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Criteria and indicators of effective environmental management

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Abstract: The policy in the field of environmental development is determined by the implementation of measures for the implementation of the constitutional rights and obligations of citizens of the Russian Federation by the legislative and executive authorities in this area, on the basis of the "Fundamentals of state policy in the field of environmental development of the Russian Federation for the period up to 2030" approved by the President of the Russian Federation». According to Article 72 of the Constitution of the Russian Federation, the joint jurisdiction of the Russian Federation and the constituent entities of the Russian Federation includes:

- issues of ownership, use and disposal of land, subsoil, water and other natural resources;
- nature management;
- environmental protection and environmental safety;
- specially protected natural areas;
- administrative, administrative procedural, land, water, forestry legislation, legislation on subsoil, on environmental protection.

The strategic goal of state policy in the field of environmental development is to solve socio-economic problems that ensure environmentally oriented economic growth, preserve a favorable environment, biological diversity and natural resources to meet the needs of present and future generations, realize the right of every person to a healthy environment, strengthen the rule of law in the field of environmental protection and environmental safety.

Keywords: biodiversity, investment, innovation, environmental management, medical ecology, forest ecosystem, “green” economy, monitoring, recreation.

INTRODUCTION

The development of these programs "Fundamentals of state policy in the field of environmental development of the Russian Federation for the period up to 2030" is due to the need to ensure environmental safety in the modernization of the economy and in the process of innovative development. These Fundamentals determine the strategic goal, the main tasks of the state in the field of environmental protection and environmental safety and the mechanisms for their implementation. Global environmental problems associated with climate change, loss of biological diversity, desertification and other processes negative for the environment, increased environmental damage from natural disasters and man-made disasters, pollution of atmospheric air, surface and ground waters, as well as the marine environment, affect the interests of the Russian Federation and its citizens.

The ecological situation in the Russian Federation is characterized by a high level of anthropogenic impact on the natural environment and significant ecological consequences of past economic activities. In 40 constituent entities of the Russian Federation, more than 54% of the urban population is under the influence of high and very high air pollution. The volume of wastewater discharged into surface water bodies without treatment or insufficiently treated remains high. The tendency towards deterioration of the state of soils and lands persists in almost all regions. Processes leading to the loss of fertility of agricultural land and to their withdrawal from economic circulation are developing intensively [1,7].

Desertification in one way or another covered 27 constituent entities of the Russian Federation on an area of more than 100 million hectares. The amount of waste that is not involved in secondary economic circulation, but is sent for disposal, is increasing. At the same time, the conditions of storage and disposal of waste do not meet the requirements of environmental safety.

METHODOLOGY

When solving the problem of improving the regulatory and legal support of environmental protection and environmental safety, the following mechanisms are used:

- adoption of legislative and other normative legal acts in order to implement state policy in the field of environmental development;
- creation of a structurally integral, comprehensive and consistent system of legislation of the Russian Federation in the field of environmental protection, environmental safety and rational nature management;
- creation of a regulatory framework for the implementation and application of strategic environmental assessment when adopting plans and programs, the implementation of which may have an impact on the environment;
- strengthening responsibility for violation of the legislation of the Russian Federation on environmental protection and ensuring the inevitability of punishment for environmental crimes and other offenses [2,9].

When solving the problem of ensuring environmentally oriented economic growth and introducing environmentally efficient innovative technologies, the following mechanisms are used:

- the formation of an effective, competitive and environmentally oriented model of economic development that provides the greatest effect while preserving the natural environment, its rational use and minimizing the negative impact on the environment;
- introduction of innovative resource-saving, environmentally friendly and efficient technologies based on a single technological platform with the active participation of the state, business community, scientific and educational organizations, public associations and non-profit organizations;
- accounting of absolute and specific indicators of the efficiency of natural resources and energy use, negative impact on the environment in the state regulation of environmental protection activities and planning of measures for environmental protection, as well as in assessing the efficiency of the economy as a whole and by industry.

RESULTS

The air quality in the Krasnodar Territory is determined by the volumes of emissions of pollutants from stationary and mobile sources, with the dominant value being the volumes of emissions from mobile sources, although compared with previous years, the share of their content has slightly decreased [3,14].

