

*Harmider L.D., Zhuravel V.V., Sliuta A.O.*

## ECOLOGICAL AND ECONOMIC SYSTEMS: TRENDS, CURRENT CHALLENGES AND THREATS

Ukrainian State University of Chemical Technology, Dnipro, Ukraine

The article considers the issues and researches ecological and economic systems and their components. The issue of regulating ecological and economic security at the regional level is considered, the current state of the environment of Ukraine, challenges and threats to ecological and economic security are analyzed, and the stages of formation of the risk management system are determined. There are local, regional and global ecological and economic systems. Local ecological and economic system – is a separate link of economic activity (enterprise), which is considered in conjunction with nearby objects of the environment. The regional ecological and economic system is characterized by a higher level and diversity of economic objects and a wider spatial sphere of the environment. The global ecological and economic system is a system in which the economy as a whole and the environment are considered on a global scale or within national borders. The main component that determines the direction and nature of the functioning of the ecological and economic system as a whole is its production unit. The peculiarity of environmental components of the ecological and economic system is that almost all its elements are constantly affected by economic activity. The concept of «ecological and economic system» makes it possible to implement a systematic approach in the study of the problem of interaction of production activities with the environment. An important task of the analysis of the ecological and economic system is to determine the relationships between the parameters of technological processes and changes in the environment. The functioning of the ecological and economic system is based on the principles of metabolism, energy and information between its structural units, which occurs in the process of social production. The efficiency of the ecological and economic system is determined by qualitative and quantitative indicators of resource use and the state of the environment.

**Keywords:** economic security, threats, environment, nature use, risk classification, ecological-economic security, ecological challenges, ecological threats.

**DOI:** 10.32434/2415-3974-2021-14-2-22-28

### *Formulation of the problem*

In modern conditions in recent years related to the development of economic, social and political situation in the world and national space characterized by the deterioration of environmental and economic security. We believe that the relevance of this topic is due to the fact that over the past 20 years since the beginning of the 21st century, global economic security and economy have become more integrated and unstable due to large-scale interconnection of countries at the global level leading to increased vulnerability between other countries.

In addition, with each passing day there is an exceptional increase in current capital between countries, which also undermines the stability of the national economy during the crisis. Thus, the topic of environmental and economic security in the development of globalization is becoming quite relevant today on the grounds that the very processes of globalization are integrated from the world economy into a single web [1, p. 120].

According to experts, the biggest threats to environmental and economic security at the regional and national levels today are the following problems:



- strong differentiation of household income;
- deterioration of the food structure;
- increase in the unemployed population.

The consequences of such threats in ecological and economic security, which are of the greatest importance, are the decline in population growth and mortality, the gradual depletion of the nation “s gene pool as a result of deteriorating material and ecological and economic living conditions, and inefficient health care systems [2, p. 83].

Economic security, which appears in the spheres of another type of national security, penetrates into them and interacts with them, accumulates in itself, while remaining its basis. The key points in environmental and economic security are economic intelligence, identified as a system of information networks, searches and processes the dissemination of information necessary to ensure the economic security of the national level and its actors. In addition, economic intelligence is designed to play a key role in ensuring the security of the country and the region from external threats. [3, p. 275]

Under modern conditions of development of ecological and economic safety, the following threats are of special importance:

- rapid development of the process of transnationalization of economic relations, internationalization of the world economy (called globalization);
- increasing the autonomy and ergonomics of major actors in the transnational economy, with great potential for influencing the economic complexes of individual countries;
- high degree of mobility and interconnection of financial markets based on new technological information tools.

Today, under modern conditions of development of ecological and economic security, the issue becomes relevant, which must be accepted

for justification in the following way to improve the system of financial and economic security and ecological and economic development of the country:

- establishing the boundaries of foreign intervention in the capital of domestic production;
- establishing access limits for foreign investment in industries that are considered important for economic and socio-cultural development of the country;
- measures in relation to companies that have limited business policies created in a competitive environment;
- development of existing control systems for the use of foreign loans.

