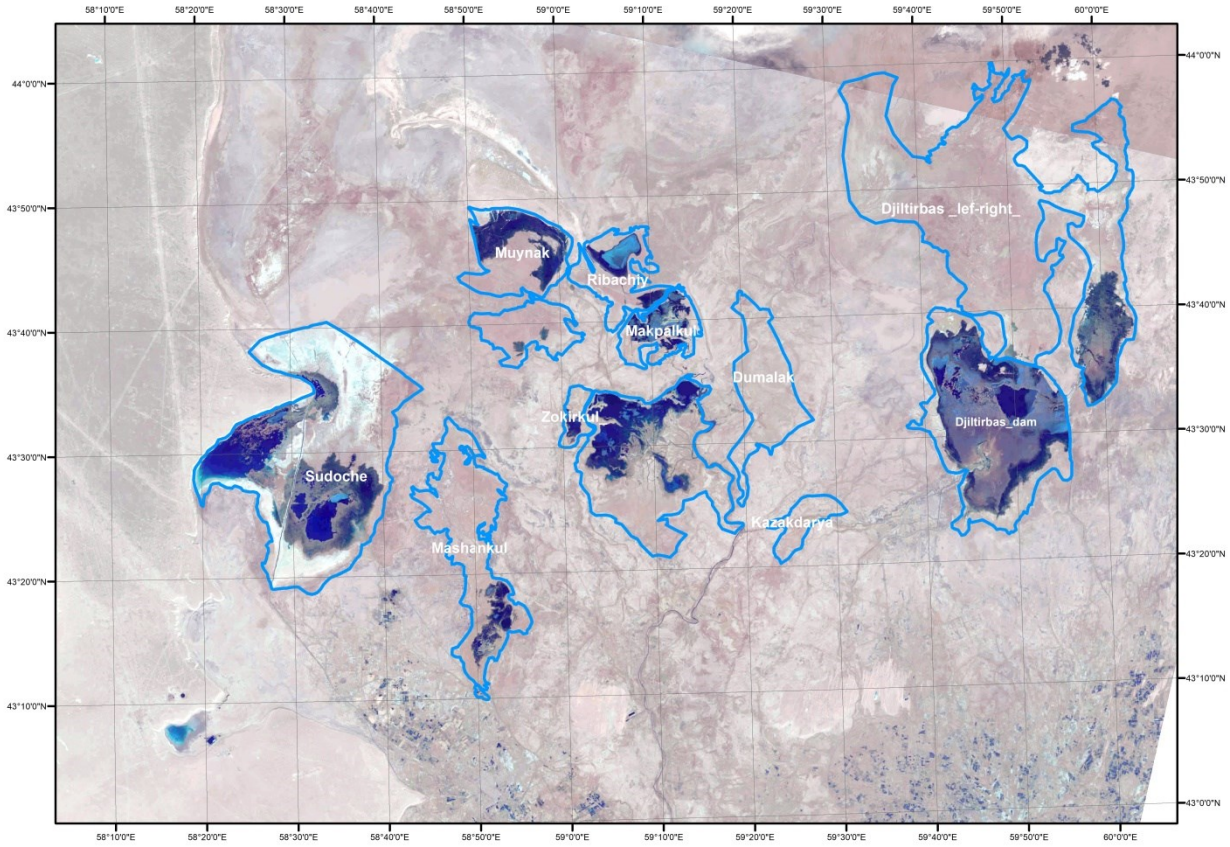

Рис.1. Карта объектов исследования экспедиции

3. Картографическое и техническое обеспечение исследований

Для целей пространственного анализа и навигации в ходе полевых исследований использовались следующие материалы и оборудование:

1. Космические снимки высокого разрешения, полученные из архивов Google Earth, а также спутниковые данные Landsat-8 и Sentinel-2 за апрель–май 2025 года (предоставлены НИЦ МКВК);

2. Схематическая карта исследуемой территории масштаба 1:250 000, подготовленная специалистами НИЦ МКВК;

3. Цифровая карта маршрута экспедиции, разработанная с использованием программного обеспечения QGIS;

4. Портативный GPS-навигатор Garmin Etrex 30x для координатной привязки точек и маршрутов.

ОСНОВНЫЕ РЕЗУЛЬТАТЫ ЭКСПЕДИЦИИ

Экспедиционные обследования, были организованны из предместья г. Муйнак, и охватили ключевые озёрные и водохозяйственные системы дельты Амударьи: Междуреченское и Муйнакское водохранилища, озёра Судочье и Джылтырбас, а также прилегающие участки высохшего дна Аральского моря.

Междуреченское водохранилище является центральным водоёмом в дельте Амударьи, играющим ключевую роль в распределении водных ресурсов для хозяйственных нужд города Муйнак, посёлков Шеге, Кзылжар и ряда других населённых пунктов, находящихся в зоне его влияния. Кроме

того, водохранилище питает Рыбачий и Муйнакские заливы. Через одиннадцать прокопов, образовавшихся в месте прорыва дамбы, водохранилище также соединено с озером Майпост, обеспечивая сток паводковых вод в русло Амударьи (р. Акдарья). Водохранилище принимает основной речной сток, от которого зависит режим остальных водоёмов региона, что делает его наиболее сложным в эксплуатации гидротехническим объектом дельты. Здесь возможно возникновение критических ситуаций при прохождении максимальных расходов воды. Водоём расположен между современным руслом Амударьи (р. Акдарья) и высохшим руслом Кипчакдарья. После строительства дамбы в русле Акдарьи произошло накопление воды и формирование Междуреченского водохранилища. На момент обследования примерно 20% площади водохранилища со стороны Кипчакдарьи были покрыты тростником и другой водной растительностью, включая зелёные водоросли, что обусловлено отсутствием водообмена. В противоположной части, где осуществляется поступление воды из Амударьи, водная растительность отсутствует, вода остаётся прозрачной. В ходе маршрута была осуществлена остановка в районе гидропоста на канале Главмясо, который обеспечивает подачу воды в Рыбачий залив через систему Макпалкул.

Муйнакский залив, расположено на южной окраине бывшего дна Аральского моря. На севере оно граничит с пустыней Кызылкум (бывший полуостров Тигровый Хвост), вдоль северной границы находятся посёлки Учсай и Токмак. С западной стороны построены ограждающие дамбы протяжённостью около 11 км, а также два водосбросных сооружения. Восточная часть граничит с городом Муйнак и озером Сарыбас (в переводе с каракалпакского — «жёлтая голова»), образовавшимся на месте прежнего Рыбачьего залива. Основным источником водоснабжения водоёма является канал Муйнак (также известный как Главмясо), берущий начало от Междуреченского водохранилища в районе посёлка Кызылжар. В настоящее время на территории залива активно размещаются буровые установки, осуществляющие разведку потенциальных нефтяных и газовых месторождений. Рыбохозяйственное значение водоёма полностью утрачено. Единственным текущим назначением залива является использование как пастбища для выпаса домашнего скота жителей города Муйнак. Почти вся акватория покрыта тростником и другой болотной растительностью. При отсутствии мер по улучшению экологического состояния, прежде всего за счёт увеличения объёмов водоснабжения, прогнозируется, что в течение 5–6 лет залив полностью утратит свой статус как водоём.

Озёра Судочье — ценный природный комплекс, включённый в охраняемую территорию. Система включает 4 основных озера и множество мелких водоёмов. Питание осуществляется через коллекторы ККС и Устюрт. Восточная часть данной территории преимущественно песчаная, с редкими зарослями тамарикса и единичными участками тростника. Примерно в 100 метрах западнее вдоль трассы наблюдаются более густые заросли тростника

и тамарикса. Следует отметить, что тростник на момент осмотра был высохшим, тогда как тамарикс сохранял зелёную окраску.

Озеро Джылтырбас — одно из последних устойчивых водно-болотных угодий региона. На севере оно граничит с Восточным (Большим) Аральским морем, а на северо-востоке отделено обвалованной насыпной дамбой. Отметка гребня дамбы составляет 52,0 м, её общая протяжённость — около 14 км. С восточной стороны к озеру примыкает коллектор КС-3. Водоём является мелководным и характеризуется значительным количеством плесов, а также обширными зарослями тростника. Формирование озера происходит за счёт сброса коллекторно-дренажных вод из коллекторов КС-1 и КС-3, а также периодических паводковых сбросов речных вод по протоке Казахдарья. Основными источниками подпитки озера выступают протока Казахдарья и несколько термальных артезианских скважин. На фоне продолжающегося катастрофического усыхания приаральских озёр, Джылтырбас представляет собой одно из наиболее значимых водно-болотных и рыбохозяйственных угодий региона. В настоящее время в северной и северо-восточной части озера наблюдается прогрессирующее обмеление, сопровождающееся сокращением площади акватории, снижением численности рыбных ресурсов и утратой значимости водоёма как места гнездования и миграционного остановочного пункта водоплавающих птиц.

