SOME ASPECTS OF THE CREATION OF AN ENVIRONMENTAL AND ECONOMIC RISK MANAGEMENT SYSTEM IN THE CONTEXT OF THE ELABORATION OF REGIONAL SUSTAINABLE DEVELOPMENT INSTRUMENTS

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Abstract. A feature of recent decades is the increased interest in studying the problems of the generation and neutralization of environmental and economic risks, as well as their possible consequences in the daily activities of regional economic systems. Undoubtedly, the problems of achieving sustainable development of the territories are rather rigidly associated with the need to implement national programs to neutralize environmental and economic threats to public health and prevent possible economic damage to the environment. All this speaks of the relevance of improving the theoretical and methodological principles and empirical and factual methods of studying environmental and economic risks in the context of achieving sustainable development of the regional socio-ecological and economic system.

Key words: globalization, regional economic complex, nature management, triune spiral, environmental risks, management, socio-ecological-economic system, sustainable development.

1 Introduction

Any modern construction of the organizational and economic mechanism of effective environmental management at the regional level is fraught with the need to take into account possible environmental and economic development risks that arise in the daily production and economic activities of the regional economic system entities. In the context of today's realities, it is necessary for authorities and civil society to stimulate environmentally-friendly behaviour of all participants in the vital activity of territories and, first of all, of economic entities. And this is natural, because the concept of "environmental and economic risk" has long been no longer the prerogative of scientific research alone; it is already widely used in the everyday life of the population.

An analysis of the specialized literature on the issues under consideration allows us to note that there are many scientific publications that thoroughly consider various aspects of the conceptual provisions for the sustainability of regional development, and also for economic problems of environmental protection and nature management. The scientific substantiation of the socio-ecological-economic development concept for the Russian Federation and its subjects is given. [Akimova T.A. 2003, Gaponenko A.L. 1999, Misakov V.S. 2007, Musaev M.M., Musaeva H.M., Misakov V.S. 2018]

At the same time, a number of theoretical and methodological aspects of managing environmental and economic risks in the system of instruments for regional sustainable development are still in demand for their scientific consideration; they have scientific relevance, which led to the choice of the topic of our study.

2 Research Methodology

The theoretical and methodological basis of our study was the scientific works of foreign and domestic scientists in the field of management theory, regional economics, environmental economics, the theory of sustainable development of regions, and environmental and economic risk management.

The instrumental and methodological basis of this work was composed by the methods of a system-functional approach in developing a mechanism for reducing and neutralizing the environmental and economic risks of regional development.

The study involved methods of systemic, comparative, structural-functional, functional-cost, index analysis, grouping and generalization.

3 Research Results

The importance of regions as the main subjects of the national economy was especially clearly manifested in the context of globalization and increasing competition. Each region has a number of fundamental characteristics, such as integrity, comprehensiveness, manageability, specialization, etc.

In accordance with the current legislation of the Russian Federation, a region is part of the territory of the Russian Federation, which has common natural-climatic, socio-economic, national-cultural and other conditions. [The concept of sustainable development and risks for Russia 2012]

Any region, being a complex territorial entity, has “its own” special socio-ecological-economic relations. The continuous interaction between the regional economic system and the environment is accompanied by the constant presence of a risk factor. This requires the immediate development of methodological provisions for improving the strategic management system by optimizing the parameters of the phenomenon under consideration in order to ensure the sustainability of the development of the regional socio-ecological-economic system.

In the specialized literature, the main forms of regional stability of a territory are considered; signs of regional stability were identified, several dozen different mechanisms for the sustainable development of territories were proposed. [Bychkova E.A. 2005, Krasnova T.A. 2000]

For all these varieties of the mechanism under consideration, their focus on achieving balance in solving socio-ecological-economic problems, and improving the quality of life, and also conservation of natural resource potential are common. At the same time, sustainable development is understood to mean such development, which, despite certain environmental impacts, does not destroy the natural basis for the reproduction of human life. [The concept of sustainable development and risks for Russia 2012]

Sustainable development is an evolutionary type of development of civilization, suggesting the optimal management of the natural, social and cultural wealth of mankind. [Yakovleva I.Yu. 2012]

The dominance of the economic aspect of sustainable development in the XXI century means a move away from building up the use of the natural resource potential of the biosphere towards its rationalization.

The availability of a social aspect indicates the readiness of society to switch to democratic principles of governance, taking

into account the possibilities of combining the interests of a market economy and the need to implement the social functions of the state.

The environmental aspect indicates the priority of ensuring the conservation of the natural base.

