Evolution of Ideas about the Role of the Environmental Factor in socio-Economic Development

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Abstract. The article presents an analysis of alternative theories of ecological and economic development. The authors formulate the role of the environmental factor in socio-economic development, taking into account the ideas of alternative economic schools and trends. The paper analyzes the problems of preserving the environment as the basis of human life. This takes into account the nature of the impact of anthropogenic pressure on natural complexes and objects, due to increased consumption, excessive withdrawal of renewable natural resources that exceed the rate of natural recovery, a reduction in the reserves of non-renewable natural resources, as well as an increase in the population. At the same time, the article focuses on the problems of sustainable, balanced, harmonious development of production and social systems.

1 Introduction

The existence of a range of problems related to the environment, but which are within the competence of the economy, predetermined the formation and development of a separate direction in economic science. Ecological economics (environmental economics) is not an alternative to the traditional directions of economic theory, but only expands the prospect of using the tools of economic analysis. Recently, many publications have appeared that deal with the global environmental crisis, the impending environmental catastrophe, the ecological choice of humanity, etc.

The modern economics of environmental management still does not define what ecology is as a subject for economic analysis, for economic planning, and then for economic regulation, so that economic means can influence the environmental situation. In the Russian literature, the terminology in this area is still not fully formed; research projects, as a rule, do not go beyond the detailed consideration and detailed description of environmental problems, since the goal of the authors of scientific works is to find effective ways to reduce or completely eliminate the negative anthropogenic impact on the environment. Researchers prove the existence of mutual conditionality of " economy "and" ecology", but they traditionally consider nature exogenously - as the external environment within and through which the economy functions. But this is the same as if a person within the boundaries of the subject of economic theory is represented as an external subject, without which the economy cannot exist. Economics shares a common human element with ecology. And, if the economy exists today in relation to ecology as an alternative, then the explanation for this should be sought in man, in his social nature, in the socio-institutional structure of society.

Meanwhile, among economists, the dominant approach is based on the study of the relationship between people about environmental benefits, and the relationship of man to nature. The economic analysis of ecology in this case does not have its own content, in the absence of a well-developed and generally accepted theoretical definition, "ecology" is understood as a variety of fields of study. Let us distinguish two main trends in the conceptualization of nature: 1) a phenomenon that is threatened (anxiety about endangered species, the perception of nature as a set of limited resources that need to be saved for future generations); 2) the concept of nature as a source of purity and moral strength, a holistic ecosystem that needs to be preserved in all its diversity and interdependence.

In the same few works that are devoted to the search for an economic solutions to environmental problems, environmental aspects dominate over national economic ones, environmental protection is characterized in detail, and other issues of the development of the national economy are presented in the abstract, only as a polygon for the study of environmental management, and often in a simplified form.

2 Materials and methods

One of the fundamental problems of the development of modern society is the need to preserve the environment as the basis of human life. At the same time, it is necessary to take into account the nature of the impact of

anthropogenic pressure on natural complexes and objects, due to increased consumption, excessive withdrawal of renewable natural resources exceeding the rate of natural recovery, a reduction in the reserves of non-renewable natural resources, as well as an increase in the population. The result of these processes is the activation of environmental destructions associated with the depletion of the components of the natural resource potential, the violation of the ecological balance of landscape complexes and other systems, as well as with an increase in the level of atmospheric pollution, which, in general, led to an aggravation of the environmental crisis situation.

It should be noted that within the framework of modern ecological and economic theories, various scientific schools have been formed, whose scientists study the problems of sustainable, balanced, harmonious development of production and social systems. Thus, the scientific works of S. K. Kharchikov , B. V. Burkinsky, I. V. Berezhnaya, A.D. Krisilov and others are devoted to the problems of ensuring the balance of social, environmental and economic systems. In the context of minimizing the negative impact of human activity on the environment, it is necessary to consider the scientific works of T. P. Galushkina, N. N. Andreeva, N. G. Kovaleva, et al. The sectoral aspect of ecological and economic relations is reflected in the works of M. T. Meleshkin, V. N. Stepanov , V. M. Tregobchuk, and others.

At the same time, theoretical and methodological approaches to the study of the problems of the development of the socio-ecological and economic system in the conditions of techno-genesis require improvement, which is due to the growth of production and consumption, the increased impact of economic activity on natural complexes and objects. This will allow us to develop a mechanism for regulating socio-ecological and economic relations, taking into account the nature of environmental destruction, the degree of anthropogenic impact on the natural environment, the quality of life and the level of economic development of society.

Initially, the essence of the definition "ecological system" was defined by A. D. Tensley as a specific category, which is a set of biomes, including a complex of organisms, which are considered together with all the active inorganic environmental factors. In the development of this approach, V. N. Sukachev proposed to consider the concept of biogeocenosis, which is understood as a spatially defined natural unity, within which vegetation, fauna, microorganisms, soil and atmosphere are interconnected and interact with each other.