Западная часть Аральского моря на протяжении маршрута на осушенной части дна Аральского моря наблюдалось большое количество действующих буровых установок. Дороги, как правило, отсутствовали, ориентирование происходило по заранее подготовленной карте маршрута.

По маршруту обследования были видны подготовленные неглубокие арыки, предназначенные для посадки саксаула в рамках лесомелиоративных мероприятий. Встречались — естественные заросли тамарикса, карабарака и других типичных для региона видов пустынной и полупустынной растительности, которые тянулись вплоть до уреза Западного Аральского моря.

МИНЕРАЛИЗАЦИЯ ВОДЫ

В рамках проведенной экспедиции осуществлялся отбор проб воды из 27 различных точек с целью определения степени ее минерализации (рис.3). Определение минерализации воды производилось непосредственно на месте отбора проб с использованием портативного солемера «ProCheck», что позволило оперативно получать данные о содержании растворенных солей. Сводные результаты, полученные в ходе исследования, включая географическое положение обследованных точек, зафиксированные уровни минерализации и температуру воды, представлены в таблице 1.

Таблица 1

Список исследуемых объектов, их координаты, минерализация и температура воды

№	Наименование объекта	Минерализация мг/л	Температура воды (С)
1	Канал Муйнак (Главмясо)	1145	27,5
2	Кипчак даря, озеро Шеге	*50 м от берега =1380 *100 м =1240	27,4 25,5
3	Маринкинузяк	1048	28
4	Междуреченское вдх	1405	28,2
5	Русло амударьи	1150	27,7
6	Рыбачье	1790	29,3
7	Рыбачье	2300	29,8
8	Протока из Рыбачьего	1728	30
9	Муйнакский залив	1952	33,1
10	Сооружение (маунакский залив)	2440	27,9
11	Судочье, воды нет		
12	Судочье (яма, была вода, песок, барханы)		
13	Бухарский канал (построенный методом взыва) стоячая вода	46000	25,4
14	Отводящий канал	23250	26
15	Судочье, Урга	*50 м от берега =8540 *100 м =7370 *200 м =7400	25,6 25,3 24,8
16	Оз.Тайлы, камыш, воды нет		
17	Оз.Акушпа, соленая голая почва, воды нет, болото.		
18	ККС	4650	30
19	Старое русло Амударьи (сухое)		
20	Амударья	1380	27,5
21	Русло Амударьи	1690	26,5
22	Канал (Рашидовский) впадает в озеро Думалак, сухой.		
23	Казакдарья	3480	27,3
24	КС-1	3690	28,7
25	Сооружение соединяющее КС-1 и КС-2	4380	28
26	Оз.Джилтырбас	*50 м от берега =6740 *100 м =6370	25,6 25,3
27	КС-3	5850	25,9

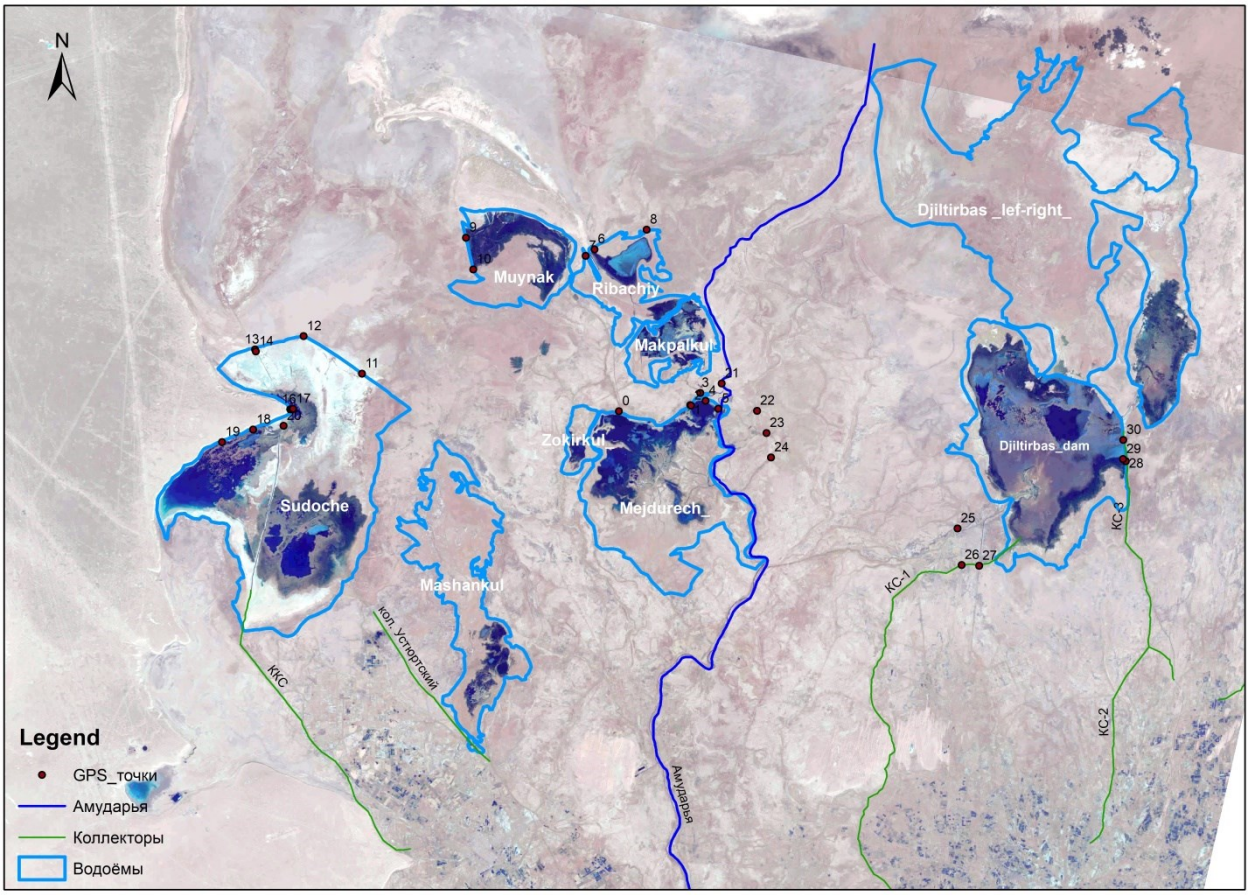

Рис.3. Замеры минерализации воды

Среди обследованных водоемов наблюдается значительное разнообразие уровней минерализации. Это влияет на качество и пригодность воды для различных целей, таких как бытовое использование, ирригация и питьевое водоснабжение. Низкая минерализация (≤ 1400 мг/л) обеспечивает возможность безопасного использования, в то время как высокий уровень минерализации (> 7000 мг/л) делает воду непригодной.

Маринкинузяк и Канал Муйнак показывают наилучшие показатели минерализации, что делает их безопасными для использования в хозяйстве и сельском водоснабжении. Более сложная ситуация наблюдается с Руслом Амударьи и Кипчак даря, где минерализация варьируется, но всё еще остаётся в приемлемых пределах.

Бухарский канал демонстрирует исключительно высокий уровень минерализации, что делает его опасным для всех форм использования. Это указывает на серьезные экологические проблемы, такие как накопление вредных веществ и загрязнителей, вызванные человеческой деятельностью (например, техногенные стоки, сточные воды).

Отводящий канал также показывает крайне высокий уровень минерализации и подразумевает необходимость строгих мер по предотвращению утечек и угрозы загрязнения окружающей среды. Эта

ситуация требует внимания как со стороны государственных органов, так и сообщества.

Водоемы, такие как Судочье, Урга и Озеро Джилтырбас имеют высокий уровень минерализации, что указывает на их деградацию и потенциальную угрозу для сельского хозяйства и экосистемы.

МОНИТОРИНГ ВОДНОЙ ПОВЕРХНОСТИ ПО СПУТНИКОВЫМ СНИМКАМ

На основании исследований спутниковых снимков Landsat 8 за период 2015–2025 гг. проведена оценка динамики водной поверхности озёрно-водохозяйственной системы Южного Приаралья. Обработка осуществлялась по данным за май каждого года. По результатам исследований были выявлены общие тренды сокращения площади водной поверхности, так и отдельные случаи стабилизации или увеличения. Ниже в таблице представлена динамика изменения площади водной поверхности по данным спутниковых снимков Landsat 8 за период 2015–2025 гг.