In this case, it is necessary to use official sources of information, including:

- databases of the Unified Interdepartmental Information and Statistical System (EMISS) of the Federal State Statistics Service of the Russian Federation;
- materials prepared by the Federal Service for Supervision of Natural Resources, containing data on emissions of pollutants (pollutants) into the air from stationary sources according to the form №. 2-TP (air) of the federal statistical observation for 2018 (output forms do not contain information on all types pollutants, including in the context of municipalities).

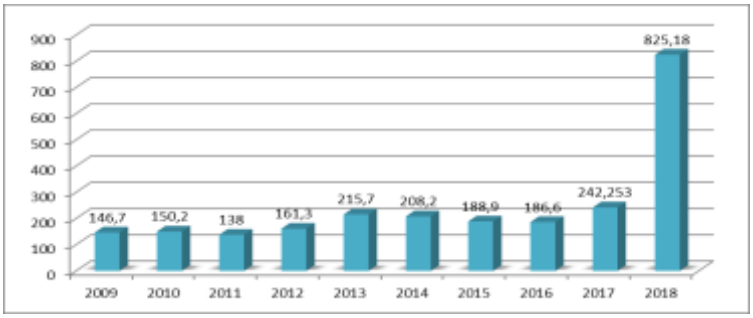

Figure 1: Dynamics of emissions of pollutants from stationary sources in the region

The total mass of pollutants emitted without treatment is 820,466 thousand tons (including 728,869 thousand tons from organized sources), which is 51.3% of the gross emission. [5,11]

Table 1: Amount and shares of waste and airborne pollutants from stationary sources of pollution

	Total pollutants emitted into the atmosphere in 2018	In% of the total amount of pollutants emitted into the atmosphere
Pollutant emissions	825,18 (in 2017 - 426,768) (in 2016 - 242,253)	51,62
Sulfur dioxide emissions (SO2)	7,994 (in 2017 – 7,21) (in 2016 - 7,780)	0,50 (in 2017 - 0,43) (in 2016 - 0,51)
Emissions of nitrogen oxides (NOx) (converted to NO2)	36,885 (in 2017 - 31,427) (in 2016 - 29,204)	2,37 (in 2017 – 7,36) (in 2016 - 12,05)
Carbon monoxide (CO) emissions all around the edge	238,23 (in 2017 - 53,628) (in 2016 - 53,628)	14,96 (in 2017 – 12,56) (in 2016 – 12,56)
Emissions of solid pollutants	508,849 (in 2017 - 11,083) (in 2016 -13,825)	31,83 (in 2017 – 2,59) (in 2016 - 5,71)
HC emissions (including VOCs)	397,91 (in 2017 – 397,91) (in 2016 - 51,402)	24,89 (in 2017 – 12,51) (in 2016 - 21,22)

In 2017, the treatment facilities received 777,793 thousand tons of pollutants, of which 773,078 thousand tons were captured and neutralized, which is 48.37% of the total mass of pollutants in emissions.

The dynamics of changes in the volume of emissions for each of the above substances in recent years is characterized by small fluctuations, in 2018 there was an increase in the amount of emissions of carbon monoxide, VOCs and solids. For all other pollutants, there is (to a greater or lesser extent) an increase in emissions into the air, the most significant increase was provided by other substances included in the reporting [6,15].

