SCIENTIFIC METHODOLOGY OF AGRICULTURAL IMPACT ON THE ENVIRONMENT

Kudratova Lobar

PhD student of the Research Institute of Environment and Nature Protection Technologies under the Central Asian University of Environmental and Climate Change Studies (Green University)

Abstract: This study describes the stages of agro-industry development and scientific approaches to its impact on the environment. As a result of the influence of modern science and technology development on the environment, the concept of ecology is expanding, and the scientific methodological bases of the impact of the development of ango-industry on the environment are presented.

Keywords: Agro-industry, agro-industrial enterprises, ecology, green economy, agriculture, animal husbandry.

Introduction. The need for knowledge that explains the relationship between people and the natural environment and the nature of interactions between animate and inanimate nature arose in ancient times. It has been more than 150 years since the science of ecology was born, but it has been developing as a separate science since the second half of the 20th century. American scientist C. Adams (1913) summarized and published information on ecology. In ecology, the organism is seen as a whole system. They interact with the external environment and help each other. Today, ecology is separated from the system of purely biological sciences, and its content is expanding [7].

The impact of modern science and technology development on the environment has expanded the concept of ecology greatly. Man's reaction to the external environment is fundamentally different from that of other living organisms. Since ecology represents the organic connection of living organisms with nature, it undoubtedly forms the scientific basis of nature protection.

Literature review. The development of the science of ecology began with the study and description of nature. These were the times when the Frenchman

Jean-Henri Faber wrote his famous "Entomological Memoirs" (1870-1879). The real development of ecology began with studying the environment in which certain species live, their mutual relations, symbiosis (Greek - living together), and their relations with other species. This is the first period in the development of ecology. Ecological information of the VII-VIII centuries is aimed at studying certain groups of living organisms. In the works of J. Buffon (1707-1778), the issue of the influence of the external environment on the structure of animals was raised. J.B. Lamarck (1774-1829) introduced the first theory of evolution, he believed that the influence of the external environment is the most important factor in the evolutionary changes of plants and animals. Ecological data of the 19th century (A. Humbold) gave rise to a new ecological trend in the geography of plants. In 1859, Ch. Darwin, in his book "On the Origin of Species by Natural Selection", believed that the struggle for existence in nature, i.e., the manifestation of any contradictions between the species and the environment, leads to natural selection and is the driving force of evolution. A.N. Beketov (1825-1902) showed the importance of the internal and external structure of plants, their geographical distribution, and the importance of physiological methods for ecology. In 1877, the German hydrobiologist K. Mebius based his ideas on biocenoses. Phytocenological works of G. F. Morozov, V. V. Olekhin, V. G. Ramensky, A. Shinnikov and foreign scientists F. Kelementes, K. Raunkier, T. Duryong, I. Braun-Blanke and others greatly contributed to the development of general biocenology. that's it. In the development of general ecology, R.N. Kashkarov's lectures at the University of Central Asia called "Environment and Community" later became the first textbook written under the name "Fundamentals of Animal Ecology". M.S. Gilyarov and S.S. Schwarz made a great contribution to the development of the morphological and evolutionary ecology of animals. Classification of life forms of flowering plants was developed by I.S. Serebryakov. In the early 1940s, a new trend emerged in the process of studying natural systems. In 1935, the English scientist A. Tensley put forward the theory of ecosystems, and in 1942, V.N. Sukatyev put

forward the theory of biogeocenoses. At the beginning of 1950, G. Odum, R. Untekker, R. Margalef and others worked on creating the theoretical foundations of biological productivity [9].

Research methodology. D.N. Kashkarov and E.P. Karovin are the founders of ecological work in Uzbekistan. In the 1930s, they published such scientific works as "Environment and Community", "Types of Deserts of Central Asia and Kazakhstan and Prospects for their Use in Agriculture", and "Life in Deserts". Ecology and its tasks and methods are reflected in these works. A laboratory of plant ecology was established at the Institute of Botany of the FA of Uzbekistan under the leadership of B.A. Bigurin. Later, O. Kh. Khasanov, R. S. Wernik and others continued these works. In 1959, the southwestern Kyzylkum desert station, and in 1960 the Nurota semi-desert stations were established, and scientific research of forage plants in ecological, physiological and biological directions was carried out there, and these works are still ongoing. is being done. F.N. Kashkarov made an important contribution to the study of the animal world of Uzbekistan. In 1928, he went to the United States, and for 7 months, he got acquainted with the work of the great ecologists Adams, Shelward, Chapman, Grinnell, Ellie, Taylor, and Forchis. Since 1950, it has been continued by scientists of the Institute of Zoology and Parasitology of the FA of Uzbekistan V.A. Selevin, T.Z. Zohidov, I.I. Kolesnikov. The main direction of research carried out by scientists of the institute is aimed at studying the general laws of the animal world of Uzbekistan. Academicians of FA of Uzbekistan T.Z. Zohidov, A.N. Mukhammadiev, one of the members of the correspondent V.V. Yakhontov, M.A. Sultanov, R.O. Scientists like Olimzhanov contributed to the development of zoological research in Uzbekistan [6].