Таблица 2

Водная поверхность по спутниковым снимкам, (га)

Наименование объектов	**Проектная площадь, га**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
оз.Судочье	72697	27857	26050	25742	41672	15867	24725	11984	9009	9473	10858	9854
Междуреченское вдх.	37784	5197	7774	21602	4755	5464	5678	2890	1389	1827	2651	1813
оз.Рыбачье	11493	2159	2524	4432	3852	825	2618	1411	628	1871	1822	1586
оз.Мунак	16164	612	1151	738	1329	239	1012	179	23	129	212	339
оз.Джилтырбас	47472	6204	6014	6948	11670	6119	4891	5401	4813	5300	5975	6822
оз.Макпалкуль	8684	1297	192	1798	1134	911	401	678	401	409	302	267
оз.Машанкуль	27201	817	548	538	3393	751	661	363	33	663	100	560
оз.Закиркуль	2791	97	206	826	58	120	8	17	1	22	116	131

Из таблицы 1, видно, что наибольшее уменьшение площади водной поверхности наблюдаются:

1. Озеро Судочье. В течение анализируемого периода (2015–2025 гг.) площадь водной поверхности озера существенно сократилась — с 27 857 га в 2015 году до 9 854 га в 2025 году, что соответствует снижению на 64,62%. Наибольшая площадь водного зеркала была зафиксирована в 2018 году и

составила 41 672 га. Минимальное значение площади наблюдалось в 2022 году — 9 009 га, что указывает на критическое обмеление озера. Несмотря на незначительное увеличение в последующие годы, общая тенденция остаётся нисходящей.

2. Междуреченское водохранилище. За период с 2015 по 2025 гг. площадь водной поверхности водохранилища сократилась с 5 197 га до 1 813 га, что составляет уменьшение на 65,11%. Максимальная площадь зафиксирована в 2017 году — 21 602 га. Минимальное значение наблюдается в 2022 году, когда площадь водного зеркала сократилась до 1 389 га.

3. Озеро Рыбачье. За десятилетний период мониторинга (2015–2025 гг.) площадь озера сократилась с 2 159 га до 1 586 га, что составляет уменьшение на 26,54%. Максимальная площадь водного зеркала озера зафиксирована в 2017 году — 4 432 га. Минимальная площадь озера отмечена в 2022 году — 628 га.

4. Озеро Муйнак. Согласно данным спутникового мониторинга, площадь озера за период 2015–2025 гг. сократилась с 612 га до 339 га, что соответствует уменьшению на 44,60%. Максимальная площадь водного зеркала была зафиксирована в 2018 году – 1 329 га. Существенное уменьшение произошло в 2018–2019 гг. Минимальная площадь озера зафиксирована в 2022 году — 23 га.

5. Озеро Макпалкуль. В течение периода наблюдений с 2015 по 2025 гг. площадь водной поверхности озера сократилась с 1 297 га до 267 га, что соответствует уменьшению на 79,41%. Максимальная площадь озера наблюдалась в 2018 году — 11 670 га. Минимальное значение зафиксировано в 2016 году, площадь озера сократилась до 192 га. Озеро Макпалкуль демонстрирует типичный пример малых водоёмов, наиболее уязвимых к климатическим колебаниям и водохозяйственным изменениям.

Указанные выше объекты демонстрируют устойчивую тенденцию к снижению уровня наполнения и деградации водной поверхности, вероятно, вследствие комплекса климатических и антропогенных факторов, включая изменение режима водоснабжения, засушливые условия и повышение температуры воздуха.

Были выявлены два водоема с положительной динамикой увеличения площади водного зеркала:

1. Озеро Джилтырбас. В отличие от большинства водоёмов региона, озеро Джилтырбас за период 2015–2025 гг. демонстрирует положительную динамику: площадь водной поверхности увеличилась с 6 204 га до 6 822 га, что составляет прирост на 9,96%. Максимальная площадь озера наблюдалась в 2017 году — 1 798 га. Минимальная площадь зафиксирована в 2022 году – 4 813 га. Озеро Джилтырбас представляет собой уникальный пример стабилизации или восстановления водоёма в условиях общего снижения водообеспеченности региона, что делает его объектом повышенного интереса для экологических и гидрологических исследований.

2. Озеро Закиркуль. В течение периода наблюдений с 2015 по 2025 гг. площадь водной поверхности озера увеличилось с 97 га до 131 га, что соответствует увеличению на 35,05%. Максимальная площадь озера наблюдалась в 2017 году — 826 га. Минимальная площадь зафиксирована в 2022 году – 1 га.

Таким образом, результаты анализа свидетельствуют об ухудшении водного баланса большей части водоемов региона в течение последнего десятилетия, что требует усиленного внимания со стороны природоохранных, водохозяйственных и климатических служб.

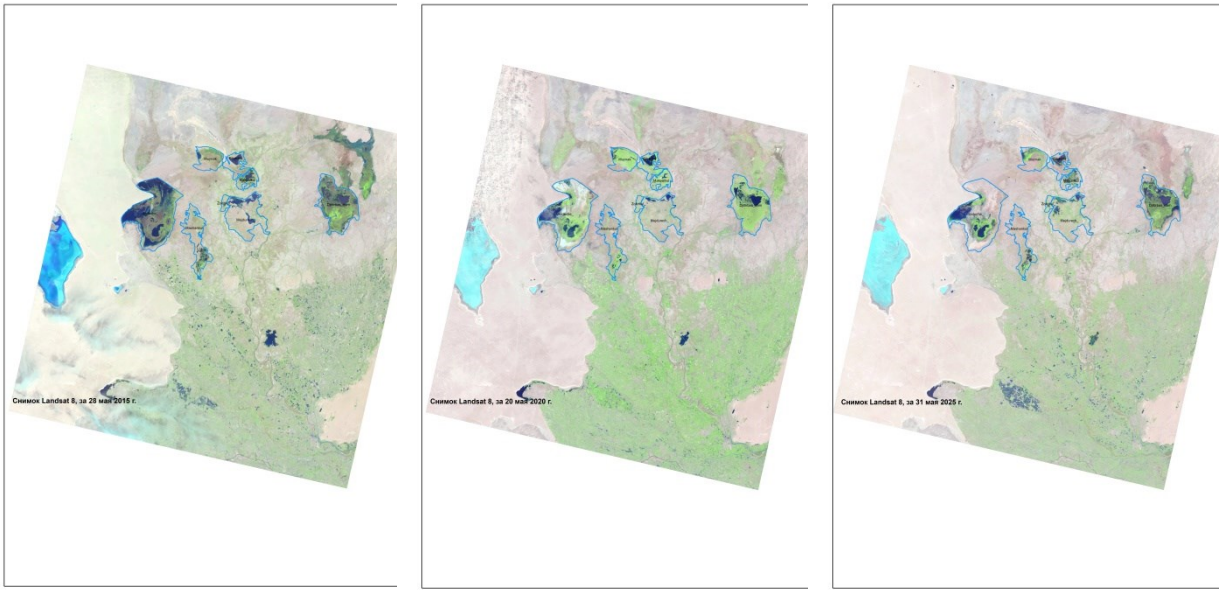

Рис.4. Картографическая визуализация изменений водной поверхности

ОСНОВНЫЕ ВЫВОДЫ И РЕКОМЕНДАЦИИ

Полевые и дистанционные исследования показали критическое состояние озёрных систем Южного Приаралья. Основные проблемы связаны с прекращением стабильной подачи воды, деградацией водохозяйственной инфраструктуры и недостаточной координацией управления водными ресурсами.

Отмечен дефицит квалифицированных кадров в дельтовом управлении, нехватка финансирования, а также слабое взаимодействие между ведомствами, отвечающими за эксплуатацию водоёмов и рыбное хозяйство. Расчёты потерь воды в каналах и коллекторах требуют уточнения и пересмотра.

Наблюдается значительный дефицит водных ресурсов, поступающих в дельту и регион Приаралья. Минимальный объём воды в 3,5 км³, установленный по санитарным попускам, не поддерживается. В связи с этим предлагается рассмотреть инициативу ОАО «Узсувлойиха» и НИЦ МКВК по переброске озёрного коллектора из Хорезмской области в дельту Амударьи и Приаралья. Реализация данного проекта обеспечит приток не менее 4,5 км³ воды, что позволит поддерживать биопродуктивность озёрных систем дельты.

Данный проект находится на рассмотрении Кабинета Министров Республики Узбекистан.

Рекомендуется:

1. Оборудовать гидропосты и обеспечить их автоматизированными датчиками уровня;
2. Модернизировать каналы и коллекторы с учётом проектных параметров;
3. Разработать рыбоводческие программы и создать современные рыбопитомники;
4. Усилить правовую охрану экосистем, особенно в заказнике «Судочье»;
5. Маршрут экспедиции представляет большой интерес для зарубежных туристов, в этой связи необходимо активизировать экотуризм как форму устойчивого использования природных ресурсов.