An analysis of the specialized literature on the issues under consideration allowed us to generalize and single out the most popular interpretations to establish the essence of the sustainable development concept. In general, they substantiate, that:

- It is necessary to create a single and harmonious social, economic and environmental system in the interests of the entire community in order to ensure sustainable development,
- Economic growth and an increase in the quality of life of the population should correspond to the parameters of the economic capacity of the biosphere;
- Sustainable development is impossible without the restoration and preservation of natural ecosystems to a level that will allow the stability of the natural environment. [Abdulaev I.A. 2017, Velieva D.S. 2010, Rastvortseva S.N., Grineva N.A. 2010, Yashin E.A. 2009]

It can be noted that in any case, different authors regard sustainable development as the most important condition for ensuring regional environmental safety.

Speaking about the system of sustainable development, environmental safety, etc., they cannot be implemented without the concept of "environmental risk". This concept allows us to explore various forms of communication between negative environmental impacts and environmental objects, find out the potential danger of various activities, rank adverse environmental impacts, manage environmental risks, etc.

Hence, environmental risk can be considered in the form of an integrated assessment (quantitative measure) of possible environmental hazards. [Zakharova E.I., Bartashevich A.L. 2011;Misakov V.S., Baiduev I.Z., Gendugov S.Z. 2015;Yashin E.A. 2009]

The practice of recent decades shows that local events in the context of increasing globalization processes and the active development of ICT are increasingly leading to global risk communication. This indicates the formation of a new economy characterized by a transition from risk accumulation to risk multiplication.

The key goal of managing environmental and economic risks in the regional economic system is to ensure the maximum reduction of their level up to neutralization, taking into account environmental aspects of the development of territories. Proper risk management requires an appropriate system of regulatory, administrative and economic mechanisms aimed at neutralizing negative environmental impacts in the region, taking into account social and environmental factors.

In general, it is advisable to understand environmental and economic risk as a measure of the formation of undesirable environmental consequences when implementing some kind of investment project regarding natural ecosystems and public health. As can be seen from the foregoing, the calculation of risk is always conditional, since it is a question of the possibility of determining the probability of the occurrence of some undesirable event, of choosing an adequate model of damage formation and its price expression. It should also be noted that it is not only conditional, but also quite complicated and, in our opinion, not correct, because it is impossible to express directly in monetary terms, for example, human life or a unique landscape as an object of environmental damage.

There are many methodological approaches to environmental risk assessment in the specialized literature, in particular, the US Environmental Protection Agency (EPA), the UN Special Program, etc. As a rule, they are focused on considering the damage to human health from the adverse effects of a polluted environment...

Despite their relative simplicity, such approaches to diagnosing environmental pollution risk parameters are quite promising in predicting the negative consequences of this pollution, in developing priority areas for managing the state of the environment, etc.

Improving the methodological approaches to diagnosing environmental risk involves the development of effective tools for the objective substantiation of quantitative parameters concerning the probability of generating harmful consequences for the population due to environmental pollution. Hence, it can be argued that the methodological basis of risk assessment as a mechanism for environmental management should be based on two of its interrelated components:

1. Risk assessment system;
2. Risk management system.

Diagnosing environmental risk is the first step and basis of the environmental risk management mechanism. It is clear that its objectivity depends on many factors that form the technique for constructing initial indicators, on the specifics of the chosen method, on the reliability of the information received, etc. All this is extremely important, since it is precisely these provisions that determine the objectivity of risk assessment regarding public health and the environment, the accuracy of risk identification, the determination of risk characteristics, etc.

Experts note the extreme complexity of creating an information base for diagnosing an environmental base: a large number of specialists with different areas of expertise participate in this process, including, in addition to analysts in economics, also toxicologists, hygienists, and oncologists, etc., who, analysing physical and chemical properties of polluting harmful substances, determine the most appropriate data for the analysis of the risk associated with them. We are talking about the nature of the influence, the depth of metabolism, mutagenicity and carcinogenicity of the analysed factors and the formation of the necessary information base. This approach allows us to calculate the weighted exposure types of substances and compounds discharged by the source of pollution and thereby to establish the most significant sources of danger for diagnosing the risk of an economic entity. [Velieva D.S. 2010;Misakov V.S. 1985;Shmal A.G. 2004;Orhuls W. 1977]

It seems to us that, to a greater extent, the diagnosis of risk is a logical process involving an analytical and logical generalization of the information obtained on the basis of a detailed study concerning the complex of all kinds of assumptions and uncertainties that occurred in the risk assessment. It should be noted that just improving the methodology for diagnosing risk should be aimed, first of all, at developing clear principles and rules for resolving such uncertainties.

