ENVIRONMENTAL AND ECONOMIC SECURITY IN THE CONDITIONS OF DIGITALIZATION OF THE UKRAINE`S ECONOMY

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Abstract: The article examines the peculiarities and modern specifics of the formation of ecological and economic security in Ukraine in the conditions of digitalization. It was determined that the lack of dynamic growth, the violation of the optimal balance and balance of the ecological and economic system are caused by the depletion of raw resources, a decrease in the overall potential of the environment, and the irrational use of natural resources. It has been proven that in the conditions of digitalization, a new challenge for all enterprises is to ensure the ecological and economic efficiency of their activities, which combines the principles of transparency and openness in their functioning. It has been proven that the strategy of environmentally-oriented economic development should be aimed at solving environmental problems and preserving biological diversity.

Keywords: Digitalization, Ecological and economic security, Ecological and economic system, Rational use of natural resources, Strategy of ecologically oriented economic development.

1 Introduction

Features of the formation of integrated security systems of the state involve the combination of its individual key elements into interconnected functional formations, which are designed to respond to certain types of threats or risks. In this aspect, ecological and economic security is extremely important, as a key element of stimulating the development of the national economy on the basis of sustainable development, which is designed to ensure intensive economic growth under the condition of harmonious use of natural resources in the production process. The importance of ensuring an appropriate level of ecological and economic security is due to the general deterioration of the ecological quality of the environment, which has been observed recently in Ukraine and which is caused by a significant increase in the anthropogenic and technogenic load on the environment, which requires the formation of resource-ecological security of economic activity in the national economy.

At the same time, environmental and economic security is the most important condition for stability and achieving effective results for individual enterprises, the state, and society as a whole. The priority task of ensuring ecological and economic security in modern conditions is the prediction of challenges and threats, for the prospect of which it is necessary to prepare today. At the same time, one of the most important global challenges today is general digitalization, which has a direct impact on the ecological and economic security of the state. After all, the rapid development of this field is a source of previously unknown risks and threats, which, accordingly, requires the development of new principles and measures for their minimization and elimination. At the same time, the general transformation of approaches to the management of ecological and economic security in the conditions of the formation of the digital economy requires the formation of fundamentally new approaches to risk management for the nature management system.

In addition, in the conditions of digitalization, the need to ensure the openness of information regarding the organization of environmentally responsible business, the implementation of innovations, etc., is growing. All this determines the investment attractiveness of enterprises and has an impact on the growth of their market value. That is why the problems of ensuring ecological and economic security in the conditions of the development of a global network of economic and social processes are becoming more and more urgent. At the same time, new management principles in the conditions of the digital economy should contribute to the neutralization of threats to the ecological and economic security of the state in general.

2 Literature Review

Peculiarities in the study of practical problems of the formation of ecological and economic security are not new to modern economic science and are sufficiently widely disclosed in works related to the study of the efficiency of the economy of nature use. This issue is considered most fully in the works of such scientists and practitioners as O. Agres [1], I. Balaniuk [3], A. Boiar [5], Y. Chaliuk [6], V. Gobela [16], O. Liakhovych [18], O. Shkuratov [23], T. Shmatkovska [24-27], R. Sodoma [30-33], O. Stashchuk [35-37], V. Yakubiv [40], Ya. Yanyshyn [42], A. Zamula [44] and others. In addition, it is necessary to note the significant contribution that was made to the study of ecological and economic security issues in the context of the formation of the digital economy and the general digitalization of the system of ecological and economic relations, which are highlighted in the studies of such scientists as O. Apostolyuk [2], O. Binert [4], M. Dziamulych [7-15], M. Horobey [17], M. Melnyk [19], N. Popadynets [20-22], O. Shubalyi [28-29], M. Soldak [34], S. Yaheliuk [38], I. Yakoviyk [39], A. Yakymchuk [41], O. Yatsukh [43] and many others.

However, the large-scale use of modern digital technologies leads to the intensification of the processes of formation and further development of industrial ecosystems as stable geographically defined networks of interconnected diverse enterprises and institutions based on certain production technologies. This is what requires additional research in the field of environmental and economic security formation in the conditions of digitalization of the system of economic relations.

3 Materials and Methods

It should be noted that threats to ecological and economic security in the aspect of intensive use of digital technologies arose simultaneously with the emergence of the information space. Today, digital threats relate to almost all systemic components of environmental and economic security.