Без системных мер по восстановлению водного режима и улучшению управления природными ресурсами регион рискует окончательно потерять ценные водно-болотные экосистемы и биоразнообразие. Поэтому, возможно изменить параметры водоёмов с учётом объёма воды, распределённой на обширных территориях, с целью обеспечения водоснабжения всей площади.

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ПРОТИВОЭРОЗИОННЫЕ ПОКАЗАТЕЛИ ТЕХНИКИ БОРОЗДКОВОГО ПОЛИВА

Аннотация. *В работе излагается исследование процессов эрозии почв при бороздковом орошении. Результаты показывают что полностью исключить смыв почвы практически невозможно. Поэтому задача состоит в подборе таких элементов техники полива, при которых смыв почвы находился бы в допустимых пределах позволяющий определить необходимые элементы техники нетрадиционной технологии орошения.*

Ключевые слова*: Адир, склон, уклон борозды, рельеф, плодородие почвы, ирригационная эрозия, оросительная сеть, экспоненциальный закон, поливной трубопровод, традиционная технология орошения.*

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EROSION CONTROL INDICATORS OF FURROW IRRIGATION TECHNIQUES

Abstract. *This paper presents a study of soil erosion processes under furrow irrigation. The results show that completely eliminating soil washout is practically impossible. Therefore, the main task is to select irrigation technique elements that keep soil wash within acceptable limits, which helps to determine the necessary components of non-traditional irrigation technologies.*

Keywords: *Adyr (dry foothill zone), slope, furrow gradient, terrain, soil fertility, irrigation erosion, irrigation network, exponential law, irrigation pipeline, traditional irrigation technology.*

Посредством возделывания на основе высоких агротехнических мероприятий и возделывания сельскохозяйственных культур плодородие почвы сохраняется и повышается. Однако, орошение на землях с большими

уклонами и сложными рельефом, связано, прежде всего с опастностью возникновения ирригационной эрозии. Производительная способность земель, подверженных эрозию, резко падает, что приводит к снижению эффективности их освоения. Особенно опасна ирригационная эрозия в маломощных почвах, подстиляемых галечником. Смыв верхнего мелькозема в этом случае – трудно поправимое явление.

Исследование процессов эрозии почв при орошении показывает, что полностью исключить смыв почвы практически невозможно. Поэтому задача состоит в подборе таких элементов техники полива, при которых смыв почвы находился бы в допустимых пределах. Допустимом пределом в данном случае необходимо считать такой объем смыва, который непревышает количества почвы образуюшейся в результате естественных процессов почвообразования.

В задачу расчета оптимальных элементов техники полива по бороздам входит определение расходов поливных струй, длин борозд, и продолжительноси полива, обеспечивающих впитывание заданной поливной

нормы, равномерное увлажнение почвы по длине борозды с заданным коэффициентом равномерности, минимальный поверхностный сброс воды и минимальную (допустимую)величину эрозии почвы.

В процессе разработки мероприятий по противодействию ирригационной эрозии орошаемых легких и типичных сероземных почв Андижанской области выявлены закономерности смыва промывки плодородного слоя почвы от величины параметров техники полива.

В работе рекомендуем использовать алгоритм расчетов, отмечая, что существующие и неизбежные проблемы в способе полива могут быть решены путем выявления и выбора оптимальных вариантов показателей элементов поливной техники.

Одним из основных требований к организации полива на полях с большим уклоном является кардинальное усовершенствование конструкции поливной техники и определение оптимальных показателей элементов техники и технологии поливов.

Алгоритм расчетной методики, использованной на основе экспериментов по изучению техники полива на адирных участках:

1. Максимально допустимое значение водопотребления с начала засушливого сезона определяется по следующей формуле:

$$q_{доп}^{\max} = \left[\frac{0{,}03 \cdot a \cdot Э_{дм}}{\gamma \cdot i^{0.58}} \right]^{3{,}85} \quad \text{м}^3/\text{час}$$

2. Расход воды в начале полива определялся исходя из следующих условий:

$q_{нач}=(0{,}85 \div 0{,}90) \cdot q_{доп}^{\max}$, м^3/час

3. Объем фильтрации поливной воды через борозды определяется следующим образом: $q_у = P \cdot V_{y,} ёкиP = 0{,}0981\left(\frac{q}{\sqrt{i}}\right)^{0{,}21}$

учитывая, это $q_y = 0{,}0981\left(\frac{q_{нач}}{\sqrt{i}}\right)^{0{,}21} \cdot V_y, м^3 / час$

4. Преобразуем норму разового полива в количество адсорбированного слоя воды с влажного периметра поля: $h^{нт} = \frac{m^{нт}_{расt} \cdot a}{10000 \cdot P}$, м

5.Слой воды, который необходимо впитать даже в конце склона с большим уклоном, также должен быть $h_k = h^{нт}$, поэтому

$$h_k = 0{,}122(I - \ell^{-0{,}378t_k}) + 0{,}014t_k, м$$

Из экспоненциального закона t_k, то есть время поглощения воды в конце уравнения определяется как продолжительность поглощения водным слоем h_k;

6. Количество воды, которая должна впитаться в начальной части эгата, определяется следующим образом, чтобы обеспечить коэффициент одной плоскости требуемой и определяемой влажности в виде водного слоя $h_н = \frac{h_k}{K_p}$

Количество воды, необходимое для поглощения в начальной части борозды, то есть продолжительность поглощения водяного слоя $h_н$, определяется, как указано выше $t_н$ (5-пункт);

7. Продолжительность потока воды до конца откоса рассчитывается по следующей связи: $t_д = t_н - t_k$, (час)

8. Длина борозд рассчитывается следующим образом:

$$\ell_г = 814 \cdot 0{,}87 q_н^{0{,}94} \cdot i^{0{,}16}(I - \ell^{-0{,}52tg}), м$$

9. Переменная величина расхода воды определяется по следующей формуле: $q_{изм} = q_у \cdot \ell_г$ ($м^3$/час)

10. Переменная величина нормы полива определяется по следующей формуле: $m^{бр}_{расч} = \frac{m^{нт}_{расч}}{\eta}, (м^3 / га)$

11. Определите продолжительность начального расхода воды:

$$t_{нач} = t_д + t_c, (час)$$

Количество смываемого слоя плодородного слоя почвы по параметрам элементов поливной техники, определяемым на основании описанной выше методики найдено по формуле: $Э = Э_{нач} + Э_{изм}$

где:$Э_{нач}$, $Э_{изм}$ - величина смыва плодородного слоя почвы при задании начального и модифицированного объемов водопотребления с начала поливов. $Э_{нач} = 0{,}372 \cdot q^{3{,}21}_{нач} \cdot i^{1{,}49} \cdot t$

Находит с помощью выражений

Если: $Э_{нач} + Э_{изм}$ сув $> Э_{доп}$ получен результат, параметры элементов техники полива, определенные выше, должны быть уточнены.

Для светло-сероземных почв Андижанской области в программу будут включены следующие данные [3]:

По длине борозды заданное значение коэффициента равномерности увлажнения $K_р$-0.9

Расчетная норма полива m=900 $м^3$/га;

Расстояние между рядами, а =0,6…0,9 м

Уклоны борозд получены данные в таблице по уклону земельного фонда Андижанской области- (от i = 0,008 до… 0,1)[3];

Коэффициент использования воды (КИВ =0.90);

Ирригационная эрозия допустимое количество $Э_{доп}$ =2,2т/га [3];

Величина установившейся скорости впитывания воды почвой, $V_{уст=}$0,26 м/сек;

Время стабилизации расхода сбросной воды, t_c =15…18 часов;

Результаты расчетов показывают, что при определении оптимальных значений параметров оросительного оборудования указанным выше методом теоретически доказано резкое снижение количества ирригационной эрозии, которая может возникнуть на орошаемых полях. Однако на практике визуально распределить такое небольшое количество поливной струйи владельцам по полю с высокой точностью - очень сложная задача. Поэтому, безусловно, улучшение ирригационных сетей в регионе, автоматизация и механизация поливного процесса - одна из актуальных задач сегодняшнего дня.

