



IMPROVEMENT OF THE SYSTEM FOR ACCOUNTING OF ECOLOGICAL AND SOCIAL COSTS FOR ENVIRONMENTAL PROTECTION IN RUSSIAN REGIONS


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***Abstract:** The proposed article concerns the issues of the "green economy" and the proposal of practical solutions in the field of solving the problem of waste management and the search for alternative sources of renewable energy. The article discusses the issues of organizing and maintaining analytical accounting of environmental payments in order to simplify reporting, increase investment attractiveness in accordance with the requirements of Russian legislation and international standards. The purpose of this research is to develop a methodology for classifying environmental costs into specific groups to improve the principles of sustainable development of Russian business. The subject is the accounting system for environmental investments in environmental protection in the Russian Federation. In the process of research, the authors used the following scientific methods: analysis, grouping, synthesis, analysis of the legal framework and deduction. The result of the research was developing of a detailed classification of groups of environmental and social costs aimed at increasing the financial sustainability of Russian business sectors.*

Key words: *current costs, environmental payments, environmental accounting, "green economy", investors*

JEL codes: *B15, B41, C18, M20, M42.*

1. Introduction

The issues of environmental sustainability, lean consumption and separate waste collection are increasingly on the agenda of the world powers. In September 2015, the UN identified 17 sustainable development goals (www1) and 169 targets to achieve them, which the world community must address by 2030. The 12 goal is determined by the need to guarantee the stability of consumption and production. This goal is aimed at rational use and conservation of natural resources, reduction of environmental pollution and implies the need to replace the traditional linear economic model with a resource-efficient model of a closed cycle - a circular economy - an economy of innovation, both technical and social.

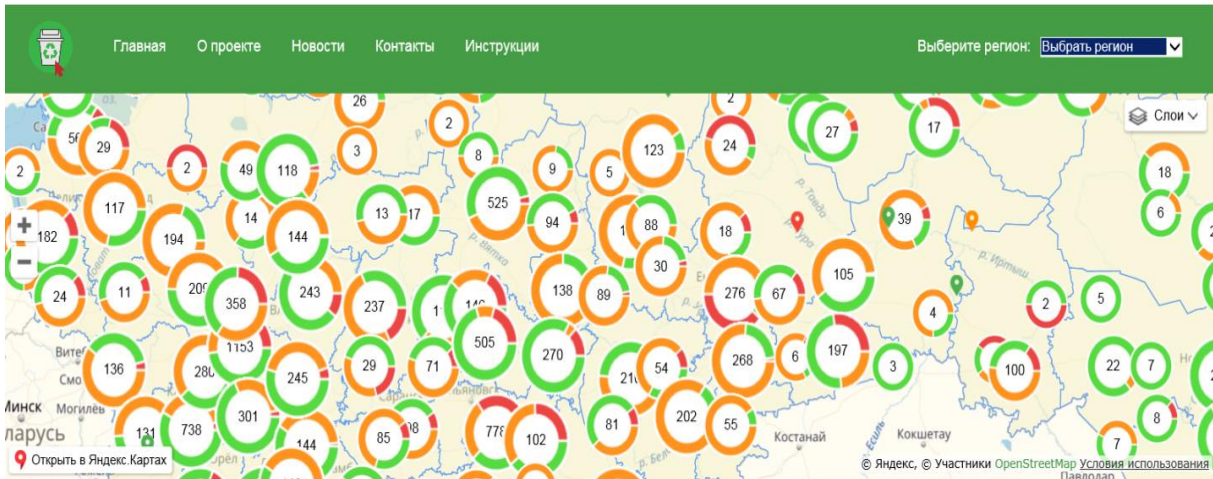
The US-chaired International Climate Change Summit in April 2021 demonstrates the growing role of sustainable environmental and social policies and measures to combat climate change (www2). Based on its results, were identified the key measures aimed at combating harmful effects on the environment. Emissions from transport are one of the sources of air pollution along with emissions from activities in the field of energy production, industry, agriculture. Garbage dumps - the growth of dumps of various wastes, leading to heavy metal pollution of water, soil, plants. Unsustainable consumption leading to global warming, the consequences of which can lead to the loss of agricultural land, lack or deterioration of the quality of water supply, etc. Along with global environmental problems, Russia is faced with the problem of environmental degradation: inefficient use of natural resources, lack of infrastructure for waste management, deterioration of environmental equipment, use of low-quality raw materials and fuel, savings on environmental measures, insufficient control and a low level of environmental awareness of the population.