Modern research makes it possible to group digital threats characteristic of the ecological and economic security system into five basic blocks:

1. Systemic – threats affecting the economy or its significant parts (dependence on digital technologies of other states, lack of own elemental base, the problem of “digital inequality” of the ecological component of the national economy).
2. Structural – a consequence of the large-scale implementation of digital technologies.
3. Sectoral – lack of digital solutions for individual sectors when solving urgent issues of nature management.
4. Entrepreneurial – formed in the entrepreneurial sector from external and internal sources.
5. Personal – formed at the level of individual citizens when consuming goods that must meet certain environmental safety requirements [18].

In addition, the economic mechanism of nature management is a

subsystem that supports the structural features and functional connections of the national management mechanism. However, this mechanism has its own content and constituent elements based on its own principles and has specific forms of manifestation and functions. Therefore, the economic mechanism of nature management should be considered as a system containing the following components:

- Payment for nature use;
- Economic stimulation of environmental protection activities;
- Payment for environmental pollution;
- creating a natural resources market;
- Improvement of the pricing system, taking into account the environmental factor;
- Environmental funds;
- Environmental programs;
- Environmental insurance;
- Sale of pollution rights [16].

4 Results and Discussion

Changes in the ecological and economic system of the national economy of Ukraine over the past decades have shown the presence of serious ecological and economic contradictions. Its further progressive development requires taking immediate measures to preserve the balance of economic, natural, and human resources. The lack of dynamic growth and the violation of the optimal balance and balance of the ecological and economic system are primarily caused by the depletion of raw materials, the decrease in the assimilation potential of the environment, and the irrational use of natural resources. The specified influencing factors encourage producers and consumers to search for more effective, innovative production and consumption models. In the conditions of the formation of the digital economy and the reorientation of the ecological and economic system on the basis of sustainable development, the key task is the formation and justification of the strategy for ensuring ecologically oriented development. Unfortunately, at present, there is no unity in theoretical approaches to the formation of the foundations of sustainable development, which does not contribute to the formation and implementation of the strategy of ecologically oriented development of the national economy.

The problems of the natural environment affect the life of the country as a decisive factor or as a component of national well-being and potential opportunities for the state. As a result, national and international security is impossible without taking into account the environmental factor. From the perspective of a global approach to security, any aspect that threatens the survival of the planet and its nature must be considered a security threat. The pace of global change is much higher than scientists previously predicted. If these processes remain unchecked, they will become irreversible. It is also worth noting that environmental problems are problems of completely new dimensions. In addition, the difference in levels of economic development affects the ability to protect against environmental threats, and environmental degradation affects economic development, weakening its potential. According to UN experts, environmental losses due to pollution exceed the cost of measures aimed at combating it. In developing countries, they are much more than in developed countries. Every year, 0.5 to 2.5% of GDP is lost due to pollution, and the cost of measures that would allow for a radical reduction of pollution in industrialized countries is 1-2% of GDP. After all, environmental threats cannot be clearly defined in terms of cause and effect, but they are quite closely related to each other and other social, political, and economic factors that also affect the state of security [44].

At the same time, in the conditions of digitalization, a new challenge for all enterprises is to ensure the ecological and economic efficiency of their activities, which combines the principles of transparency and openness in their functioning. At the same time, it is worth noting that the openness of information regarding the environmental aspects of business organization, the implementation of environmental innovations and social activities is a criterion of the corporate management culture of an enterprise, which, if properly provided, creates the prerequisites for strengthening its competitive position on the market, as well as determines investment attractiveness and the growth of market value enterprises [18].

Recently, in the context of the formation of ecological and economic security, there is talk of intensification of the processes of formation of the development of industrial ecosystems. At the same time, the modern smart industry is much more than isolated enterprises and the products that are created on them, because it is based on integrated digital networks in which production chains are interconnected with researchers and developers, suppliers, creditors, distributors, consumers through the latest information and communication technologies. Thanks to this, industrial ecosystems are formed, which improve coordination and increase the degree of active participation of all partners both in individual chains and in complete networks of value creation. As M. Soldak notes, the centres of such ecosystems are located in a certain geographical space and intensively interact with the environment. That is, the concept of “industrial ecosystem” carries a double meaning. First, it is a stable network of interconnected multifaceted enterprises and institutions, based on appropriate production technologies, so that different degrees of development of dominant technologies correspond to industrial ecosystems of different degrees of development. Secondly, it is an analogue of a biological ecosystem, which consists of economic entities, the environment of their functioning, and a system of connections, thanks to which the exchange of substances and energy between them is carried out, more or less intensively, with greater or lesser consequences for the environment [34].