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ОСОБЕННОСТИ ПОДГОТОВКИ ИНЖЕНЕРНЫХ КАДРОВ В НЕФТЕГАЗОВОЙ СФЕРЕ

Аннотация: *Рост и модернизация нефтегазовой отрасли обусловливают необходимость подготовки инженерных специалистов с высоким уровнем профессиональной подготовки. В статье рассмотрены особенности подготовки кадров в технических вузах, анализируются ключевые затруднения системы инженерного образования и представлены предложения по её совершенствованию*

Ключевые слова: *инженерное образование, проектные технологии, цифровая трансформация, практика, нефтегазовый сектор.*

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SPECIFICS OF PREPARING ENGINEERING SPECIALISTS FOR THE OIL AND GAS SECTOR

Abstract: *The growth and modernization of the oil and gas industry necessitate the training of engineering specialists with a high level of professional competence.*
This article examines the specific features of engineering personnel training at technical universities, analyzes the key challenges of the current engineering education system, and presents proposals for its improvement.

Key words: *engineering education, project-based technologies, digital transformation, practical training, oil and gas sector*

Современное техническое образование играет определяющую роль в формировании кадрового потенциала, особенно в условиях стремительной цифровизации и внедрения инновационных производственных решений. В то же время, образовательные учреждения сталкиваются с трудностями адаптации к быстро меняющимся требованиям производственного сектора.

Нефтегазовая промышленность остаётся стратегически важной отраслью экономики, обеспечивая энергетическую безопасность и экспортный потенциал страны. Эффективное функционирование данной отрасли невозможно без инженерных специалистов, способных разрабатывать

и внедрять современные технологические решения. Подготовка таких специалистов требует от системы высшего образования гибкости, инновационности и ориентации на потребности производства. В данной статье рассматривается внедрение модели дуального образования в нефтегазовом инженерном обучении как одного из действенных инструментов повышения его эффективности.

В подготовке отраслевых кадров инженерное образование традиционно занимает центральное место в структуре высшего технического образования. Несмотря на наличие сильной теоретической базы, сохраняется проблема недостаточной практической подготовки. Основные проблемы:

- Отсутствие доступа к современному лабораторному оборудованию;
- Слабая связь вузов с реальным сектором экономики;
- Недостаток преподавателей с промышленным опытом;
- Устаревшие учебные планы.

Во всем мире развивается инновационное инженерное образование, направленное не только на формирование фундаментальных знаний и навыков, но и специальных компетенций, ориентированных на то, как применять их на практике при создании новых конкурентоспособных технологий и технологий. Система образования адаптируется к условиям информационного общества: распространяется поле электронного обучения, создаются открытые электронные образовательные ресурсы. Эти ресурсы, разработанные университетами, интегрированы во многие информационные системы, которые образуют глобальные университетские сети.

Мировые тенденции в области обеспечения качества высшего образования:

• установление единых критериев обеспечения и гарантирования качества образования европейских стран в рамках Болонского процесса, включая переход к кредитной системе (система зачета);

• создание, развитие и гармонизация национальных систем аккредитации образовательных программ (ОП);

• акцент на внутреннее обеспечение качества, разработку и внедрение университетских систем качества на основе различных моделей (ISO, EFQM, ENQA и т.д.);

• развитие системы качества электронного обучения;

• широкое использование систем профессиональной и общественной аккредитации ОП;

• применение профессиональных стандартов при разработке документов, определяющих требования к содержанию и условиям ОП;

• включение учащихся в процедуры обеспечения качества;

• использовать бенчмаркинг для изучения качества и эффективности других вузов и применения их методов;

использование эффективных механизмов взаимодействия между университетом и предприятием;

• совершенствование системы управления университетом на основе систем управления качеством (значительная часть основных функций управления университетом связана с качеством);

• развитие международного сотрудничества в сфере гарантирования качества образования.

Обеспечение качества образования в вузе - вид деятельности, включающий стратегическое планирование, кадровую политику, четкую организацию работы, материально-техническую базу, финансовые ресурсы и т. д., а также управление качеством. Управление качеством относится к оперативным методам и операциям, используемым для удовлетворения требований к качеству. Управление качеством требует формализованных процедур управления на основе модели учебного процесса [1].

Международные критерии качества инженерного образования, используемые при аккредитации инженерных программ в университетах разных стран, определяются Вашингтонским соглашением (для стран с англоязычной системой образования) и Европейской сетью аккредитации инженерного образования (для стран-участниц Болонского процесса). Общеевропейские требования к оценке качества инженерных образовательных программ изложены в документе «EUR-ACE Рамки Стандарты аккредитации инженерных программ» [2].

Для повышения результативности подготовки специалистов необходимо ориентироваться на мировые образовательные тренды. Среди них — внедрение гибких цифровых платформ, интеграция электронных образовательных ресурсов, развитие проектного и междисциплинарного обучения, а также аккредитация образовательных программ в соответствии с международными стандартами (EUR-ACE, Washington Accord).

Образовательные организации должны внедрять внутренние системы обеспечения качества, охватывающие стратегическое планирование, ресурсное обеспечение и систему мотивации. Модели управления качеством, основанные на стандартах ISO и EFQM, становятся ключевыми инструментами повышения конкурентоспособности вузов.

Особого внимания заслуживает развитие электронного обучения. Использование LMS-платформ (Moodle, Ilias и др.) позволяет формировать интерактивную и персонализированную образовательную среду, где студенты могут осваивать сложные технические дисциплины в удобном темпе [2].

Также необходимо: обновить образовательные траектории с фокусом на развитие исследовательских и инженерно-практических навыков; активизировать участие студентов в реальных проектах; внедрять цифровые симуляторы и 3D-моделирование для отработки практических сценариев; поощрять сотрудничество с работодателями при разработке учебных планов.

В результате вышеупомянутых проблем и недостатков выпускники технических учебных заведений первоначально сталкиваются с трудностями. Во-первых, это требует постоянной работы над собой для формирования собственных навыков и необходимого уровня мастерства. Во-вторых, эта

ситуация требует от специалиста с неразвитыми инновационными способностями постоянно работать над поиском, анализом и постоянным использованием самой необходимой информации в технологическом процессе. Поэтому главная задача высшего учебного заведения - создать образовательную среду, которая в интересах общества позволила бы подготовить современного специалиста с высоким уровнем мастерства, готового к инновациям.

Для решения вышеперечисленных задач на современном уровне необходима комплексная взаимосвязь естественнонаучного, общетехнического и специального циклов дисциплин на информационной основе. Это допустимо только на основе подготовки студентов по техническим специальностям на основе комплексной информационно-образовательной системы.

В итоге, целью инженерного образования становится подготовка профессионала нового поколения — компетентного, гибкого, обладающего высоким уровнем адаптивности к вызовам современной производственной среды.

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АНАЛИЗ ОСНОВНЫХ ПОКАЗАТЕЛЕЙ ЩЕЛОЧНОЙ КОЛОННЫ ОЧИСТКИ ПИРОГАЗА

Аннотация: *Статья посвящена анализу технологического процесса щелочной очистки пирогаза. Рассмотрены конструктивные исполнение и технологические особенности эксплуатации колонны щелочной очистки, а также перспективы интенсификации процесса.*

Ключевые слова: *пирогаз, щелочная очистка, абсорбция, CO_2, H_2S, NaOH.*

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ANALYSIS OF KEY PERFORMANCE INDICATORS OF THE ALKALINE COLUMN FOR PYROLYSIS GAS PURIFICATION

Abstract: *The article is devoted to the analysis of the technological process of alkaline purification of pyrolysis gas. The structural design and technological features of the operation of the alkaline purification column are examined, along with the prospects for process intensification.*

Keywords: *pyrolysis gas, alkaline purification, absorption, CO_2, H_2S, NaOH*

Пирогаз содержит смесь горючих газов и вредных примесей. Их удаление необходимо для повышения качества топлива и снижения вредных выбросов. Наиболее эффективным методом является щелочная очистка, основанная на реакциях нейтрализации.

Щелочная колонна является основным элементом установки очистки пирогаза, в которой происходит контакт газовой и жидкой фазы с целью удаления кислотных примесей. Эффективная эксплуатация этого оборудования требует соблюдения ряда условий и учета эксплуатационных рисков.

Щелочная колонна представляет собой аппарат колонного типа, предназначенный для химической абсорбции кислотных примесей (CO_2, H_2S) из пирогаза с помощью щелочных растворов (NaOH, KOH). Конструктивное исполнение колонны оказывает решающее влияние на эффективность процесса, удобство обслуживания и срок службы оборудования.

Стандартная щелочная колонна имеет вертикальную цилиндрическую форму, высота которой в 5–10 раз превышает диаметр. Оптимальное соотношение высоты к диаметру (H/D) зависит от интенсивности массообмена и состава газа. Диаметр подбирается исходя из требуемой пропускной способности, а высота – с учётом количества насадок и зон контакта.

Корпус колонны и её внутренние элементы (распределители жидкости, насадка, каплеуловители) должны быть выполнены из коррозионностойких материалов: нержавеющей стали (марки 12Х18Н10Т, AISI 316), сплавов с молибденом, либо иметь антикоррозионные покрытия (фторопласт, эпоксидные смолы). Это обусловлено агрессивной средой, содержащей H_2S, CO_2 и щёлочь.