The basic law of the Russian Federation establishes the right of citizens to a safe natural environment and the obligation to preserve it, therefore, back in 2002, the Federal Law "On Environmental Protection" (www3) came into force, the main goal of which is to regulate social and environmental issues aimed at preserving the natural environment and biodiversity, taking into account the interests of citizens and society. Back in 2019, at the UN Climate Summit in New York, Russia announced its accession to the 2015 Paris Climate Agreement, which replaced the Kyoto Protocol, which led to the development of a widespread national project "Ecology", according to which waste recycling, forest protection and water bodies at the state

level will be spent 56 billion rubles, which will radically improve the ecological situation in the country. At the end of the 2021 climate summit, Russia adopted a plan to reduce greenhouse gas emissions by 2030 by 70% compared to 1990 and plans to develop a strategy for low greenhouse gas emissions by 2050. The main regulator of this project will be the Ministry of Economic Development. The draft Social and Economic Development Strategy and the draft law "On limiting greenhouse gas emissions" have been published for public comment so that all stakeholders can express their views on these issues (www4). As a result of the aggravation of environmental problems, the need for an effective environmental policy is growing, the main goal of which is to form a system of analytical indicators, on the basis of which it would be possible to conduct a statistical analysis of environmental safety and cost effectiveness of environmental protection. For Russia, the issues of garbage dumps are still topical. For several decades, significant efforts in the world directed towards achieving rational use of resources and the development of environmental responsibility. In Russia, all these aspirations have brought only insignificant results, since "the ecological rationality of enterprises is impossible in the conditions of the irrationality of society"(www4).

The events of 2018 in the Moscow region, when 50 children from different schools in Volokolamsk turned to doctors after a powerful release of hydrogen sulfide occurred at the Yadrovo garbage dumps, a tragic but vivid confirmation of the ineffective work of the authorities in organizing work with the processing of solid municipal waste. According to the Federal Service for Supervision of Natural Resources (www5), 9 months before this tragedy, it stated that the problem of waste management is one of the most socially significant, practically for all constituent entities of the Russian Federation. In total, more than 5 billion tons of industrial and consumer waste of I-V hazard classes are generating annually on the territory of the Russian Federation. The scale of the garbage dumps in Russia can see using an interactive garbage dumps map, Fig. 1.

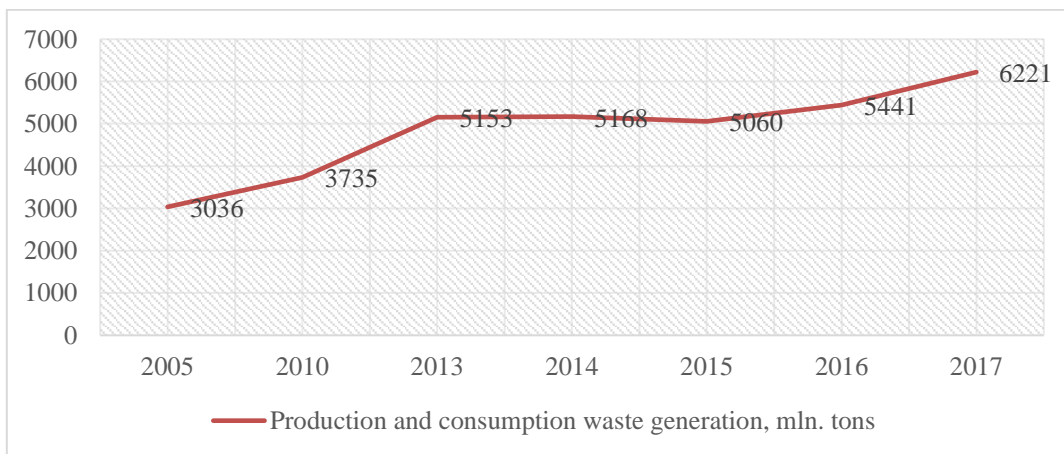
Fig. 1 The garbage dumps in the European part of Russia



Source: (Erokhina, Karagod, Golubeva, 2018)

Including, about 35-40 million tons of solid municipal waste are generated, or in volume units of more than 200 million m³. It should be noted that the indicated volume is from the population only. Every year, Russians throw out 70 million tons of household waste, which is 10 times the weight of the Cheops pyramid (6.2 million tons) (www6). At the same time, solid waste is generated from small and medium-sized businesses, non-residential stock, large industries, so the real figure is much higher, Fig. 2.