At the same time, it is necessary to take into account that the ecological sphere of the ecological and economic system includes such factors as the quality of food, drinking water, air, informational contact with natural systems, rational use of nature, preservation of biological and landscape diversity, etc., then ecological oriented development contributes to the establishment of optimal parameters of the ecological and economic system, which do not threaten its integrity and create opportunities for dynamic development and establishing a balance between the needs of society and the limitations of the natural environment. Such development should ensure the preservation of the assimilation potential of the natural environment for the present and future generations of mankind. And it is on such a basis that the digitalization of the ecological and economic security system should be implemented.

A significant range of nature management problems are solved during digitalization: collection and storage of data on the state of environmental components mainly on paper media and in non-standardized digital formats (for example, at the moment there is a very large base of protection obligations that have not yet been transferred to electronic media); lack of uniform standards for the collection and exchange of digital information within the industry; low awareness of citizens about the quality of the environment and measures taken by the executive authorities to reduce the negative impact on the environment; a small number of domestic technical and software solutions for assessing the anthropogenic load on the environment, forecasting the spread of pollution in various natural environments, reducing emissions into the atmosphere.

In this way, the following challenges to environmental and economic safety during the use of modern digital tools can be noted:

1. Application of requirements to production processes aimed at climate change prevention, environmental protection, and preservation of the biosphere.
2. Minimization of the growing anthropogenic load on the environment (the increase in the number of motor vehicles, the increase in the amount of production and consumption

waste generation at a low level of their disposal, a significant number of objects of accumulated damage to the environment, a high level of pollution and low water quality of a large part of water bodies, etc.), which leads to the degradation of natural objects.
3. Significant increase in the level of environmental education and environmental culture of the population.
4. Quality improvement and automation of interaction between state authorities and the public [17].

Accordingly, these challenges form a number of strategic risks, among which the most significant are:

1. Inadequacy of the level of knowledge of personnel potential in the environmental field with the new requirements of digital transformation (low digital competencies).
2. High cost and, accordingly, the duration of implementation of significant environmental and digital projects.

The new industrial strategy for Europe, which aims to ensure the transition of European industrial ecosystems to climate neutrality and digital leadership, contributes to the solution of the task of creating a more ecologically clean and waste-free industry, which must be competitive on the world stage. Three driving factors defined by the European Commission should contribute to its achievement:

- "Green" transition, according to which the basis of the new growth strategy – the European Green Deal – is Europe`s aspiration to become the world`s first climate-neutral continent by 2050;
- Global competitiveness, for which it is supposed to create the necessary conditions for entrepreneurs to turn their ideas into products and services, and for companies of any size to achieve prosperity and growth;
- Digital transition, when digital technologies change the face of the industry and the way of doing business, allow economic players to be more active, teach workers new skills and support the decarbonisation of the economy [34].

In our opinion, in the context of the inevitable European integration of Ukraine, there are now objective prerequisites for the construction of such a system of ecological and economic security, which would be oriented precisely on the principles of the European Union regarding the construction of an ecologically safe economy. Moreover, if in the future there is a need to integrate the national economy of Ukraine into the economic system of the EU, then the presence of a policy of conducting ecologically safe management at all levels, formed in accordance with European principles, will allow this stage to pass as quickly and without problems as possible.

5 Conclusion

Thus, we come to the conclusion that the strategy of ecologically-oriented economic development should be aimed primarily at solving environmental problems: preservation of biological diversity, the greening of cities, effective and rational use of natural resources, and creation of conditions for their restoration, implementation and distribution environmental education of citizens, the formation of a value orientation of humanity aimed at caring for the natural environment. The development and implementation of such a strategy will provide an opportunity to solve existing environmental problems and contradictions in Ukraine, as well as to ensure intensive and safe economic growth. The main goal of the strategy should be the balanced coexistence of the natural environment and society on the basis of the ecologically oriented economic policy of the state. In Ukraine, when transitioning to ecologically-oriented development of the national economy, it is necessary to form an effective strategy for such development, which will improve the quality of life of the country`s population, preserve the landscape and biological diversity, ensure the ecological and social development of the Ukrainian economy and integrate into the European community.

In addition, the geography of industrial ecosystems is changing under the influence of increasingly wide and fast digital connections. Therefore, there is an objective need for all enterprises to reduce value chains and reorient to production models based on digital technologies, automation, and robotics. Such processes aggravate the problem of the uneven location of production facilities and lead to the restructuring of previously formed industrial ecosystems, which threatens the ecological and economic security of the state. Therefore, it is necessary to form the national economy on modern "smart" and ecologically clean technologies, which will allow overcoming the above-mentioned problems for the development of the production sector.

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