In particular, it is possible to refer to such works as M.A. Sultonov's "Ecology of Insects" (1963), T.Z. Zohidov's "Biocenoses of Kizilkum deserts" (1971). In the second period of the development of ecological science, the main attention was paid to the study of ecosystems, that is, ecosystems as a functional

whole system. Ecosystems are considered to be interconnected organisms and all elements of the environment in any area. The animate and inanimate elements of nature in ecological systems have their balance and interactions as a whole, and these balances and relationships are closely related to changes in energy and matter. In the third period of its development, the science of ecology is focused on the study of the interaction of ecosystems. The study of mutual relations (connections) of ecological systems has begun. All ecosystems on Earth together make up a single biosphere. The study of the biosphere is the fourth period in the development of ecological science. The biosphere is the environment in which all living organisms and humans live. It consists of a whole of all interrelated ecological systems on earth. The circulation of substances in the biosphere occurs through nutrition. It can be said that in the biosphere, every organism eats each other, and no creature is free from being eaten. In the fifth period of its development, the science of ecology studies the place of man in the biosphere. This period consists of a somewhat completed evolutionary period, which in the scientific sense reproduces man, a harmonious part of the biosphere. Man, together with all other components of the biosphere, has followed an evolutionary path. Also, according to the famous natural scientist L.V. Peredelsky (2006), the development of the science of ecology can be divided into 3 stages: In the first stage, ecology emerges as a science (until the 60s of the XIX century). At this stage, information on the interaction of living organisms with their habitat is collected and preliminary scientific conclusions are made. During this period, J.B. Lamarck (1774-1829) and T. Malthus (1766-1834) first warned mankind about the negative consequences that may occur due to human influence on nature. At the second stage, the period when ecology began to form as an independent science - the end of the 1960s, Russian scientists K.F. Rule (1814-1858), N.A. Seversov (1827-1885), V.V. Scientists such as Dokuchaev (1846-1903) published scientific works based on several concepts and principles of ecology. American ecologist Y. Odum and soil scientist V.V. Dokuchaev (1846-1903) made a significant

contribution to the development of ecology by developing the direction of natural regions, and it is not for nothing that he is considered one of the founders of ecology. In the 70s of the 19th century, the German scientist K. Myobius introduced the concept of "biocenosis" into science, i.e., the laws of harmony and cohabitation of organisms in certain external environmental conditions. Naturalist A. Tensley (1935) put forward the concept of ecosystem. In 1940, the Russian scientist V. N. Sukachev founded the term biogeocenosis, which is close to the concept of ecosystem. In the 20-40s of the 20th century, world-renowned scientists in the field of ecology V.I. Vernadsky, V.N. Sukachev, E.S. Bauer, G.G. Gauze and other dedicated scientists conducted fundamental research: ecology as an independent science was fully formed. The German biologist Ernst Haeckel (1834-1919) was the first to realize that this subject is an independent and most important field of biology and called it ecology. According to his definition, ecology studies the complex interactions between organisms and the external environment. Ecology as an independent science was fully formed at the beginning of the 20th century. During this period, the American scientist C. Adams publishes the first general information on ecology. Russian scientist V. I. Vernadsky (1862-1945) created the theory of the biosphere. American scientist R. McKenzie deals with the issue of human ecology and develops the foundations of social ecology. In the second half of the 20th century, due to the sharp increase in human impact on nature and environmental pollution, ecology becomes especially important. The third stage begins from the 50s of the 20th century until now. At the beginning of this stage, ecology becomes a complex science, which includes knowledge about the protection of the natural environment and the use of nature and incorporates relevant geographical, geological, chemical, physical, economic and socio-cultural concepts.

D.N. Kashkarov and E.P. Karovin are the founders of ecological work in Uzbekistan. At this stage of ecological development, A. Abulkosimov, Z. Akramov, L. Alibekov, P. Baratov, T. Jumaev, K. Zokirov, T. Zohidov, A.

Muzaffarov, A. Muhamadiev, M. Mukhamedjanov, S. Nishonov, A. Uzbek scientists such as Rafikov, M.Rasulov, A.Saidov, Y.Sultonov, M.Umarov, J.Kholmo'minov, Y.Shodimetov, A.Ergashev, P.Gulomov, etc. various aspects have been thoroughly researched. In ancient times, hunting birds for hunters, fish-rich waters for fishermen, and arable land for farmers were important [5].