Fig. 2 Production and consumption waste generation, mln. tons in Russia

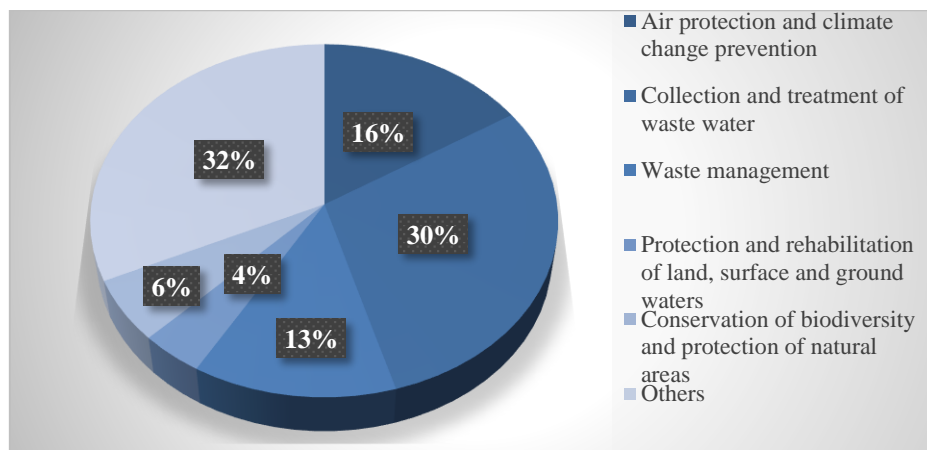


Source: (Erokhina, Karagod, Golubeva, 2018)

Almost all of this volume is subsequently disposed of at garbage dumps for solid domestic waste, as well as at authorized and unauthorized dumps. The number of unauthorized garbage dumps, unfortunately, is more than 2 times higher than the number of legal waste disposal sites.

According to Rosstat, the volume of spending on environmental protection in the Russian Federation in 2019 amounted to 871993 million rubles, which is 0.8% of the country's GDP. The total operating costs of environmental protection in Russia in 2019 amounted to 374,411 million rubles, of which the largest amount of costs recorded at industrial enterprises - 149,866 million rubles (40%). Water supply, sewerage, waste collection and disposal companies, pollution elimination - 113,496 million rubles, occupy the second place. (30 %). The third position in the information on environmental protection measures in the sectoral context occupied by the extraction of minerals - 57,037 million rubles (15 %). An insignificant amount of expenses was noted by the types of activities: provision of electricity, gas and steam, air conditioning - 24581 million rubles, agriculture, hunting, fishing and fish farming - 2339 million rubles, construction - 1999 million rubles. The structure of expenses can be shown in the Fig.3.

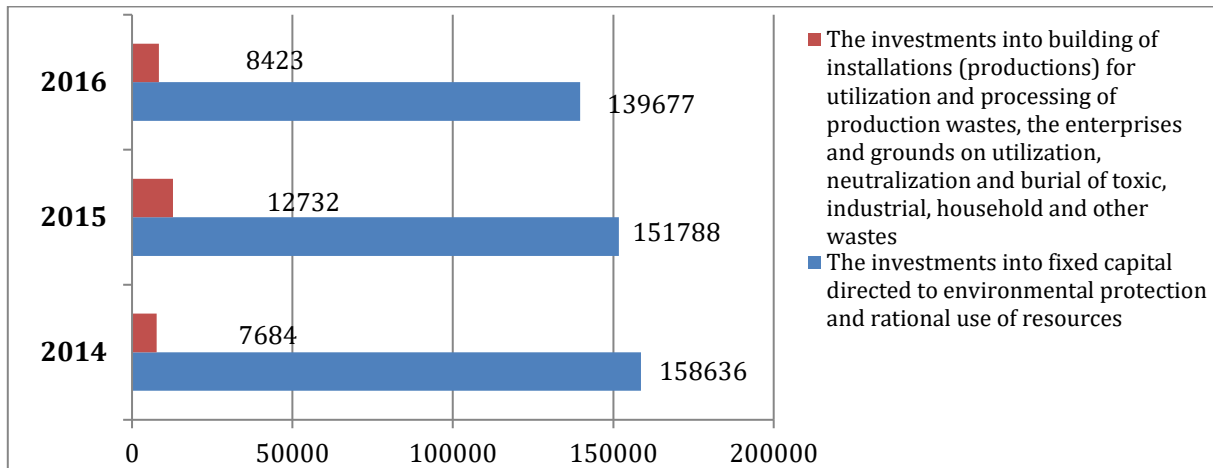
Fig. 3 Structure of investments in environmental protection activities in Russia, 2019