Ecological-economic security as well as ecological-economic system covers such adjacent territories of the enterprise on which activity of firm is realized. If we consider the effectiveness of the ecological and economic system, it is necessary to determine the main elements on which its functioning depends. Objects of ecological and economic safety and the system of enterprise and entrepreneurial activity are objective activities that affect the environment, the result of which is the management of the company’s management staff for profit. In the process of managerial entrepreneurial activity of the firm there is a constant connection with the processes, phenomena which in turn occur in a certain period of time, which try to improve, correct or eliminate them completely, in accordance with the received (set) goals [4, p. 5-10].

Ecological-economic system and its security consist of two interconnected subsystems: ecological and economic. The ecological subsystem studies the very nature and laws of its functioning and relationship with the environment, and the economic subsystem studies social economic processes and studies the laws of their development and interaction with each other. They are united by the link of nature

Table 1

**Analysis of environmental and economic subsystems of entrepreneurial activity**

Signs	Ecological subsystem	Economic subsystem
Object of research	Nature and laws of its functioning	Laws of development of social and economic processes
Subject of research	Influence of nature management of economic entities	Implementation of the production process as a prerequisite for nature management
Interaction of subsystems	Ensuring economic development, efficiency and growth rates due to the raw material base	Positive or negative impact. (disturbance of natural balance, degradation, etc.)
Planning	Action of the laws of nature	A clear organized process of human activity that has certain established (planned) patterns
Characteristic features	Production processes – spontaneity of action, dynamics of the state and quality of equipment and the most used (used) technologies.	Development of production and its organization, which is manifested in the possibility of choosing its equipment and the order of use of the choice of measures and the contract with the supplier company.

management, which is the basis for ensuring the implementation of economic processes, its security, because without the use of natural resources will be impossible to carry out business activities.

The main differences between environmental and economic subsystems are presented in Table 1.

Ecological-economic processes affect the production cycle of the product itself as well as the basis of the whole process of work in the future which is – the cost of the product. Production-technological and socio-environmental and economic indicators – are the processes of revival in the very indicators of development of entrepreneurial activity of production, firm. Social processes that affect the effective functioning of enterprises and firms, in particular the level of material movement, labor and financial flow are responsible for ensuring working conditions, while reflecting the cost factor of the production process. Ecological systems and ecological-economic security are closely interrelated with the system and the development of the nature of use.

It is known that the effectiveness of nature using and environmental activities – improving the environment and the development of scientific and technical solutions. The purpose of which is to hide the issues of ecological and economic analysis and research aimed at identifying the causes of production activities that lead to deteriorating environmental system in a given area and making responsible requirements for management decisions that should take into account the state of environmental activities in the country such as:

- carrying out a comprehensive assessment and appropriate measures for nature management processes;

- assessment of the impact of companies and enterprises on the state of the environment and assessment of the effectiveness of environmental measures, etc.;

- efficiency of use of resource-saving technologies;

- analysis of the effectiveness of the current, general and capital costs of the enterprise, the company for environmental measures;

- efficiency of application at the enterprise, firm of application of the ecological tax;

- influence of ecological and economic processes on sustainable economic development.

One of the important values in making managerial decisions is the use of environmental – economic analysis on the principle of business efficiency. The analysis, in turn, increases the high efficiency of the enterprise, ensures efficiency and allows not only to improve but also to develop a new set of parameters which in turn are associated with sustainable economic development. In this case,

the environmental activities of the enterprise, the company is determined comprehensively and comprehensively using a variety of techniques, a wide information base. Thus, an important assessment of the analysis of the state of ecological and economic activity of the enterprise is the question of the state of the subject of entrepreneurial activity for a certain period of time [5, p. 117-124].

Considering some issues of environmental and economic security of the country, the problems of their formation are multifaceted in nature, as centuries-old subordination of the country and individual regions was due not only to geopolitical, military and economic factors, but also unconsolidated leadership of a group of people. competed and clashed with each other in the struggle for foreign policy orientations and personal status on the so-called «political and economic Olympus».

Today, environmental and economic security is threatened by more and more situations arising from the neglect and disregard for the laws of nature, in terms of this problem is relevant that the country's environment is ecologically transformed to such an extent many times higher than the economic efficiency of development.

