Formation of a policy to ensure environmental safety in modern economic conditions

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Abstract. Issues of environmental conservation and biological diversity for future generations come to the fore in connection with increasing volumes of production waste and emissions of pollutants into the air. The study formulated the basic mechanisms for ensuring environmental safety, among which we can single out the environmental assessment of the regions, environmental monitoring and organizational and management decisions aimed at preserving the natural environment for future generations. As part of the work, the state environmental protection program for the period from 2012 to 2020 was reviewed, with a budget allocation of 286.65 billion rubles, and environmental safety indicators, as a result of which, it was concluded that there were no progressive changes in matters of environmental protection. Based on what, the authors of the study proposed a conceptual model for ensuring environmental safety of the environment, based on the convergence of all organizational structures and the development of joint subprograms to preserve the natural environment for future generations. In conclusion, the study presents the main findings and results of the work.

1. Introduction
Issues of ensuring environmental safety and environmental protection are updated during the period of increasing volumes of consumption and production of goods and services [1]. In recent years, the theme of environmental conservation has come to the fore in connection with the adoption of new regulatory documents and the entry of the Russian Federation into international alliances for the conservation of climate and natural resources. Russia, which is located on a large-scale territory, requires a search for both universal methods of preserving the environment, and individual methods to achieve their goals [2].

In the Russian Federation, industrial production is the main source of environmental pollution, as there are many mineral processing and electric power stations located on the territory of the country, processing industry is developed, which negatively affects the environmental situation and forms more than half of all pollutant emissions into the air [3; 4]. Reducing the negative environmental impact at
the national level is regulated by state laws, standards and industry requirements, and at the company level corporate strategies for sustainable development are developed and implemented, containing a set of organizational, technical and economic measures aimed at achieving an environmental balance [5; 6].

However, the programs adopted at the federal and industry levels are not being implemented, and industrial enterprises do not have enough financial resources to achieve their goals and objectives, and at the same time, society and state institutions require businesses to increase the level of environmental safety.

2. Materials and methods
The purpose of this study is to develop policies to ensure the environmental safety of the environment in the Russian Federation. To achieve this goal, the following tasks:

- analyze the current state of the environmental situation in the Russian Federation;
- propose a strategy to improve the environmental safety of industrial production, taking into account industry specifics.

The study used methods of factor, historical, statistical, logical, comparative, economic-mathematical and system analysis, a method of expert assessments that allowed the authors to solve the tasks.

3. Results
Environmental safety is a set of measures that provide a limited amount of pollutant emissions into the atmosphere, water and land in order to preserve biological diversity, humanity and the environment for future generations. In the framework of environmental safety, various mechanisms are used, among which it is advisable to highlight:

- environmental assessment of regions and individual territories, aimed at identifying hazardous industrial production in the regions, assessing the level of environmental pollution, determining indicators of sustainable development of the area and assessing the risks of environmental disaster;
- environmental monitoring, providing constant environmental analysis and monitoring of indicators of sustainable development of the regions and the country as a whole;
- organizational and managerial decisions, including the development of organizational economic, managerial, technical and technological solutions aimed at solving environmental issues and ensuring the conservation of biological diversity for future generations [7; 8; 9].

At the same time, environmental safety programs were adopted at the state level, for example, in 2012, the State Program “Environmental Protection” was adopted with a budget allocation until 2020 of 286.65 billion rubles. Within the framework of the state program, many subprograms have been adopted, among which are environmental quality regulation, conservation of biological diversity, hydrometeorology and monitoring, organization and support of work and research in the Arctic and Antarctic, elimination of accumulated environmental damage, protection of Lake Baikal and socio-economic development Baikal natural territory. The main indicators that are expected to be achieved as a result of the implementation of the state program are as follows:

- reduction of pollutant emissions;
- reduction in the number of cities with clean air;
- reduction in the number of people living in adverse environmental conditions;
- Decrease in the level of solid domestic waste generation;
- reduction of discharges into Lake Baikal and in the Arctic and Antarctic zones [10].
To date, these programs are being implemented, but at the same time, in the opinion of the authors of the article, the goals and objectives have not been fully achieved.