Source: (www7)

It can be noted that, investing in waste incineration technologies with subsequent disposal, these processes can hardly be attributed to the processes of a circular economy due to the destruction of resources and energy, an increase in emissions of harmful substances into the air and pollution of groundwater. At the same time, the scientific and practical elite states that the adopted utilization standards lag significantly behind similar indicators in developed countries. Analysis of the dynamics of investments in fixed assets for environmental protection indicates a tendency for an annual decline, which does not inspire optimism in the speedy achievement of the legislatively designated goals, Fig. 4.

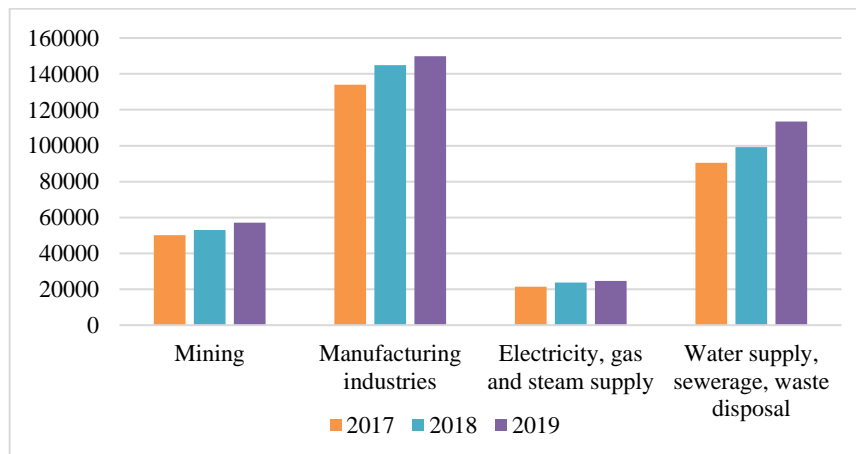
Fig. 4 Investment in fixed assets aimed at environmental protection



Source: compiled by the authors

Rosstat uses for data collection the Classifier of the types of environmental protection activities, which combines the following areas: protection of atmospheric air; wastewater treatment, waste management, soil protection and rehabilitation, noise and vibration reduction, biodiversity conservation, radiation safety, research and development and other areas. Fines for violation of environmental legislation, compensation for damage and compensation from third parties are not taken into account, since they are not related to environmental protection activities (Fig. 5).

Fig. 5 Dynamics of expenditures for environmental protection activities by industry, in million rubles

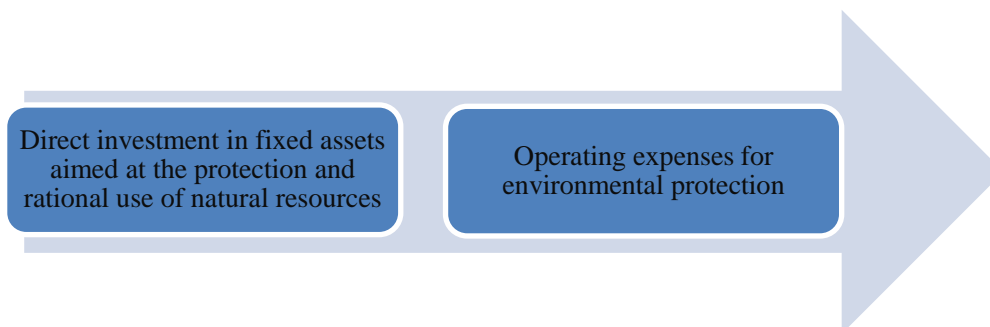


Source: (www8)

Methodological recommendations on the formation of indicators of environmental protection costs, taking into account international experience, developed by Rosstat, contain an algorithm for the formation of the indicator "Total costs of environmental protection" based on

the principle of summing up costs by type of costs. Consequently, environmental accounting can be built on the basis of accounting, systematizing information on the costs of environmental safety in such a way as to prepare information both for external reporting and within the organization without hiding these costs in total costs. The structure of environmental protection costs in the regions of the Russian Federation is shown in Fig. 6.

Fig. 6 The structure of environmental protection costs in the regions of the Russian Federation



Source: compiled by the authors

Direct investments include the costs of new construction, expansion, reconstruction and modernization of industrial and social facilities.