Given the theoretical and practical significance, it should be noted that the problem of adequate security, environmental and economic security of the region and the environment requires a more detailed understanding from the standpoint of analyzing the relationship of such phenomena as environmental challenges, economic and environmental threats and risks in the national security system. countries.

In itself, the specifics of environmental and economic security is that in order to ensure the progressive development of vital interests of man and enterprise, society and the environment, the state must use its management decisions to prevent and eliminate potential or real threats of danger arising from anthropogenic and man-made systems.

The structure of such a natural environment is formed from systems of elements of nature, species composition of fauna and flora, natural resources, between which there is a connection, preservation of such relationships and is primarily the duty of nature protection and environmental - economic support of the country and the state in general [6, p. 26-30].

We believe that in the future Ukraine as a state of the most important natural resources, such as: bioproductive soils, water, minerals, heat carriers (oil, gas, peat, uranium and gas), etc. All this negatively affects the state of the environment and in itself the uncontrolled development of the technosphere, which significantly affects the environment through the development of technical and man-made objects

(enterprises, roads, houses, etc.). It is in this section that the problems of maximum amplitude are identified and priorities emerge in favor of the ecological and economic security of the country over all other types of security, as they determine the existence of man as a civilized society and the species as a whole [7].

Ecological-economic security in the forefront is characterized by production-productive stability and its ability to respond in a timely manner to the situation of the agro-industrial market; availability of the necessary volumes of transitional stocks; the level of solvency of the population, which should ensure the availability of food for all citizens; preventing import expansion for those food products, the production of which in the required quantities can be carried out by the national agri-food complex.

The formation and implementation of environmental-economic policy and security of the state (business entity) in the field of agro-industrial and economic production, in the future, should be based on the need for coordination of environmental and economic concepts on its own without taking into account environmental factors, ie without its inclusion in the analysis. It is impossible to solve the problem of sustainable development of the country's economy and ecological and economic security in general, including the food complex. All this requires exceptional and sound decisions on economic and environmental assessment of the political situation in the country, determining the direct and indirect

possible consequences of projects and constraints, assessing the relationship between economic benefits and possible consequences of environmental damage. Organizational and economic mechanism of environmental management should include:

- economic stimulation of resource-saving and nature protection activities;
- organizational measures to ensure the implementation of environmental measures [8, p. 121-135].

Thus, environmental-economic security in the agricultural sector – is a system of mutually agreed actions aimed at economic incentives for resource-saving and environmental activities in the field of agricultural production; reconstruction of agro-industrial enterprises, transition to waste-free and low-waste technologies, utilization of production waste; construction of treatment facilities, gas – dust catchers; reclamation of disturbed lands; organization of monitoring and unified state protection of the environment, aimed at preserving the safe for living and inanimate environment, protection of life and health from negative impacts, achieving harmonious interaction of society and nature, protection, rational use and reproduction of natural resources, etc. Considering the enterprise as a socio-ecological-economic system (SEES) of a lower level (in relation to the region and the state), its environmental and economic security means a state of global stability and dynamic balance of SEES, which ensures reliable existence, reproduction and development. This

Table 2

The main theoretical approaches to the definition of ecological-economic security

Author of the theory	Definition
Economic encyclopedia. for ed. Mocherny S.V.	The state of the environment within the world economy, in the country as a whole and in individual regions and enterprises, which does not endanger the health of the population in the process of work and life [3]
Lipkan V. A.	Component of national security, the process of managing the national security system, in which state and non-state institutions ensure ecological balance and guarantee protection of habitats and the biosphere as a whole, atmosphere, hydrosphere, lithosphere and space, species of fauna and flora, natural resources, conservation human health and life and the long-term consequences of this impact for present and future generations are excluded [4]
Makarenko E. A..	Component of global and national security, ie the state of development of public relations in the field of ecology, in which the system of state, organizational, scientific, technical, economic and other social means provides regulation of environmentally hazardous activities, use of natural resources, protection of natural environment, safe for life and human health, prevention of deterioration of the ecological situation and the emergence of danger to natural systems and the population [1]
Shmandiy V. M.	A dynamic component of the regional system that ensures its harmonious development in conditions of protection from real and potential anthropogenic and natural influences. The level of safety is mainly determined by the probability of danger. This requires a comprehensive study of the conditions for the formation of environmental hazards [6, p. 18]
Shulga M.V. , Hetman A.P.	It is a socially natural and scientific reality, is the object of study of various sciences (natural, social, legal, etc.), as it covers a complex set of human relationships with the natural environment; social category, inherent in human society, is formed within social relations; has certain legal forms of non-legal nature, although it belongs to the phenomena [7, p. 103]