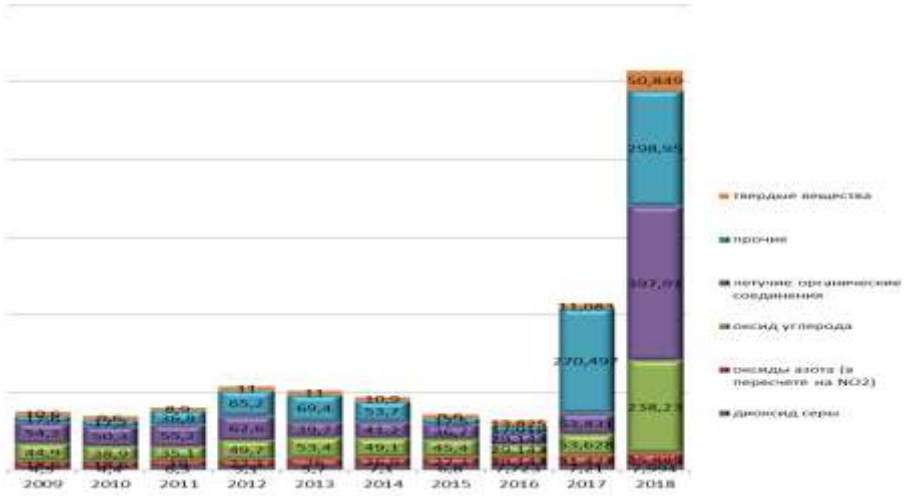

Figure 2: Dynamics of emissions of gaseous and liquid pollutants from stationary sources

* *твердые вещества- solids*
прочие- others
летучие органические соединения- volatile organic compounds
оксид углерода- carbon monoxide
оксиды азота (в пересчёте на NO2)- nitrogen oxides (in terms of NO2)
диоксид серы- sulfur dioxide

Comparative analysis of pollutant emissions on the territory of the Krasnodar Territory with emissions in total throughout the Russian Federation and the Southern Federal District shows that in 2018 the amount of pollutant emissions from stationary sources of pollution, in percentage terms, is 2,5/76,18 (in 2015 – 2,1/46,1, in 2016 – 1,16/34,4), respectively, and in total emitted into the atmosphere in 2018 – 4,8/75,22 (in 2015 – 1,1/29,4, in 2016 – 1,65/35,23).

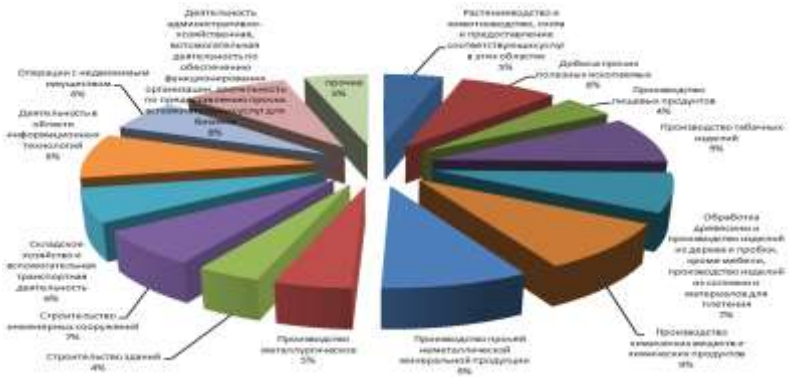

Figure 3: Pollutants caught and neutralized from enterprises of various types of economic activity in atmospheric air pollution in 2018

Table 2: Emissions of pollutants into the air from stationary facilities of enterprises.

	Number of pollutants	Including thrown away without cleaning		Comes for cleaning	Of these, captured and rendered harmless		Total pollutants emitted into the atmosphere		Trapped in% pollutants	Utilized in% to captured
		Total	emissions		Total	reclaimed	For the year report	last year		
Total	63816,769	15421,692	12752,958	48395,077	46748,676	24015,195	17068,093	-	73,3	51,4
Southern Federal District	2098,154	1081,77	931,044	1016,380	1001,18	594,636	1096,968	-	47,7	59,4
Krasnodar	1598,258	820,466	728,869	777,793	773,078	425,171	825,180	-	48,4	55,0
% select	2,504	5,320	5,715	1,607	1,654	1,770	4,835	-	-	-
dew in RF	76,175	75,844	78,285	76,526	77,216	71,501	75,224	-	-	-

The share of atmospheric air pollution in relation to the Russian Federation is insignificant, but in relation to the Southern Federal District it is two-thirds of all emissions, which is probably due to changes in the procedure for collecting and processing statistical information data by government authorities, while 48% of pollutant emissions are captured, and 55 % of pollutant emissions are recycled [10].