Поддержание стабильного режима абсорбции требует:

- равномерного распределения газа и жидкости по сечению колонны;
- поддержания заданной температуры (оптимально: 40–55 °C)
- регулирования скорости подачи щелочного раствора (например, 2–4 м³/ч на 1000 м³/ч пирогаза);
- контроля уровня пены и предотвращения её выброса за пределы колонны.

В практике применяются:

- насадочные колонны, содержащие керамические, металлические или пластиковые насадки (Pall, Berl saddles), которые обеспечивают развитую поверхность контакта;
- тарельчатые колонны, позволяющие гибко регулировать гидравлический режим и использовать пенное движение жидкости.

Выбор конструкции зависит от производительности установки, состава пирогаза и условий регенерации щёлочи.

Ведение процесса очистки пирогаза в колонне щелочной очистки осуществляется регулированием следующих параметров работы колонны:

-скорость циркуляции раствора едкой щелочи;
-объём подпитки свежего раствора щелочи;
-объём подпитки воды разбавления;
-рабочая температура в колонне;
-удаление образовавшегося «желтого масла».

Эффективность и надёжность процесса щелочной очистки пирогаза напрямую зависят от правильной эксплуатации оборудования, качества реагентов и соблюдения технологических режимов. Рассмотрим ключевые эксплуатационные особенности:

В процессе работы растворы щёлочей насыщаются продуктами абсорбции -карбонатами и сульфидами натрия. Это приводит к снижению абсорбционной способности, изменению pH и увеличению вязкости раствора. Требуется регулярный контроль химического состава и проведение регенерации или частичной замены щёлочи.

Возможна организация замкнутого цикла с регенерацией щелочного раствора. На практике применяются окислительные или термические методы для восстановления щёлочи. Пример реакции регенерации с кислородом:

$$Na_2S + 2O_2 \rightarrow Na_2SO_4$$

Однако эти процессы требуют энергозатрат и специализированного оборудования.

Щёлочь агрессивна к некоторым металлам и уплотнительным материалам. В связи с этим оборудование (реакторы, насосы, трубопроводы) изготавливается из коррозионностойких сплавов (нержавеющая сталь, титан) или с использованием защитных покрытий.

Таблица 1. Условия абсорбции

Параметр	Значение	Примечание
Температура	30–60 °C	Оптимальная зона
Давление	до 0.6 МПа	Рабочее давление
Конц. NaOH	5–15 %	Концентрация раствора

Слишком высокая температура способствует испарению воды из раствора и снижению эффективности абсорбции, а слишком низкая — увеличивает вязкость и затрудняет подачу раствора. Оптимальная рабочая температура составляет 30–60 °C.

На основании проведённого анализа технологических параметров и эксплуатационных характеристик щелочной колонны очистки пирогаза сформулированы следующие научные положения и практические выводы:

Установлено, что степень очистки пирогаза от кислотных компонентов (прежде всего сероводорода и углекислого газа) находится в прямой зависимости от параметров процесса — концентрации щёлочного раствора, температуры и скорости подачи исходного газа. Определены оптимальные диапазоны этих параметров, способствующие достижению высокой эффективности абсорбции.

Показано, что равномерность распределения фаз в рабочем объёме колонны, обеспечиваемая применением эффективных насадочных структур, играет ключевую роль в интенсификации массообменных процессов.

Применение насадок с развитой поверхностью позволяет увеличить зону взаимодействия фаз, что положительно сказывается на глубине очистки.

Проведён сравнительный анализ устойчивости конструкционных материалов колонн. Экспериментально и расчетно подтверждена целесообразность использования коррозионностойких сталей и специальных полимерных покрытий, обладающих высокой химической инертностью к щелочной среде и продуктам абсорбции.

Установлено, что применение теплообменных устройств для предварительного подогрева пирогаза повышает общую энергоэффективность технологического процесса. Экономический анализ

показал снижение удельных энергозатрат до 12–15% при сохранении стабильности эксплуатационных показателей.

Выявлено, что побочные продукты щелочной очистки (сульфиды, бикарбонаты и карбонаты) требуют системного подхода к утилизации или вторичному использованию.

Обоснована необходимость модернизации щелочных колонн путём внедрения автоматизированных систем контроля и управления, включая онлайн-мониторинг уровня pH, температуры и концентрации загрязняющих компонентов в очищенном газе.

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МИЛЛИЙ ҒУРУР ШАКЛЛАНИШИНИНГ ИЖТИМОИЙ-СИЁСИЙ, ИҚТИСОДИЙ ВА МАЪНАВИЙ АСОСЛАРИ

Аннотация: *Ушбу мақолада миллий ғурурнинг тузилиши ва функцияларини унинг намоён бўлиш шакл-кўринишларига қараб тавсифладик. Шунингдек мақолада, ўзининг мазмун-моҳияти ва тузилишига кўра, ҳам миллий туйғу, ҳам кенг қамровли ва кўп қиррали ижтимоий-маънавий ҳодиса, ҳам яна, маълум маънода, моддий ва маънавий жиҳатларга, турли даража ва шакл-кўринишларга эга эканлиги очиб берилган. Айни шу ҳолатлар унинг тузилишига кўра, ўзига хос мураккаб системали характерда эканлиги кўрсатилган.*

Калит сўзлар: *Янги Ўзбекистон, ижтимоий, иқтисодий, сиёсий, маънавият, жамият, миллий ғурур, миллат, динийлик, анъанавийлик, замонавийлик.*

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SOCIO-POLITICAL, ECONOMIC AND SPIRITUAL BASES OF THE FORMATION OF NATIONAL PRIDE

Abstract: *The article describes the structure and functions of national pride in the forms of its manifestation. The article also reveals that in its content and structure, national feeling is a complex and multifaceted socio-spiritual phenomenon, and, in a certain sense, has material and spiritual aspects, different levels and forms. It is shown that these same cases in their structure have a unique complex systemic character.*

Keywords: *New Uzbekistan, social, economic, political, spirituality, society, national pride, nation, religiosity, traditionalism, modernity.*

Биз Янги Ўзбекистон тараққиётининг ҳозирги ривожланиш босқичида ижтимоий, иқтисодий ва сиёсий омиллар билан бирга, маънавий-маърифий жабҳаларда амалга оширилаётган ислоҳотлар ҳам муҳим аҳамиятга эга эканини яхши англаймиз. Шунга кўра, истиқлол йиллари халқимиз миллий ғурурини тиклаб, ривожлантириш жамиятимизни маънавий жиҳатдан янгилаб, юксалтиришнинг асосий вазифаси қилиб белгиланди.

Бошқача айтганда, маънавият - жамиятдаги барча сиёсий-ижтимоий муносабатларнинг мазмуни ва сифатини белгилайдиган пойдевордир. Бу пойдевор қанча мустаҳкам бўлса, халқ ҳам, давлат ҳам шунча кучли бўлади”[1]. Зеро, ҳар қандай инсон, миллат, жамият, давлат мустақил бўлгандагина маромида ривожланиб, юксак тараққиёт босқичларига эришиши мумкин.

Ягона моҳият асосига қурилган бир бутун, яхлит дунё ҳам моддий, ҳам маънавий тузилишига кўра, чексиз даражаларда хилма-хилликка, ранг-баранглиқка эга. Оламдаги инсон тугал англаб етиши учун мураккаб бўлган бундай турфа хиллик, улардаги нарса ва ҳодисаларнинг жойлашув тартиби, ўзгаришлари моҳияти шу даражада мукаммал тузилишга, юз бериш хусусиятига эгаки, уларнинг ҳар бирининг ўз ўрнида бўлиши, ўз маромида ривожланиши - дунё мавжудлигининг шартидир.

Миллатнинг маданияти, тили, тарихи, дини, номи, мафкураси, урф-одат анъаналари; аждодлари ҳаётида шаклланиб, авлодларга ўтиб келаётган яшаш, фикрлаш, сўзлаш, кийиниш тарзлари; ҳис-туйғу, орзу-интилишлари, умумлаштириб айтганда, барча моддий ва маънавий қадриятлари ҳам миллий - ғурур, ҳам миллий ғурур манбаидир. Миллий ғурур миллатнинг ўзлигига эга эканлигини кўрсатади.