approach to understanding environmental and economic security allows us to consider it as a function of the system aimed at achieving its maximum efficiency, minimal disruption of its balance due to external influences, increasing resilience to them, maintaining the ability to self-regenerate and self-organize. Ecological and economic security should ensure such internal interaction of SEES elements, at which high rates of expanded reproduction of production, economic growth and increase of welfare are accompanied by preservation and improvement of the environment.

Based on this, the study of environmental and economic safety can be carried out in two directions – «SEES impact on the environment» and «perception of SEES reaction of market participants to the nature of its action», which correspond to the following methodological approaches: 1) on the environment, ie on the level of environmental safety; 2) based on the analysis and evaluation of SEES indicators. Applying these two approaches comprehensively, the authors proved the priority of greening production and consumption to ensure the environmental and economic security of all market participants. The impact of reorientation of enterprises on the production of eco-goods, on environmental safety is shown in Figure.

Figure shows the long-term dependence of the level of environmental and economic security and environmental goods in terms of output on parts of total production. The curvature of dependence has a curved profile due to the fact that the components of eco-destructive impact are one of the other, due to the increase in overall impact.

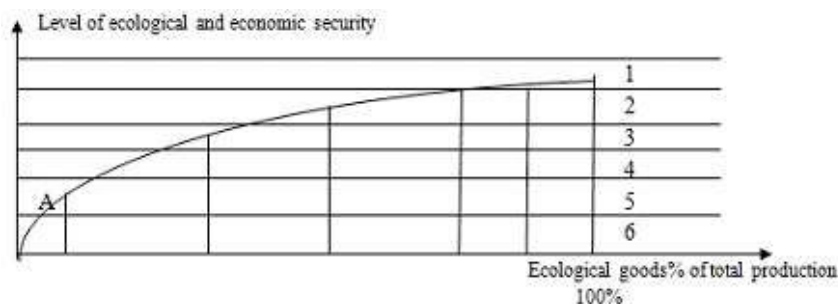
This curve does not affect the boundary of the first level of environmental safety, because even with 100% production of environmental goods some eco-destructive impact on the environment will still be (of course, if in the future can not provide food, housing, etc. by synthesizing solar energy, etc.). The curvature of the graph in Fig. 1 varies depending on production volumes. As it grows, the share of environmental goods that need to be produced grows progressively.

The second position, related to external threats to the environmental security of enterprises, is

determined primarily by the scope and specifics of their activities. In particular, for agricultural enterprises, forestry and other natural enterprises, climatic and natural conditions are important, the absence of natural and man-made disasters. For many institutions of the service sector, a clean environment, air, the presence of intact ecosystems, quality fresh water (tourism, recreation) are important. In this context, the environmental safety of the enterprise is associated with: the presence of favorable natural and climatic conditions; availability and accessibility to the necessary natural resources, including water, land; absence of threats of natural and man-made origin (including radiation, acoustic, ionizing, wave); lack of negative impact – pollution, hazardous waste from other entities; availability of an effective legal framework and environmental management system; compliance with environmental standards, technical, sanitary, construction and other norms and rules that contain requirements for environmental protection.