N. F. Reimers noted that " the broad interrelation of material-energy and informational ecological components (energy, water, gases, substrates with their physical and chemical properties, producer organisms, consults and reducers, as well as information), which is formed in neighboring functionally conjugated elementary ecosystems (biogeocenoses), creates biogeocenostic complexes, and the small circles of biogeocenotic metabolism themselves form biogeocenoses, or elementary ecosystems, based on the relative homogeneity of the territory."

Yu. Odum considered an ecosystem "as a unit of biological organization composed of all the organisms in a given area (that is, a 'community') that interact with the physical factors of the environment so that the flow of energy controls the parameters of the trophic structure and the circulation of substances within the system." The scientific work proves that the ecological system is "a set of organisms and their living conditions, which are closely interrelated with each other and create a system of mutually dependent processes and phenomena."

It should be noted that the proposed approaches focus more on defining the essence of an ecological system as a biological community, the elements of which interact with each other within a certain space. However, the development of technological progress, together with positive trends, is associated with an increase in the anthropogenic load on the environment and ecological systems, as an element of the biosphere.

The means of active influence on the ecological system is, first of all, production activities, the products of which, being components of this system, transform its structure. Thus, the result of the activation of industrial production is the creation of material goods, the improvement of human living conditions, which, first of all, is associated with an increase in the consumption of non-renewable natural resources and, as a result, is the cause of the imbalance of the ecological system. Therefore, within the framework of ecological and economic theories, the problems of interaction between the economy and the natural environment are actively discussed. Thus, M. T. Meleshkin considers the relationship of human economic activity with the environment in the system "economy-environment" and for the first time proposes to define the definition of "economic system" as a set of economic, environmental, social and political components that interact with each other.

M. Y. Lemeshev believes that the ecological and economic system is the result of the integration of the economy and nature, which is an interconnected and mutually dependent functioning of social production and natural processes in the environment, in particular in the biosphere. In our opinion, M. Y. Lemeshev focuses on a single complex process of functioning of the economy and the natural environment, which is due to their mutual penetration as a result of interaction.

N. N. Moiseev defines the ecological and economic system as "a part of the noosphere limited by a certain territory, in which natural, social and industrial structures and processes are interconnected by interacting flows of matter, energy and information". In this case, the functioning of the ecological, economic and social components is analyzed, as components of the sphere of interaction between society and nature, within the boundaries of which human activity becomes the determining factor of development.

E. A. Kalenskaya suggests that the ecological and economic system should be understood as the interdependent functioning of ecological and economic systems limited by a certain territory, forming an integral

system with emergent properties, the elements of which are connected by material, financial and energy flows. According to this approach, ecological and economic systems can be considered open, since their functioning is influenced by various factors that are formed both inside the system and outside it. The open nature of the functioning of the system determines the level of its stability, since the number of connections between the elements, as well as the number of elements, of the system ensure its stability. Stability in this case refers to the ability of a dynamic system to adapt to changing environmental conditions, that is, to maintain the ability to move along the intended trajectory, under the influence of external factors. The ability of the system to maintain movement along the intended trajectory is provided by the availability of alternative ways to exchange information when one of the species disappears. In view of the fact that there is a view that the disappearance of some species and the emergence of others, more adapted to changing conditions of existence, is a normal process of evolution.

So, it is important to increase the number of connections both within the system and between systems of different ranks, in order to ensure the exchange of material, financial and energy flows through alternative connections, in the event of the disappearance of one of the types of this system.

Yu. D. Dmitrievsky considers the relationship between the environment and society within the geosystem, which includes the triad "nature – population – economy". Under the influence of anthropogenic and technogenic influence on the natural environment, geosystems are transformed into natural-anthropogenic geosystems, the state of which is determined by the interaction of the constituent subsystems: the biosphere, the geosphere and the socio-sphere.

According to the authors, the basis for considering a single system consisting of social, environmental and economic subsystems is the presence of common properties that are inherent in all systems. These include: the presence of a certain structure, the necessary diversity, the predominance of internal interactions in the system over external ones and the lability of the system in relation to external influences, emergence, as the degree of non-reducibility of the properties of the system to the properties of the individual elements of which it consists, which is manifested in specific properties and elements characteristic of the entire system, which are a consequence of the impact of human activities on ecological systems. The ecological system refers to the natural and includes a biological community, including a person, whose elements interact with each other within a certain space, the economic system – to the artificial, which includes the economic activities of society to ensure material well-being, the social system represents the life and activities of society. In turn, in the ecological and economic system, part of the material elements of the ecological system, including the human habitat, is used as a resource for the functioning of the economic system. Thus, it is possible to note that the main element and driving force in these systems is a person. It is also necessary to take into account the fact that the boundary between the systems is conditional, since the sphere of life support for people belongs to all three subsystems. At the same time, the social subsystem should be considered as an object of management, the environmental – as a constraint, and the economic-as a tool.