Барча ижтимоий-миллий хусусиятларни юзага келтирувчи моддий ва маънавий асослар, объектив ва субъектив омиллар миллат шаклланиши билан боғлиқ. Бинобарин миллий ғурур ҳам миллатнинг вужудга келиши билан бирга шаклланиб, ривожланади, унинг негизида миллийлик ётади. «Миллийликнинг ижтимоий макони миллатдир»[2]. Шу боис, миллий ғурурнинг ижтимоий-маънавий, сиёсий, иқтисодий, тарихий асосларини, унинг бутун мазмун-моҳияти ва шаклланиб, ривожланиш қонуниятларини тўлароқ тушуниб олиш учун, аввало, миллат - миллийликни, бу ўринда, ўзбек халқи миллийлигининг ўзи нима эканлигини, унинг ижтимоий-тарихий жараёнларда тутган ўрни ва ўзига хос хусусиятларини, энг муҳими, миллийлигимизнинг истиқболдаги аҳамиятини аниқ-равшан билиб, англаб, тушуниб олиш лозим.

Дунёдаги барча халқларнинг ўзларига хос миллий хусусиятларини ифодалаб, изоҳловчи турли-туман тушунчалар, ранг-баранг истилоҳ ва иборалар мавжуд. Шулардан бири миллатимиз номидан келиб чиққан *ўзбекчилик* тушунчасидир. Фикримизча, ўзбек халқи миллий ғурурининг ижтимоий-маънавий асосини худди ана шу - ўзбекчилик билан боғлаб талқин этиш тўғри бўлади. Шунинг учун биз, бу ўринда, халқимиз миллий ғурурининг ижтимоий-маънавий асосларини таҳлил қилиш билан бирга, илмий жамоатчилигимизни ҳам диққат эътиборини ушбу тушунчага қаратмоқчимиз.

Маълумки, кишилардаги барча салбий ва ижобий хусусиятлар миллат яшаётган ижтимоий макон ва тарихий замондаги мавжуд ижтимоий-иқтисодий, сиёсий, маънавий жараёнлар таъсирида шаклланиб, ривожланади. Бироқ, инсонлар фақатгина «ижтимоий муносабатлар маҳсули»гина

бўлмасдан, юксак онгли мавжудод сифатида, маълум маънода, мустақил табиий имкониятлар эгаси ҳамдир. Шунинг учун улар ўзлари яшаётган атроф-муҳитга, жамиятдаги мавжуд ижтимоий-иқтисодий жараёнларга субъектив тарзда жуда катта, баъзан эса, асосий ва ҳал қилувчи таъсир кўрсатади. Шу нуқтаи назардан, ҳар қандай жамият тараққиёти унда яшаётган кишиларда шаклланган ижтимоий-маънавий хусусиятлар, яъни субъектив омиллар (онг, билим, маданият, дунёқараш ва ҳоказолар) ривожига боғлиқ.

Субъектив омилларнинг атроф-муҳит ва ижтимоий ҳаётга таъсири характерини эса, инсонлар томонидан бу омилларнинг қай даражада ўзлаштириб билиши, тушуниб англаши, энг муҳими, шу асосда уларни бошқариб, йўналтира олиш имконияти ва қобилияти белгилайди.

Шунга кўра, субъектив омилларни субъект(инсон)ларнинг ўзлари томонидан ўрганиб билиши ва ўзлаштириши, бу - инсонларнинг ўз-ўзини англаши бўлиб, уларнинг шу асосдаги мақсадли фаолиятлари объектив оламни ва ижтимоий борлиқни ўзгартиришда ғоят муҳим, баъзан эса, ҳал қилувчи аҳамият касб этади.

Демак, миллат ижтимоий ҳаётидаги мавжуд маънавий-маданий хусусиятларни (миллий онг, миллий ғурур, миллий маданият, миллий мафкура, миллий ахлоқ, одоб ва ҳ.к.) кишилар томонидан ўзлаштириб, англаниш даражаси (миллий ўзликни англаш) қанчалик юқори бўлса, уларнинг воқеликдаги объектив жараёнларни мақсадга мувофиқ тарзда ўзгартириб бориш имкониятлари шу қадар кўп бўлади.

Халқимизнинг кўп асрлик ижтимоий-тарихий тараққиёти давомида юзага келган ўзига хос маънавияти, маданияти ва қадриятлари **ўзбекчилик**да мужассамлашган. Бинобарин, у минг йиллар давомида шаклланган миллий ўзига хослигимиздир. Демак, ўзбекчилик бизнинг ўзлигимиз - миллий ғуруримиздир. Шундай экан, миллатимизнинг ҳам моддий, ҳам маънавий жиҳатдан ҳар томонлама равнақ этиб, тараққий топиши, миллий ғурурининг шаклланиб, юксалиши ўзбекчиликни кишиларимиз томонидан қанчалик чуқур ўрганилиб, англаниб етилишига ва шу асосда, уни қай даражада ривожланишига боғлиқ.

Шундай қилиб, бизнинг назаримизда, ўзбек халқининг миллийлигини, унинг бутун миллий характер-менталитетини, миллий ғурурини ҳар томонлама билиб, тушуниб олиш учун «ўзбекчилик» тушунчасини илмий-фалсафий жиҳатдан чуқур тадқиқ ва таҳлил этиш зарур. Зеро, тушунчани билиш у ифода қилаётган нарса ёки ҳодисани билиш демакдир.

Гарчи кундалик ҳаётимиздаги ўзаро муомала, сўзлашувларда, турли адабиётларда, оммавий ахборот воситаларида бу тушунча тез-тез ишлатилсада, лекин унинг асл мазмун-моҳияти, турмушимиздаги ўрни ва аҳамияти айтарли ҳеч бир фанда аниқ илмий ёритилмаган.

Шунинг учун бўлса керак, уни ҳар ким ўзича талқин қилади, ҳар хил фикрлар билдиради, ўзига хос нуқтаи назарлардан ёндошади.

Баъзилар ўзбекчиликни миллий менталитетдаги ўзига хос алоҳида хусусиятлар деб билса, бошқалар миллий характер ва турмушимиздаги турли

хил салбий ва ижобий, яхши ва ёмон фазилатлар йиғиндиси тарзида тушунади. Айримлар уни миллийликнинг энг муҳим белгиси деса, ўзгалар шунчаки бир аҳамиятсиз, хонаки тушунча ҳисоблайди. Яна айримлар эса ўзбекчиликни миллатчилик деб тушунишадики, буни назарда тутиб И.А.Каримов шундай дейди: «Ўзбекчилик» деган олижаноб тушунча борки, буни айрим оғзига кучи етмаганлар нотўғри талқин этадилар. Ўзбекчилик - миллатчилик дегани эмас»[3].

Бизнинг фикримизча, *ўзбекчиликда ўзбек халқининг бутун миллий характери ва менталитети: миллий ғурур, миллий онг, миллий маданият, умуман, миллий борлиқ мужассамлашган.* Бинобарин, уни миллатимизга хос барча умумий ва хусусий (ижтимоий ва индувидуал), салбий ва ижобий хусусиятларимизни ифодаловчи (тавсифловчи) тушунча сифатида талқин ва тасвир этиш лозим.

Ўзбекчилик шунчалик ноёб ва ўзига хос тушунчаки, дунёдаги ҳамма халқларда ҳам миллийликнинг бу қадар содда ва лўнда ифодаси учрамайди. Шунинг учун ҳам, И.А.Каримов айтганларидек, «Биз ўзимизни миллат деб билар эканмиз, ўзбекчилигимиз ҳақида аниқ тушунчага эга бўлишимиз керак»[4]. Демак, миллийлигимизни, ўзлигимизни тугал англаб етиш, кўп жиҳатдан, ушбу тушунчанинг мазмун-моҳиятини, ижтимоий ҳаётимизда тутган ўрни ва аҳамиятини нечоғли чуқур билиб олишимизга боғлиқ.

Ўзбекчиликнинг энг муҳим ва ўзига хос томони шундаки, унинг ижтимоий-маънавий асосини миллийлик ва динийлик ташкил қилади. Яъни, ўзбекчилик қадимий ва муътабар миллатимизнинг минглаб йиллар давомида шаклланиб, сайқалланган миллий хусусиятлари билан муқаддас Ислом дини қадриятларининг бирлигидан иборат. Унда дин билан дунёвийлик ўзига хос тарзда уйғунлашган. Донишмандларимиз бизнинг миллатимиз ва миллийлигимизни муқаддас Ислом динидан айри ҳолда асло тасаввур қилиб бўлмаслигини, бу дин қадриятлари, исломий тушунчалар ҳаётимизга жуда чуқур сингиб кетганлиги боис, уларсиз биз ўзлигимизни йўқотишимиз мумкинлигини кўп таъкидлашади. Шунинг учун ҳам, ҳаётимиздаги миллий ва диний қадриятларни ўзаро уйғунликда олиб қарамасдан, ўзбекчиликнинг мазмун-моҳиятини англаб бўлмайди.