### Conclusions

Thus, based on the above, it can be argued that the environmental and environmental -economic security of the enterprise is, on the one hand, a state of protection from the negative effects of internal and external environment, on the other - the ability of the enterprise and business to quickly eliminate threats and respond to possible impacts. and to ensure its functioning on the basis of ecologically oriented and ecologically technological managerial innovations that make it impossible to harm the environment, human life and health. Since the greening of production reflects the long-term goals of enterprise development, environmental safety in the enterprise management system should be considered as a criterion for strategic decisions on: ensuring compliance of all aspects of enterprise compliance with current environmental legislation and national and international environmental standards; ensuring ecological rehabilitation and reproduction of disturbed ecosystems; use of environmentally safe resources and technologies; training of specialists who make environmentally - motivated management decisions; use of environmental management in the management system of enterprises; formation of an effective system of information and analytical support



Dependence of the level of eco-goods on the level of entrepreneurial activity

for environmental safety management. The general provisions on defining the essence of ecological safety and its place in the system of ecological and economic security of the region and its existence in the environment of production and enterprise are developed and averaged and in the article need further development. At the forefront, the problems of forming an environmental safety management system, organizational and personnel support of these processes remain relevant in this matter.

## REFERENCES

1. Milgui, T.P., & Morozova, N.A. (2018). *Vplyv hlobalizatsii na zabezpechennia ekonomichnoi bezpeky krainy [The impact of globalization on economic security of the country]*. [in Ukrainian].
2. Nekrasova, V.V., Nesterenko, I.N., & Tiratsuyan, V.H. (2019). Upravlinnia systemoyu ekonomichnoi bezpeky orhanizatsii v umovakh hlobalizatsii [Management of the economic security of the organization in the context of globalization]. *Ekonomichnyi visnyk Donbasskoho derzhavnogo telhnychnoho universytetu – Economic Bulletin of Donbass State Technical University, 1*, 83-87 [in Ukrainian].
3. Osipova, A.A., & Barshova, O.A. (2018). Problemy zabezpechennia ekonomichnoi bezpeky Rosiiskoi federatsii v umovakh hlobalizatsii [Problems of economic security of the Russian Federation in the context of globalization]. *Aleia nauky – Alley of Science, 4 (20)*, 761-768 [in Ukrainian].
4. Hlubitska, T.V. (2013). Konceptualni osnovy funktsionuvannia ekoloho-ekonomichnykh system [Conceptual bases of functioning of ecological-economic systems]. *Visnyk SumDU. Serii "Ekonomika" – Bulletin of SSU. Series «Economics»*, 1, 5-10 [in Ukrainian].
5. Tanasieva, M.M. (2013). Teretyko-ekonomichni zasady ekoloho-ekonomichnoho analizu [Theoretic-methodical principles of ecological-economic analysis]. *Visnyk UKDTU – Bulletin of the UCTU, 4*, 117-124 [in Ukrainian].
6. Lutsenko, N.O. (2010). Kryza ekoloho-ekonomichnoi systemy v ramkakh kontseptsii staloho rozvytku [Crisis of ecological - economic system within the concept of sustainable development]. *Visnyk Skhidnoevropeiskoho universytetu ekonomiky i menezhmentu – Bulletin of Eastern Europe. University of Economics and Management, 1 (7)*, 26-30 [in Ukrainian].
7. Tarasova, V.V. (2010). Kompleksna otsinka ekolohichnoi bezpeky Ukrainy [Complex assessment of ecological safety of Ukraine]. *Naukovi dopovidi Natsionalnoho Universytetu bioresursiv i pryrodokorystuvannia Ukrainy – Scientific Reports of Naional. University of Bioresources and Nature Management of Ukraine, 4 (20)* [in Ukrainian].
8. Makarenko, E.A., Ryzhkov, M.M., & Ozhevan, M.A. et al. (2003). *Analytika, ekspertyza, prohnozuvannia [Analytics, examination, forecasting]*. Kyiv: Nash kultura i nauka [in Ukrainian].

Received 10.10.2021

Reviewer: Doct. of Econ. Sc., Prof. Fedulova S.O.

## ЕКОЛОГО-ЕКОНОМІЧНІ СИСТЕМИ: ТЕНДЕНЦІЇ, СУЧАСНІ ВИКЛИКИ ТА ЗАГРОЗИ

Гармідер Л.Д., Журавель В.В., Слюта А.О.