Analysts pass the results of diagnosis to colleagues who are involved in risk management.

At the same time, managers should emphasize the development of measures to prohibit and prevent the negative impacts of the studied factors on the natural environment.

When solving such problems, it is necessary to use a modern instrumental and methodological base, which can act as the basis for the development of a set of targeted measures to prevent the formation of risks.

When developing such events, regional authorities and administrations must accurately evaluate their capabilities, what are the resource requirements for the realisation implementation of the proposed measures, to justify the economic feasibility of these actions, etc. [Akimova T.A. 2003;Misakov V.S., Baiduev I.Z., Gendugov S.Z. 2015;Yakovleva I.Yu. 2012]

It should be noted that in the republics of the North Caucasus, institutional and instrumental and methodological support is actively being formed to support a set of targeted actions to reduce and neutralize environmental and economic risks, and what is very important, the rules of mandatory environmental-friendly behaviour of all legal entities and individuals is being consolidated at all levels of regional management upon approval and implementation of regulatory acts in the field of environmental protection.

Involvement of the modern environmental and economic mechanism for the sustainable development of the regional socio-ecological-economic system should reduce environmental and economic risks, prevent the scale of economic damage, and ensure environmental safety. Of course, this requires the formation of an ordered vector of environmentally priority areas of territorial development, taking into account the scale of possible environmental threats. The effective use of the ecological and economic mechanism in many respects depends on the "environmental initiatives" not only of the authorities, but also business entities and the civilian population of the territory.

There are many methods of economic analysis to assess the economic efficiency of environmental measures. Cost-effective analysis can be called among these methods; it is also called "cost-benefit analysis." [Optimization of radiation protection based on cost-benefit analysis: 1995] Its advantage is a clear focus on assessing socio-economic damage, which allows us to further optimize environmental safety and develop effective measures aimed at reducing health risks.

In accordance with this methodology, the event (production) being organized and associated with a risk to the health of citizens, can be considered justified if the resulting net economic effect $V > 0$:

$$V = Э – P – X – Y > 0 \quad (1)$$

Where Э is the full economic effect; P is reduced costs (without security costs); X - environmental costs; Y - residual economic damage from environmental impacts or public health. [Optimization of radiation protection based on cost-benefit analysis: 1995]

There are a number of other methodological approaches that show the possibility of a step-by-step multilevel risk study when considering socio-ecological and economic problems. [Rastvortseva S.N., Grineva N.A. 2010]

In general, the algorithm for monitoring environmental and economic risks in the system of instruments for regional sustainable development may consist of the following steps.

At the first stage, it is necessary to form threshold indicators for assessing stability.

At the second stage, it is necessary to carry out a classification of development and highlight weaknesses in the regional socio-ecological-economic system.

At the third stage, a factor analysis of the sustainability of regional development is carried out.

The fourth stage assesses the impact of risk and uncertainty.

At the final stage, the necessary recommendations are developed.

It seems to us that the proposed algorithm for monitoring the sustainability of territorial development allows us to actively use all the elements of economic research (observation, analysis, grouping, comparison, detailing, elimination, diagnosis and forecasting of the environmental and economic risk factor), which will allow regional managers to develop effective management decisions and recommendations aimed at improving the socio-ecological and economic situation in the region.

4 Conclusions and Proposals

1. A feature of the last years of regional development in Russia is the given orientation of the territories towards a balanced solution of the set socio-ecological and economic problems; to improve the quality of life of the population; to solve the problems of preserving the natural resource potential for next generations.
2. The environmental safety system is represented by three blocks at the level of the constituent entities of the Russian Federation:

- Comprehensive environmental assessment of the region;
- Environmental monitoring;
- Management decisions.

3. In the conditions of a chronic deficit of financial and material resources, the effectiveness of the regional socio-ecological-economic policy that is carried out now clearly depends on the given priorities for the distribution of these resources in the relevant areas. We are talking about the need for a reasonable combination of the interests of social and economic policy in order to ensure sustainable regional development.
4. The concept of "environmental risk" was introduced into scientific circulation to reflect the most significant relationships between negative environmental impacts and environmental objects. An algorithm is proposed for monitoring the sustainability of territorial development to search for ways to reduce and neutralize environmental and economic risks at the regional level; the algorithm contains a group of functional chains (measures) to reduce environmental and economic risks, to prevent economic damage, and to ensure environmental safety.

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