3 Results and discussions

Thus, social, ecological, and economic systems are relatively independent, developing according to their own laws, but in the process of their interaction, specific relationships arise, which, on the one hand, reflect the influence of natural elements and the laws of nature development on humans, and on the other hand, characterize the relationship between economic, environmental, and social actors in the context of increasing the impact of economic activities on the natural environment. In this regard, scientists note that the functioning of socio-ecological and economic systems under the influence of man-made factors is characterized by the processes of stagnation, stagflation, degradation, development and strengthening of environmental destruction. From the point of view of studying the problems of functioning of systems, it is relevant to consider them in various situations, especially given the significant influence of technogenic factors on their functioning and the degree of environmental destruction.

Thus, the socio-ecological-economic system should be understood as a complex dynamic system that is transformed in the course of interaction between various social entities, ecological systems, through the impact of the results of economic activity within a certain territory.

As a result of the functioning of the socio-ecological-economic system within a certain territory, complex processes of interaction between systems of various ranks, as well as external influences, occur, as a result of which these systems are transformed. Traditionally, scientists propose to distinguish two groups of factors under the influence of which the ecological system is transformed.

The factors of the first group are those that arise as a result of natural processes, including earthquakes and other seismic phenomena, floods, dust storms, mudslides, landslides, extreme climatic events, etc.

The second group consists of factors caused by the impact of human activities, such as pollution of the natural environment, including the oceans and outer space, accidents at industrial facilities, the greenhouse effect, the effect of ozone holes, the reduction of biological diversity and the genetic fund, the accumulation of toxic, radioactive and other environmentally hazardous waste. The second group of factors in the scientific literature is usually called technogenic.

For the first time, the essence of the definition of "techno-genesis" was defined by V. I. Vernadsky as a theoretical basis for the rational use of natural resources, nature protection and combating environmental degradation. V. I. Vernadsky identified a new system in

the geographical shell - the noosphere, the main feature of which is technogenic migration (techno-genesis), which is characterized by the movement of chemical elements and substances, which is caused by industrial and agricultural human activity. Thus, the main driving force of the development of the noosphere is the results of human activity.

A. E. Fersman proposed approaches in which he justified the need to assess the impact of human activity on the environment, taking into account the characteristics of chemical elements.

N. F. Reimers defines techno-genesis as the process of changing natural complexes under the influence of human production activity, which consists in the transformation of the biosphere under the influence of a set of geochemical processes associated with the technical and technological activities of people to extract from the environment, concentration and rearrangement of a number of chemical elements, their mineral and organic compounds.

4 Conclusion

Ecology as the science of the impact of the environment on the behavior of living organisms has emerged and is developing in the system of biological sciences. There is also environmental engineering. Rather, it is not a single science, but a complex of theoretical and applied disciplines that develop a certain set of algorithms that allow for the design, construction and operation of production systems to take into account the environmental limitations of the functioning of the objects being created.

It is the particular path that ecology has taken as a field of scientific knowledge from its inception to the present day that, in our opinion, has largely determined the prevailing ideas of economists about ecology. In fact, ecology has come to be understood not as a science, but as a field of activity devoted to the problems of human and social relations with the environment.

It is necessary to consider eco-innovations in relation to technological innovations in the context of the problem of sustainable development, which involves the increment of economic, social and environmental value.

Awareness of the consequences of environmental pollution and the threat of disruption of global sustainability as a result of progressive population growth formed the basis for the formation of the concept of environmentally sustainable development. The essence of the change, according to B. Commoner, is that the problems of the environmental crisis are not a tribute to the fashion for a new lifestyle, nor a means of distracting attention from the main economic, social and political conflicts. On the contrary, environmental issues have helped to get to the heart of the things that bother the world. Negative environmental impacts could cause global food prices to rise in the coming decades and increase the volatility of prices for all natural raw materials, which would dramatically worsen the situation of the poor citizens.

The category ecology has become widely used in the context of socio-economic problems, such as economic growth, living standards, etc. The content of the concept of "ecology" has been transformed and exists in two meanings: as a biological science and as a complex integral direction that combines the fields of knowledge of natural, social, and engineering sciences. The material field of ecology in its expanded sense is nature and society - ecology covers almost all areas of knowledge or the vast majority of them. Each branch of knowledge about nature (biology, physics, chemistry, Earth sciences) or society (biomedical sciences, social sciences) has a specific categorical apparatus, the level of development of semantic structures, and its own pragmatic value.