У статті досліджено еколого-економічні системи та їх складові. Розглянуто питання регулювання еколого-економічної безпеки на регіональному рівні, проаналізовано сучасний стан довкілля України, виклики та загрози еколого-економічній безпеці, визначено етапи формування системи ризик-менеджменту. Розрізняють локальну, регіональну та глобальну еколого-економічну систему. Місцева еколого-економічна система – окрема ланка господарської діяльності (підприємства), яка розглядається в сукупності з прилеглими об'єктами навколишнього середовища. Регіональна еколого-економічна система характеризується вищим рівнем і різноманітністю господарських об'єктів та ширшою просторовою сферою навколишнього середовища. Глобальна еколого-економічна система – це система, в якій економіка в цілому та навколишнє середовище розглядаються в глобальному масштабі або в національних кордонах. Основною складовою, що визначає спрямованість і характер функціонування еколого-економічної системи в цілому, є її виробнича одиниця. Особливістю екологічних компонентів еколого-економічної системи є те, що майже всі її елементи постійно зазнають впливу господарської діяльності. Поняття «еколого-економічна система» дає змогу реалізувати системний підхід в межах дослідження проблеми взаємодії виробничої діяльності з навколишнім середовищем. Важливим завданням аналізу еколого-економічної системи є визначення взаємозв'язків між параметрами технологічних процесів і змінами навколишнього середовища. Функціонування еколого-економічної системи ґрунтується на принципах обміну речовин, енергії та інформації між її структурними одиницями, що відбувається в процесі суспільного виробництва. Ефективність еколого-економічної системи визначається якісними та кількісними показниками використання ресурсів та стану навколишнього середовища.

**Ключові слова:** економічна безпека, загрози, навколишнє середовище, природокористування, класифікація ризиків, еколого-економічна безпека, екологічні виклики, екологічні загрози.

## ЭКОЛОГО-ЭКОНОМИЧЕСКИЕ СИСТЕМЫ: ТЕНДЕНЦИИ, СОВРЕМЕННЫЕ ПРОБЛЕМЫ И УГРОЗЫ

Гармидер Л.Д., Журавель В.В., Слюта А.О.

В статье исследованы эколого-экономические системы и их компоненты. Рассмотрена проблема регулирования эколого-экономической безопасности на региональном уровне, проанализировано современное состояние окружающей среды Украины, вызовы и угрозы эколого-экономической безопасности, определены этапы формирования системы управления рисками. Существуют локальные, региональные и глобальные эколого-экономические системы. Местная эколого-экономическая система – отдельное звено экономической деятельности (предприятие), которое рассматривается во взаимосвязи с близлежащими объектами окружающей среды. Региональная эколого-экономическая система характеризуется более высоким уровнем и разнообразием экономических объектов и более широкой пространственной сферой окружающей среды. Глобальная эколого-экономическая система – это система, в которой экономика в целом и окружающая среда рассматриваются в глобальном масштабе или в пределах национальных границ. Основной составляющей, определяющей направление и характер функционирования эколого-экономической системы в целом, является ее производственная единица. Особенность экологической составляющей эколого-экономической системы состоит в том, что практически все ее элементы постоянно находятся под воздействием хозяйственной деятельности.

Понятие «эколого-экономическая система» позволяет реализовать системный подход в рамках исследования проблемы взаимодействия производственной деятельности с окружающей средой. Важной задачей анализа эколого-экономической системы является определение взаимосвязей между параметрами технологических процессов и изменениями окружающей среды. Функционирование эколого-экономической системы основано на принципах обмена веществ, энергии и информации между ее структурными единицами, что происходит в процессе общественного производства. Эффективность эколого-экономической системы определяется качественными и количественными показателями использования ресурсов и состоянием окружающей среды.

**Ключевые слова:** экономическая безопасность, угрозы, окружающая среда, природопользование, классификация рисков, эколого-экономическая безопасность, экологические вызовы, экологические угрозы.