According to federal statistics (the source of information is the EMISS database of the Federal State Statistics Service of the Russian Federation - the Federal Service for Supervision of Natural Resources (Rosprirod-supervision of the Russian Federation), the volume of emissions from vehicles in the Krasnodar Territory amounted to 1,127.82 thousand tons in 2018 (in 2016 - 562,2 thousand tons) of pollutants (tables 3).

Table 3: The volume of emissions of harmful (polluting substances) into the air from road transport thousand tons

	RF	Southern Federal District	Krasnodar region	Krasnodar Territory in% relative to the Russian Federation and the Southern Federal District	
				RF	Southern Federal District
Total	30 215,28	3 397,88	1 127,82	3,73	33,19
Nitrogen dioxide	1 647,7	188,9	62,8	3,81	33,25
Ammonia	40,11	4,91	1,6	3,99	32,59
Sulfurous anhydride	85,28	9,48	3,2	3,75	33,76
Total	15 107,8	1 699,1	563,9	3,73	33,19

Volatile organic compounds	1 543,7	175,5	58,2	3,77	33,16
Methane	61,85	6,85	2,3	3,72	33,58
Soot	28,14	3,04	1,02	3,62	33,55
Carbon oxide	11 700,7	1 310,1	434,8	3,72	33,19

Analysis of the dynamics of emissions from stationary sources of the region showed that for the period from 2000 to 2017, the anthropogenic load on the atmospheric air from stationary sources increased significantly in comparison with 2000 by almost 4.4 times, and reached the level of 2011. Air pollution by emissions of pollutants from mobile sources, still the main cause of air pollution in the settlements of the Krasnodar Territory is the release of a significant amount of harmful substances from mobile sources (primarily from road transport). According to information received from the State Traffic Safety Inspectorate of the Central Internal Affairs Directorate for the Krasnodar Territory, the level of motorization in the region continues to remain quite high and far exceeds the national average. The total number of vehicles registered in the territory of municipalities of the region as of 01.01.2019 is 2350022 units (in 2017 - 2314065 units), of which cars and trucks and buses in the amount of 2172987 units (in 2017 - 2032199 units). Passenger cars account for 76.5% of the total number of vehicles, and most of the cars (96.62%) are owned by individuals, and trucks make up 9.9% of the total number of vehicles. If we consider the volumes of emissions comparatively, then on a national scale, these are not very large volumes (3.73%) in relation to the Southern Federal District, a significant figure - almost 33% of the total volume of emissions. Most of all pollutants are emitted into the air in Krasnodar.

DISCUSSIONS

When solving the problem of preventing and reducing the current negative impact on the environment, the following mechanisms are used:

- environmental regulation based on technological standards, provided that an acceptable risk to the environment and public health is ensured;
- gradual elimination of the practice of establishing temporary excess emissions and discharges of pollutants into the environment;
- reduction of specific indicators of emissions and discharges of pollutants into the environment, waste generation by type of economic activity to a level corresponding to similar indicators achieved in economically developed countries;
- the establishment of the obligation to conduct a state environmental review of design documentation for environmentally hazardous facilities, including radiation, chemical and biological hazardous facilities;
- improving the procedure and methodology for assessing the impact on the environment and taking it into account when making decisions at all levels, including harmonizing the procedure for conducting such an assessment in accordance with international treaties of the Russian Federation and creating a regulatory and legal framework for strategic environmental assessment;
- an increase in the volume of construction of buildings and structures certified in the system of voluntary environmental certification of real estate objects, taking into account the international experience of applying "green" standards;
- implementation of measures provided for by the Climate Doctrine of the Russian Federation and documents aimed at its implementation.
- When solving the problem of restoring disturbed natural ecological systems, the following mechanisms are used:
- an inventory of territories in order to identify areas with an unfavorable environmental situation for the implementation of programs aimed at minimizing negative impact on the environment and eliminating environmental damage associated with past economic and other activities;
- organization of work on the assessment and step-by-step elimination of environmental consequences of past economic and other activities;
- development of legal, economic, organizational and methodological mechanisms of compensation for harm caused to the environment;
- preservation and restoration of protective and environment-forming functions of natural ecological systems outside specially protected natural areas.