Дарҳақиқат, турмушимизда амал қилаётган миллий ва диний қадриятларнинг бирлиги шунчалик табиийлик касб этганки, уларнинг ҳаммасини бир-биридан фарқлаб, қай бири диний ёки миллий эканлигини, ҳатто махсус маълумотли мутахассислар ҳам аниқ айтиб бера олмаса керак. Қолаверса бунга зарурат ҳам сезилмайди.

Шунингдек, ҳозирги даврларда ҳам, ҳаётимизда миллийлик ва динийликнинг табиий уйғунлигини бузишга, уларни ажратиб кўрсатишга ўринишлар йўқ эмас. Хусусан, чет эллардаги ва ўзимиздан чиққан ақидапарастларнинг бугунги халқимиз ҳаётини фақат шариат асосига қурса яхши бўлади, дейишининг ўзи, шунга интилиши динни миллатдан ажратишга, шундай қилиб ўзбекчиликни бузиб, халқимиз миллий ғурурини сўндиришга қаратилган.

Хуллас, *биз учун ўзбекчилик - миллийлик ва динийлик, анъанавийлик ва замонавийликнинг ўзаро уйғунлигидан иборат ўзига хос Шарқона миллий маданиятдир.* Шу боис, у жамиятимизнинг маънавий савиясини, миллатимиз ва миллий ғуруримизни умумий тараққиёт даражасининг муҳим кўрсаткичидир. Шу нуқтаи назардан қараганда, мустақил мамлакатимизда халқимиз миллий ғурурини ривожлантириш борасида амалга оширилаётган кенг кўламли демократик ислоҳотлар, маънавий янгиланиш жараёнларининг самарадорлиги бевосита ўзбекчиликнинг ҳозирги ва келгусидаги ҳолатига, унинг ижтимоий ҳаётимизда тутган ўрни ва ролига боғлиқ.

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СОВРЕМЕННЫЕ ТЕХНОЛОГИИ УПРАВЛЕНИЯ ОРГАНИЗАЦИЕЙ

УДК 334

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ЭФФЕКТИВНАЯ ПОДГОТОВКА ВЫПУСКНИКОВ ВЫСШИХ УЧЕБНЫХ ЗАВЕДЕНИЙ С ЦЕЛЬЮ ИХ БЛАГОПОЛУЧНОГО ТРУДОУСТРОЙСТВА

Аннотация. *В статье рассматривается метод подготовки выпускников высших учебных заведений на основе компетентностного подхода, для реализации которого предлагается методология генерации экосистемы, в которой интегрируются рынок образовательных услуг с рынком работодателей для совместной целенаправленной деятельности по управлению конъюнктурой на рынке труда.*

Ключевые слова: *высшее образование, компетентностный подход, рынок образовательных услуг, рынок труда.*

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EFFECTIVE TRAINING OF GRADUATES OF HIGHER EDUCATIONAL INSTITUTIONS FOR THEIR SUCCESSFUL EMPLOYMENT

Annotation. *The article considers a method of training graduates of higher educational institutions based on a competence-based approach, for the implementation of which a methodology is proposed for the formation of an ecosystem in which the educational services market integrates with the employers' market for joint targeted activities to manage labor market conditions.*

Keywords: *higher education, competence-based approach, educational services market, labor market.*

Введение. Известно, что в период с 1960 и по 90-е годы XX века в США внедрён компетентностный подход в образовании (Competence-Based Education). Следующий этап дальнейшего формирования данного подхода приходится на1970-1990 годы и отличается как теоретическим развитием, так и практической реализацией компетенций в обучении языкам, менеджменте. Таким образом, положено начало классификации компетенций и формирования обучения, в результате которого выпускникам прививаются соответствующие компетенции.

Критерии качества высшего образования в виде набора актуальных компетенций нашли отклик в документах и материалах ЮНЕСКО в 1990-е годы [1-2].

Методы и определения. Стратегия реформирования образования республики включает рекомендации Совещаний министров образования стран – участниц Болонского процесса. Таким образом, предлагаемая обществу образовательная модель предусматривает тесное взаимодействие рынков труда и образовательных услуг, где реализуется принцип *дуальности*, а именно, участие двух сторон - рынка труда и рынка образовательных услуг, что должно быть подкреплено нормативно-правовыми документами, поощряющими совместную деятельность сторон.

За счет цифровизации экономики, организации и совершенствования сотрудничества между вузами и потенциальными работодателями, создания благоприятных условий для развития технологических компаний и стартапов, подготовки высококвалифицированных специалистов, формированию цифрового гражданского общества появляются возможности для повышения качества жизни в стране, повышению уровня занятости повсеместно.

Очевидно, что трудоустройство выпускников высших учебных заведений – это нетривиальная теоретическая и практическая задача и руководство республики нацелено на построение системы высшего образования, отвечающей структурным изменениям на рынке труда, формированию у молодёжи навыков предпринимательской деятельности, интеграции в цифровую экономику.

В условиях академической самостоятельности, в частности предоставленной Андижанскому государственному университету и ряду других вузов республики, предлагается уделить особое внимание роли факультетов, как основной составляющей каждого вуза, с целью устранения неопределённости в решении поставленной задачи повышения востребованности выпускников на рынке труда.

Методология. Наблюдаемые в стране глобальные перемены в системе подготовки специалистов не коснулись способа установления связей и сотрудничества академических сообществ с работодателями, что приводит к отсутствию у выпускников вузов актуальных компетенций и является причиной возникновения расхождений спроса и предложений на рынке труда.

Для решения этой задачи резонно развивать политику взаимодействия потенциальных работодателей и выпускников вузов широкомасштабно на всех уровнях республики посредством внедрения цифровых экосистем для интеграции и синхронного функционирования рынков образовательных услуг и труда, что соответствовало бы государственной политике широкомасштабного экономического развития.

В частности, ранее нами была предложена методология оценки результатов анкетирования работодателей на предмет актуальных компетенций, которая применительно к решению проблемы трудоустройства выпускников вузов позволяет либо сохранить, либо улучшить характеристики системы их подготовки, а также даёт возможность сгенерировать новую систему с заранее определёнными атрибутами. Используемые здесь приёмы и методы предполагают возможность получения различных альтернативных вариаций решений, определить размеры неопределённости по каждой компетенции, оценку её эффективности. Все компетенции выпускников выстраиваются по рангу на приоритетной основе. Система взаимодействия рынка специалистов и рынка работодателей представляет собой совокупность логически связанных элементов: «Цель – Ресурсы - Альтернативы – Средства, направленные на оценивание вопроса решаемости проблемы – Методология генерации новой системы», где цель – это устранение противоречий между выпускниками и работодателями; ресурсы – основанный на научном подходе набор методов решения; альтернативы – вариации решений; средства оценивания решаемости проблемы – наборы компетенций и нормативно - правовых документов; методология генерации новой системы – применение современных компьютерных технологий.

Кроме того, в ранних исследованиях нами был разработан численный метод оценки компетенций выпускников вузов в рамках критериев, обозначенных ранее ЮНЕСКО и была рассмотрена возможность применения геоинформационных технологий (ГИС) в визуализации на административных картах спроса на выпускников высших учебных заведений на рынках труда с возможностью просмотра требований каждого работодателя [3,4].

Таким образом, посредством генерации накопленных знаний, разработанных методов анализа и обработки данных, полученных исследованиями требований работодателей к компетенциям выпускников, проверки соответствия компетенций выпускников обозначенным требованиям формируется методология совершенствования механизма управления системой высшего образования путём создания цифровой экосистемы, интегрирующей образовательный сегмент рынка с сегментом рынка работодателей, позволяющая повысить эффективность подготовки выпускников вузов, повысить их востребованность на рынке труда и тем самым уравновесить конъюнктуру, а так же визуализировать все данные посредством ГИС. Это позволит достигнуть относительного равновесия между уровнями спроса и предложения - конъюнктуры на рынке труда.

Результаты исследований и обсуждение. Остаётся открытым вопрос: какие объективные факторы, помимо соответствия компетенций выпускников требованиям работодателей, влияют на показатель трудоустройства выпускников в настоящее время в условиях рыночной экономики?

Очевидно, что рынок переживает разные времена – времена роста чередуются с временами падения конъюнктуры. Благоприятная конъюнктура наблюдается в условиях экономического подъёма, финансовой стабильности. Что касается времён падения спроса на рынке труда, то это бывает в периоды рецессии, когда наблюдается спад экономической и деловой активности.

Но вместе с тем, конъюнктурный рынок находится в прямой зависимости от показателей промышленного производства, показателя внутреннего товарооборота, показателей во внешней торговле, денежно-кредитного обращения, показателей бюджетной и налоговой сфер, деловой активности населения, ценовых показателей и многого другого.

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