#### ECOLOGICAL AND ECONOMIC SYSTEMS: TRENDS, CURRENT CHALLENGES AND THREATS

Harmider L.D., Zhuravel V.V., Sliuta A.O.\*

Ukrainian State University of Chemical Technology, Dnipro, Ukraine

\* email: zhuravelao094@gmail.com

Harmider L.D. ORCID: <https://orcid.org/0000-0001-7837-2734>

Zhuravel V.V. ORCID: <https://orcid.org/0000-0001-7914-0476>

The article considers the issues and researches ecological and economic systems and their components. The issue of regulating ecological and economic security at the regional level is considered, the current state of the environment of Ukraine, challenges and threats to ecological and economic security are analyzed, and the stages of formation of the risk management system are determined. There are local, regional and global ecological and economic systems. Local ecological and economic system – is a separate link of economic activity (enterprise), which is considered in conjunction with nearby objects of the environment. The regional ecological and economic system is characterized by a higher level and diversity of economic objects and a wider spatial sphere of the environment. The global ecological and economic system is a system in which the economy as a whole and the environment are considered on a global scale or within national borders. The main component that determines the direction and nature of the functioning of the ecological and economic system as a whole is its production unit. The peculiarity of environmental components of the ecological and economic system is that almost all its elements are constantly affected by economic activity. The concept of «ecological and economic system» makes it possible to implement a systematic approach in the study of the problem of interaction of production activities with the environment. An important task of the analysis of the ecological and economic system is to determine the relationships between the parameters of technological processes and changes in the environment. The functioning of the ecological and economic system is based on the principles of metabolism, energy and information between its structural units, which occurs in the process of social production. The efficiency of the ecological and economic system is determined by qualitative and quantitative indicators of resource use and the state of the environment.

**Keywords:** economic security, threats, environment, nature use, risk classification, ecological-economic security, ecological challenges, ecological threats.

#### REFERENCES

1. Milgui, T.P., & Morozova, N.A. (2018). *Vplyv hlobalizatsii na zabezpechennia ekonomichnoi bezpeky krainy* [The impact of globalization on economic security of the country]. [in Ukrainian].
2. Nekrasova, V.V., Nesterenko, I.N., & Tiratsuyan, V.H. (2019). Upravlinnia systemoyu ekonomichnoi bezpeky orhanizatsii v umovakh hlobalizatsii [Management of the economic security of the organization in the context of globalization]. *Ekonomichnyi visnyk Donbasskoho derzhavnoho telhichnoho universytetu – Economic Bulletin of Donbass State Technical University*, 1, 83-87 [in Ukrainian].
3. Osipova, A.A., & Barshova, O.A. (2018). Problemy zabezpechennia ekonomichnoi bezpeky Rosiiskoi federatsii v umovakh hlobalizatsii [Problems of economic security of the Russian Federation in the context of globalization]. *Aleia nauky – Alley of Science*, 4 (20), 761-768 [in Ukrainian].
4. Hlubitska, T.V. (2013). Konceptualni osnovy funktsionuvannia ekoloho-ekonomichnykh system [Conceptual bases of functioning of ecological-economic systems]. *Visnyk SumDU. Seriya «Ekonomika» – Bulletin of SSU. Series «Economics»*, 1, 5-10 [in Ukrainian].
5. Tanasieva, M.M. (2013). Teretyko-ekonomichni zasady ekoloho-ekonomichnoho analizu [Theoretic-methodical principles of ecological-economic analysis]. *Visnyk UKDTU – Bulletin of the UCTU*, 4, 117-124 [in Ukrainian].
6. Lutsenko, N.O. (2010). Kryza ekoloho-ekonomichnoi systemy v ramkakh kontseptsii staloho rozvytku [Crisis of ecological - economic system within the concept of sustainable development]. *Visnyk Skhidnoyevropeiskoho universytetu ekonomiky i menedzhmentu – Bulletin of Eastern Europe. University of Economics and Management*, 1 (7), 26-30 [in Ukrainian].
7. Tarasova, V.V. (2010). Kompleksna otsinka ekolohichnoi bezpeky Ukrainy [Complex assessment of ecological safety of Ukraine]. *Naukovi dopovidi Natsionalnoho Universytetu bioresursiv i pryrodokorystuvannia Ukrainy – Scientific Reports of Naional. University of Bioresources and Nature Management of Ukraine*, 4 (20) [in Ukrainian].
8. Makarenko, E.A., Ryzhkov, M.M., & Ozhevan, M.A. et al. (2003). *Analityka, ekspertyz, prohnozuvannia* [Analytics, examination, forecasting]. Kyiv: Nash kultura i nauka [in Ukrainian].