GEOECOLOGICAL CHANGES OCCURRING IN THE NATURAL GEOGRAPHICAL REGION OF MIRZACHOL UNDER THE INFLUENCE OF ANTHROPOGENIC FACTORS

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Abstract. In this article, the causes of changes in landscapes of Mirzachol natural geographical region, human influence on landscapes, negative aspects of agricultural development, correct and rational use of available land and water resources, implementation of cost-effective technologies, and suggestions and recommendations for improving geo-ecological conditions are presented.

Key words: geoecology, ecological situation, natural environment, anthropogenic landscape, anthropogenic pressure, landscape-ecological balance, economic efficiency.

As a result of human development in society and scientific and technical revolution, it was observed that the expansion of landscape complexes caused by anthropogenic activity of man over the past centuries on the surface of the earth has been highly accelerated. As a result of the expansion of settlements, rapid development of agriculture, the increase of arable land, the construction of roads and railways (linear landscapes), the development of the mining industry, natural landscapes were replaced by landscapes created by human hands and intelligence [1 ; pp. 5-18].

As a result of the active action of man, the scale of interaction and interrelationship between society and nature has expanded, various anthropogenic changes have occurred in the process of exchange of matter and energy. At the same time, it was observed that the natural environment is polluted by various household and technical wastes, the atmosphere is poisoned by various substances, and geo-ecological problems dangerous for human life and activity are created. Therefore, the correct and rational use of existing natural resources, the implementation of cost-effective technologies, and the implementation of urgent issues are required.

The geoecological basis of the use of natural resources is of decisive importance. In this regard, organization and implementation of production in ecological balance - ecological situation - ecologically clean technology and products - ecological cleanliness and health systems are of great importance. In this respect, geoecological principles are close to or complement geographical principles, which develop in mutual dependence and communication. In the conditions of the market economy, the use of natural resources should be based on such scientific principles that neither nature nor society should suffer. In the biosphere, while natural components are in balance with each other, between living nature and non-living nature, according to the principle of mutual ecological balance, there is such an equal relationship

between two types of nature in each natural limited area that requires a certain balance between them [5 ; pp. 53-54].

All things in nature, dimensions of phenomena, components of nature are interrelated and dependent and balanced, and have developed steadily over the years on the basis of natural geographical laws. Man, by influencing nature from the outside, continuously affects its stability. As anthropogenic pressure increases, the stability of natural complexes weakens, and after a certain period, a sharp "disruption" occurs, as a result of which the natural relationship changes, the quantity and productivity of natural resources decrease rapidly, and even some species of the organic world disappear [4; 95-96.].

According to A.G. Isachenko, "The purpose of geoecological research is to reveal the geographical laws in the territorial stratification of the natural environment and to comprehensively evaluate the ecological situation of geosystems" [2; p. 33] states that. In order to carry out such work, first of all, comprehensive assessment of geo-ecological situations is carried out by classifying the landscapes of Mirzachol, developing landscape maps, determining the laws of territorial stratification of landscapes, studying the natural and anthropogenic processes taking place in the landscapes. As a result of such studies, the level of diversity of landscapes is maintained and measures are developed to improve geo-ecological conditions. In particular, it is necessary to make effective use of natural resources of the natural geographical region, to enrich it together with the implementation of nature protection while maintaining the comfort level of natural conditions, to maintain the stability of the natural balance between its components, and to study scientific sources.

In the "Nature Protection Map of the Republic of Uzbekistan" published under the scientific guidance of A.A.Rafikov (2003), the following levels of geoecological conditions are distinguished: satisfactory, moderately satisfactory, average, severe and critical. Each of them includes areas with different levels of atmospheric air pollution (according to AII5 – high (7-14), elevated (5-7), low (less than 5)), changes in the quality of surface and underground water, the level of water pollution (very polluted, dirty, polluted, moderately polluted, clean), soil pesticide pollution, soil salinity (strong, medium, weak), soil deflation (strong, medium, weak), vegetation degradation (strong, medium, weak), vegetation cover productivity , cutting of trees and shrubs, the status of vertebrates, population health, levels of landscape change and other qualitative and quantitative criteria were taken as a basis. Natural landscapes were taken as the basis of the ecological map [6.].

The strong anthropogenic influence on the nature of Mirzachol directly caused the landscape-ecological problems in the area, together with the increase in the population and the wide development of the agricultural sector, along with the creation of cultural landscapes. The interaction of natural components in the area is reflected in all the landscapes, which have a unique effect on the climate, surface and underground water, soil, flora and fauna of such unpleasant environmental problems.