- When solving the problem of ensuring environmentally safe waste management, the following mechanisms are used:
- prevention and reduction of waste generation, their involvement in repeated economic circulation through the fullest possible use of raw materials and materials, prevention of waste generation at the source of their generation, reduction of the generation and reduction of the hazardous waste level, use of the generated waste through processing, regeneration, recovery, recycling;
- introduction and application of low-waste and resource-saving technologies and equipment;
- creation and development of infrastructure for environmentally safe disposal of waste, their neutralization and disposal;
- gradual introduction of a ban on the disposal of waste that has not undergone sorting, mechanical and chemical treatment, as well as waste that can be used as secondary raw materials (scrap metal, paper, glass and plastic containers, car tires and batteries, and others);
- the establishment of manufacturers' responsibility for the environmentally safe disposal of their products, represented by finished products that have lost their consumer properties, as well as related packaging;
- ensuring environmental safety during storage and disposal of waste and carrying out work on environmental restoration of the territories of waste disposal facilities after the completion of the operation of these facilities.
- When solving the problem of preserving the natural environment, including natural ecological systems, objects of the animal and plant world, the following mechanisms are used:
- strengthening the protection and development of a system of specially protected natural areas of federal, regional and local significance in strict accordance with their intended purpose;
- creation of an effective system of measures aimed at preserving rare and endangered species of flora and fauna and their habitats;
- formation and maintenance of sustainable functioning of systems of protected natural areas of different levels and categories in order to preserve biological and landscape diversity;
- preventing the uncontrolled spread of alien (invasive) species of animals, plants and microorganisms on the territory of the Russian Federation;
- preservation of the genetic fund of wild animals;
- solving environmental problems of the Baikal natural territory, regions of the North and the Arctic, territories of traditional nature management of the indigenous peoples of the North, Siberia and the Far East.
- When solving the problem of developing economic regulation and market instruments for environmental protection, the following mechanisms are used:
- setting fees for negative impact on the environment, taking into account the costs associated with the implementation of environmental protection measures;
- Replacement of the practice of charging fees for over-limit pollution of the environment with the practice of compensation for harm caused to the environment;
- stimulation of enterprises implementing programs for the environmental modernization of production and environmental rehabilitation of the relevant territories, as well as ensuring the widespread use of public-private partnerships with state funding (co-financing) of measures to improve environmentally unfavorable areas, eliminate environmental damage associated with past economic and other activities;
- formation of a market for environmentally friendly products, technologies and equipment, as well as environmental services;
- implementation of support for technological modernization, ensuring a decrease in anthropogenic load on the environment, sustainable use of renewable and rational use of non-renewable natural resources;
- development of market instruments for environmental protection and environmental safety;
- providing advantages (other things being equal) when placing orders for the supply of goods, performance of work, provision of services for state and municipal needs, goods, works, services that meet the established environmental requirements;
- stimulating the attraction of investments to ensure the rational and efficient use of natural resources, reduce the negative impact on the environment, produce environmentally friendly products, introduce resource-

saving technologies that meet the requirements of the legislation of the Russian Federation on environmental protection;
- phased implementation of a system for declaring compliance with environmental requirements and conducting environmental audits;
- increasing the environmental and social responsibility of business;
- stimulation of activities for the collection, sorting and use of waste as secondary raw materials and energy carriers;
- state regulation of the import into the Russian Federation of machinery (equipment) and technologies that do not meet environmental requirements, including international.

CONCLUSION

The main mechanisms for the implementation of state policy in the field of environmental development in solving the problems of forming an effective management system in the field of environmental protection and ensuring environmental safety, providing for the interaction and coordination of the activities of public authorities, the following mechanisms for the implementation of state policy in the field of environmental development (hereinafter - mechanisms):

- improving the delineation of powers of state authorities in the field of environmental protection and environmental safety;
- the establishment of such a criterion for assessing the effectiveness of the activities of public authorities, as the state of the environment and ecological safety in the relevant territories, determined on the basis of a system of objective indicators and indicators;
- increasing the efficiency of state environmental supervision at the federal and regional levels;
- introduction into the environmental quality management system of the methodology for determining and assessing environmental risks in order to increase the validity of management decisions.

GRATITUDE'S

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