Research results. As livestock and agriculture developed, the importance of information about nature and the environment also increased, and people learned to evaluate and choose certain places. At first, people cleared land from groves and forests and practised agriculture. An example of this is the history of farming culture that arose on the banks of the Lower Amudarya, Surkhandarya, and Zarafshan rivers. In the long periods of the development of human society, people felt themselves together with nature and considered it to be a place with divine power. Such approach of people to nature, firstly, that nature is a source of housing, clothing and food, and secondly, that natural phenomena and the reasons for their occurrence are not fully understood, arose due to belief in divine power. Since the 50s of the last century in Uzbekistan, due to the rapid growth of industry, transport and agricultural production, as well as the increase in population, land and water resources have been widely and extensively used, which is also harmful to the environment. The effect was shown, and its initial natural state began to change. Especially as a result of agricultural (farming) production, the pollution of atmospheric air, soil and water bodies, and the decline of some species of flora and fauna began to be observed. People began to use nature and its resources on a large scale, but the extent to which changes in the environment bring benefits to nature and society has not been taken into account. Due to agricultural activities, mainly cotton cultivation, the natural environment has deteriorated, and the balance of ecological systems (landscapes) has started to undergo negative changes. Due to national independence in the Republic of Uzbekistan, the real situation in the field of nature and human, social ecology has become clear. It became clear to the world community that there are regions with extremely difficult and unfavourable

environmental conditions in the republic, in particular, the Aral Sea and the Aral Sea. Uzbekistan inherited a very difficult socio-ecological situation from the time of the former Soviet system [4].

Although the main cause of negative changes like Uzbekistan are natural processes, they were caused by the anthropogenic factor - improper management without taking into account the natural ecological laws. The drying up of the Aral Sea is considered to be "one of the most serious environmental disasters in the world". It should be noted that no production is directly connected with nature like agriculture. In the agricultural sector of Uzbekistan, natural and artificial pollution is observed in the conditions of limited usable land, soil salinity and low fertility, erosion of the soil under the influence of water and wind, atmospheric air and water reserves, and in these processes, industrial and agricultural production, household life, transport, machines and mechanisms take a special place and have different effects on some local and regional ecological systems and their natural balance. The fact that great changes and updates are taking place in the natural and social environment of Uzbekistan, production based on the latest ecological technologies is emerging, and the nature of the republic, and its natural and anthropogenic landscapes are becoming more attractive every day. creates a feeling of pride in the heart of the citizen.

Conclusion. Today, society's interaction with nature is becoming more and more complicated, and ensuring environmental safety in the "man-nature-economy-environment" system is becoming a multi-factor process. Environmental security is the highest biosocial value - the state of protection of life of people and living creatures in nature. This is, first of all, a matter of ensuring sustainable development by introducing waste-free, low-cost and environmentally friendly technologies, developing the ecological foundations and economic mechanisms of environmental protection, taking measures against environmental violations, and forming environmental knowledge and thinking among citizens. , they have

become the most urgent practical tasks of general ecology and environmental protection activities.

REFERENCES

1. Law of the Republic of Uzbekistan "Land Code". - T.: "Adolat", 1998.
2. Law of the Republic of Uzbekistan No. ORQ 409 of September 21, 2016 "On the protection and use of flora" of the Republic of Uzbekistan
3. Decree No. PF-5024 of the President of the Republic of Uzbekistan "On improving the state management system in the field of ecology and environmental protection" signed on April 21, 2017. www.lex.uz
4. Information from the Ministry of Agriculture of the Republic of Uzbekistan.
5. Avazov Sh.M. Ecology and environmental protection. - T.: ILMZIYO, 2013.
6. Alikhanov B. Ecological review of Uzbekistan. - T., 2008.
7. Ergashev A. General ecology. - T., 2003. 308
8. Otaboyev SH., Nabiev M. Man and biosphere. - T.: "Teacher", 1997.
9. Latipov, N. (2022). Shaharlar va ularning ekologik muhit bilan bog'liqligi. Scienceweb academic papers collection.
10. Latipov, N. (2022). УРБОЭКОЛОГИЯ-ГЕОГРАФИЯ ВА ЭКОЛОГИЯНИНГ ФАНЛАРАРО СИНТЕЗИ. Scienceweb academic papers collection.
11. Komilova, N. K., & Latipov, N. F. (2022). Analysis of existing methodological approaches in assessing the quality of the environmental condition of cities. Экономика и социум, (12-1 (103)), 161-165.
12. Latipov, N. F., & Komilova, N. K. (2022). INDICATORS OF URBAN ENVIRONMENT ASSESSMENT AND CRITERIA FOR THEIR SELECTION. Экономика и социум, (11-1 (102)), 129-134.
13. Komilova, N. K., & Latipov, N. F. (2022). FACTORS AFFECTING THE ECOLOGICAL STATUS OF INDUSTRIALIZED CITIES AND MEASURES TO MONITOR THEM (ON THE EXAMPLE OF NAVOI REGION). Экономика и социум, (2-2 (93)), 199-206.
14. Latipov, N. F. (2024). THE PROCESS OF URBANIZATION AND ITS CORRELATION WITH THE ECOLOGICAL CIRCUMSTANCE. Science and innovation, 3(Special Issue 4), 343-352.