Anthropogenic and natural-anthropogenic landscapes have replaced the original natural landscapes as a result of extensive use of the flat and mountainous plains, which make up the main part of Mirzachol, for long-term semi-arid and semi-arid agriculture. Also, the Mirzachol region has favorable natural geographical conditions and agro-economic potential for the large-scale development of agricultural industries, and its nature has been attracted to the economic activities of people from the beginning and is still widely used.

Increasing anthropogenic influence in the Mirzachol region, i.e. not using land and water resources wisely, not paying attention to the melioration of agricultural land, not implementing crop rotation, not using agrotechnical measures, are the reasons for the violation of the ecological balance. Such circumstances led to the development of natural and natural-anthropogenic processes in all landscapes of Mirzachol. The sharp impact of human economic activity has caused the emergence and formation of a number of new types of landscapes, such as agrogenic, hydrogen, urban and rural seliteb, which are still expanding.

The depth of seepage water level and seepage water salinity in Mirzachol's Sirdarya region shows that the land reclamation condition in 2022 at the beginning of the growing season (April 1) was 157,937 thousand hectares or 54.94%. During this period, the area with the salinity of seepage water up to 3 g/l (low salinity) was 117.34 thousand hectares or 40.81%. In Mirzachol, 129.53 thousand ha or 45.05% of irrigated land had a depth of seepage water at a critical point above 2 meters, of which 23.11 thousand ha or 8.03% of irrigated land had a depth of up to 1 meter. 170,132 ha or 59.18% of sea water salinity is higher than 3 g/m (weak, medium and strong salinity). The area with a water depth of less than 2 meters has increased by 53,39 thousand hectares, due to heavy rainfall in March and April, and the level of salinity (above 3 g/liter) has decreased by 20,685 thousand. At the end of the vegetation period (October 1), water less than 2 meters reduced the area by 4,416 thousand hectares, salinity (up to 3 g/liter) increased by 18,042 thousand hectares [3].

The geoecological conditions of Mirzachol were formed and developed in various natural geographical, engineering-geographical conditions. It is located in a low-lying, windy, sunny, flat, sharply continental climate of the Mirzachol mountain intermediate massif, with varying degrees of salinity, water level of 2.0-2.5 m, and low rainfall. The region is characterized by a number of changes and geoecological problems that are taking place under the influence of the anthropogenic factor due to the increase in the population, the management of active agricultural sectors. In particular, problems such as the decrease of the level of groundwater and salinity, the erosion of the fertile soil layer by water, wind and irrigation, soil pollution with pesticides, atmospheric air pollution with dust, salt and other harmful compounds are also encountered in Mirzachol, including:

- Effective use of land and water resources, in order to achieve economic efficiency, first of all, to radically improve land reclamation conditions, to introduce new technologies of moderate water use, to apply agrotechnical and

agromelioration measures;

- The main reasons for the unsatisfactory state of irrigated lands in Mirzachol are the rise in the level of seepage waters and prevention of salinity;

- maintaining the level of salinity of the irrigated lands and soil salinity, taking into account the level of underground seepage waters, their salinity and their movement;

- the surface water level and its salinity are mainly determined by the technical condition of drainage networks and the amount of atmospheric precipitation, the supply of running water during the growing season, and the movement of underground water entering from outside.

By placing vegetable, sugarcane, oilseed, leguminous, food and medicinal crops on newly developed and reused lands in the Mirzachol region, by establishing gardens and vineyards, first of all, salinity-resistant trees, vineyards, tussocks, and pomegranate groves will be established in the peripheral parts of the cultivated areas, underground water salinity will be reduced, and secondly, economic efficiency indicators of districts will increase.

It is necessary to implement the following measures to improve the geo-ecological situation in the Mirzachol region, to make effective use of land and water resources:

Firstly, in order to reduce the effects of toxic chemical compounds used in the cultivation of agricultural land, to increase the productivity of agrolandscapes and improve the quality of cultivated products, the use of mineral fertilizers and pesticides in permitted quantities on irrigated land and cultivated crops, the organization of wide use of organic and local fertilizers, the landscape within agrolandscapes - to stabilize the ecological balance, to reduce the amount of nitrates and pesticides that have accumulated beyond the norm in the soil, to strictly adhere to the system of crop rotation (cotton-grain-alfalfa) in order to establish a mechanism for increasing productivity, to reduce and standardize the amount of toxic chemical compounds used in the cultivation of agro-landscapes .

Secondly, in order to reduce the impact of local winds that have a negative impact on the nature of the environment, the establishment of tree groves that clean the atmospheric air, provide pure oxygen, and permanently improve the climate, use biological and chemical methods to reduce transpiration from the leaves of plants under the influence of winds, and water trees and plants. It is necessary to use modern methods (use methods such as subsoil irrigation, drip and rain irrigation), to strengthen the moving or mobile sands around Tuzkon by means of phytomelioration.

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