"Sustainable development can be a source of opportunity, innovation, and even competitive advantage. "

References

1. N.N. Andreeva, S.K. Kharchikova, *Resource and environmental safety of the enterprise, Diagnostics, strategy, regulation* (Odessa: IPREEI NASU, 1996, 90)
2. G.V. Balabanov, V.P. Nagirno, O.M. Lizhnik, Transformation of the structure of the Ukrainian state: regional aspect (K.: "Milenium", 2003, 403)
3. V.S. Tarasenko, I.V. Berezhnaya, *Expert assessment of the sustainability of the ecological-socio-economic system of the ARC, individual economic regions, rural and settlement communities*, Crimea in the parameters of sustainable development : a scientific publication, Crimean Academy of Sciences, Crimean Republican Association "Ecology and Peace" (Simferopol: "Original-M", 2008, 98-140)
4. B.V. Burkinsky, N.G. Kovaleva, *Ecologization of regional development policy* (Odessa: IPREEI NAS of Ukraine, 2002, 328)
5. T.P. Galushkina, S.K. Kharchikov, *Environmental management in Ukraine: realities and prospects* (Odessa: IPREEI NASU, 1998, 107)
6. A.E. Fersman, *Selected works 1952-1962 (Materials for the bibliography of CCCP scientists, cep. geol. nauk, v. 19)* (M.: Nedra, 1964, 575)
7. O.O. Kalenka, Ekologo-ekonomichna sistema: viznachennya, struktura, vzaimodii, Visnik SumDU, **1**, 83-84 (2007)
8. M.Ya. Lemeshev, *Ekologo-ekonomicheskaya modeli prirodopolzovaniya, Comprehensive analysis of the natural environment* (L.: Gidrometeoizdat, 1976, 266-276)
9. I.M. Litsur, *Teoretiko-metodologichnoi osnovi ekologo-ekonomichnoi bezpeki (na prikladi lisovikh resursiv Karpat): monogr.* (K.: Nauk. svit, 2004, 139)

10. M.T. Meleshkin, A. Zaitsev, H. Marinov, *Economy and Environment, Interaction and management* (M.: Ekonomika, 1979, 270)
11. M.T. Melishkin, *Ekonologicheskie problemy Mirovogo okeana* (M.: Ekonomika, 1981, 280)
12. E.A. Mikhurinskaya, S.A. Shinkarchuk, Us Bases of research of socio-ecological and economic systems in the conditions of technogenesis, Economics and Management, **2**, 70-76 (2013)
13. N.N. Moiseev, Nauka, global prospects of mankind, Horizons of ecological knowledge, **1-2**, 179-200 (1986)
14. B.V. Burkinsky, V.I. Stepanov, S.K. Kharchikov, A.D. Krisilov, Scientific bases of formation of the concept of sustainable development of the region: New ideas and solutions (Odessa: IPREEI NASU, 1996, 42)
15. N.F. Reimers, Ecology (theories, laws, rules, principles and hypotheses) (Young Russia, 1994-367)
16. B.V. Burkinsky, V.N. Stepanov, L.L. Kruglyakova, S.K. Kharchikov, et all, *Resource and environmental safety, Theoretical and applied aspects* (Odessa: UMAOI "Consulting", 1998, 180)
17. G.S. Rosenberg, *Anthology of ecology* (Tolyatti: IEVB RAS, 2004, 394)
18. N.F. Reimers, *Ecology (theories, laws, rules, principles and hypotheses)* (Young Russia, 1994-367)
19. V.M. Tregobchuk, M.A. Khvesik, Water management and environmental problems and ways of their complex resolution, Economy of Ukraine, **1**, 32-42 (1996)
20. V.N. Steanov, B.V. Burkinsky, L.L. Kruglyakova, E.N. Gromova, V.F. Goryachuk, *Formation of a new ecological and economic policy for the development of the Black Sea* (Odessa: IPREEI NAS of Ukraine, 1995, 61)
21. S.K. Kharchikov, N.N. Andreeva, L.E. Kupinets, *Economy and Ecology: compatibility of development (world experience and Ukrainian perspective)* (Odessa: IPREEI NAS of Ukraine, 2007, 180)
22. V. Shlychkov, A.S. Khasanova, I.K. Kiyamov, S.M. Kulish, R.V. Nestulaeva, Practical management: theoretical and methodological approaches and Russian practice of state and municipal management, **20 (2B)**, 200-223 (2017)
23. A. Khasanova, E. Dotsenko, N. Ezdina, M. Khasanov, Multi-aspect impact of eco-innovations (sustainable goods) as a form of development of the innovative potential of the region, Web-E3S successful conferences, **220**, 01004 (2020)
24. E. Dotsenko, S. Mudrova, N. Ezdina Ecologization of Regional Industrial Complex in the Transition to Sustainable Development E3S Web of Conferences 41, 04050 (2018)