To conduct the most objective analysis, we consider the volume of emissions of pollutants into the air (figure 1) [10].

![Figure 1](image_url)  
**Figure 1.** Emissions of pollutants into the atmosphere, million tons.

It can be seen from the figure that the discharge of polluted wastewater for the period under consideration is reduced, while the volume of emissions of pollutants into the air from stationary sources does not change from 2014 to 2018 and amounts to about 16.5 million tons per year, and the volume of emissions from stationary sources from 2010 to 2018 increase, and reach 15 million tons per year. The presented situation indicates the absence of an effective policy to reduce emissions of pollutants into the air from stationary and mobile sources.

Next, we consider the volume of investment in fixed assets by field of activity (figure 2) [10].

![Figure 2](image_url)  
**Figure 2.** Investments in fixed assets aimed at protecting the environment and rational use of natural resources, in million rubles.
The figure shows that the volume of investments in water resources increased from 2000 to 2014, then there was an increase from 2016 to 2018. Volumes of investments in atmospheric air increase from 2000 to 2015, and then from 2015 to 2018 this indicator decreases, a similar situation is observed with investments aimed at protecting land and natural resources.

Represent environmental innovations in 2017 (table 1) [10].

Table 1. Environmental innovation in 2017.

| Indicator                                                                 | Mining     | Manufacturing | Electricity, gas and steam supply | Water supply |
|---------------------------------------------------------------------------|------------|---------------|-----------------------------------|--------------|
| Percentage of organizations that have implemented environmental innovations, in the total number of organizations that have completed innovations over the past three years, percent | 15.8       | 13.9          | 10.3                              | 19.1         |
| Special costs associated with environmental innovation, million rubles    | 961.4      | 10063.1       | 137.4                             | 802.6        |
| The proportion of organizations using the environmental pollution control system, in the total number of organizations surveyed, percent | 27.9       | 18.2          | 14.8                              | 9.8          |

The table shows the main activities of the economy, which form the largest amount of pollutant emissions into the air. So, for example, the table shows that in the manufacturing sector about 14% of organizations carry out environmental innovations, and the cost amounts to 10 billion rubles. In the field of mining and water supply, costs amount to 1 million rubles each, while in the electric power industry they do not exceed 140 million rubles. At the same time, the share of organizations involved in environmental monitoring is about 20% of the total number of organizations surveyed, which indicates the absence of a single policy for the control of environmental pollution from industrial enterprises [11, 12, 13].

Thus, the analysis of the environmental situation in the Russian Federation indicates the absence of effective measures to improve environmental safety and preserve the environment for future generations.

4. Discussion

In the opinion of the authors of the study, it is necessary to develop a national environmental safety policy with the participation of not only representatives of state, industry and regional authorities, but also industrial enterprises. At the same time, it is necessary to take into account the current state of industrial enterprises and their potential. In our opinion, it is advisable to present the conceptual model of achieving environmental safety in the following form (figure 3).

The logic of the presented model is to combine the efforts of the state, regional, industry and industrial complex to achieve environmental safety. At the first stage, a unified methodology for ensuring environmental safety is developed, then subprograms are formed with the participation of state and private structures. At the next stage, common targets are developed, indicators for evaluating program performance are determined, and principles and methods for environmental monitoring are developed. Next, there is processing and analysis of the data and the development of managerial and organizational solutions for the implementation of environmental safety subprograms. At the final stage, there is a search for methods and ways to implement the developed subprograms, their implementation is monitored and, if necessary, the decisions made are adjusted [14; 15].

Thus, the conceptual model of environmental safety will allow integrating environmental issues into a single management system, which will ensure compliance with environmental requirements and the conservation of biological diversity for future generations.
5. Conclusion
As part of the study, the main directions of ensuring environmental safety in the Russian Federation were considered. The considered state environmental protection program, adopted in 2012, with a budget allocation of 286.65 billion rubles, showed that during this period the environmental situation in the Russian Federation did not improve, but, on the contrary, there was some deterioration. At the end of the work, a conceptual model of environmental safety was proposed, which, according to the authors of the study, should be based on the convergence of state, regional, industry and organizational levels to ensure environmental protection and preservation of biological diversity for future generations.

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