Operating costs are understood as operating costs:

- to protect the environment;
- for the maintenance of nature reserves and national parks;
- for the protection and reproduction of the animal world;
- for research work;
- for education and enlightenment;
- for public administration.

The reliability and accuracy of information on costs is achieved by the procedures for organizing analytical accounting of environmental protection costs, creating reserves for environmental protection costs and developing internal reporting forms for environmental protection costs, which will lead to the creation of environmental accounting within the framework of accounting and management accounting.

1.1 Reflection of environmental costs in accounting in the Russian Federation

The applied methods and procedures for accounting for environmental and social costs are reflected in the accounting policy of the organization. Payments for environmental pollution

and other types of impact, in excess of the norms, are calculated according to the data presented in the statistical reporting of the enterprise, based on approved methods (Resolution of the Government of the Russian Federation "On the calculation and collection of payments for negative impact on the environment" (www9), Resolution Of the Government of the Russian Federation "On rates of payment for negative impact on the environment and additional factors" (www10), Resolution of the Government of the Russian Federation "On the procedure for collecting environmental fees" (www11)).

The procedure for reflecting current environmental costs in the accounting is carried out in accordance with Accounting Regulations 10/99 (www12) payments for environmental pollution in accounting should be considered expenses for ordinary activities related to the manufacture and sale of products, performance of work, provision of services.

When reflecting environmental payments in accounting, one should pay attention to the fact that the occurrence of environmental obligations to the budget is reflected in the credit of account 68, with the corresponding subaccount. Also, environmental payments are a type of environmental costs that are reflected in the debit of production accounts as part of overhead costs - account 26, or can be attributed to accounts 20, 29, 44, depending on the organizational structure of the enterprise, Table 1.

Tab. 1 Reflection of environmental payments in accounting

Account	Debit	Credit
	26	68, subaccount environmental payments to the budget
	Or 20	
	Or 29	
	Or 44	

Source: compiled by the authors

Control over the formation of expenses for accounting purposes and for taxation purposes is implemented through the allocation of costs in the accounts: "Within the established limit", "Over the established limit"; "Within the limits of permissible standards", "Above permissible standards", which will facilitate the organization of accounting, as the amounts accumulated on these subaccounts, taking into account the excess and excess fees, will not be accepted in determining the taxable base.

For the purposes of tax accounting and taxation of profits, on the basis of the Tax Code of the Russian Federation (www13), the amount of taxes and fees is usually attributed to other expenses related to production and sale. The exception is the amount of payments for excess emissions and discharges of pollutants and excess waste disposal. The listed expenses relate to expenses that are not taken into account for the purposes of income taxation.

In addition to payments for harmful effects on the environment, environmental payments include payments for water taken from water management systems, for the right to use water bodies, for the right to use subsoil, one-time payments upon obtaining a license for the right to use subsoil. Current costs associated with the maintenance and operation of environmental funds: treatment facilities, ash collectors, filters and other environmental facilities are to be included in the corresponding items of production costs.

In our opinion, it is necessary to take into account as the costs accepted for profit, the costs of paying for the services of specialized organizations for the development and adjustment of draft standards, as well as the costs of paying for services for the development of an enterprise's environmental passport.

Environmental capital expenditures accounted for in accordance with the general procedure adopted for accounting for capital expenditures. For this, account 08 "Investments in non-current assets" is used. The debit reflects all the costs of acquiring an item of fixed assets (payment on suppliers' invoices, delivery costs, payment of interest on a loan before posting the item, etc.) Subaccounts and analytical accounts is opening for account 01 in business practice, Table 2.

Tab. 2 Accounting for environmental capital expenditures

Account	Debit	Credit
	08	02,10,16,26,60,68,69,70,76
	01	08, subaccounts

Source: compiled by the authors

For fixed assets of environmental protection, timely reconstruction or modernization is of particular importance. Unlike current repairs, modernization implies an increase in the cost of fixed assets and leads to a change in the performance of an object, the emergence of new opportunities for it, and a change in the useful life.

Accordance with the Federal Law "On Industrial Safety of Hazardous Production Facilities" (www14), an organization operating a hazardous production facility is obliged to

insure liability for harm to life, health or property of others and the environment in the event of an accident at a hazardous production facility.

One of the negative events for Russian environmental and social responsibility was the fuel spill in Norilsk in 2020, when the environmental damage amounted to over \$ 2 billion (www15). Rosprirodnadzor of Russia has published the results of an unscheduled inspection of JSC NTEC, which is part of Norilsk Nickel, the culprit of this disaster. The department found that the company had violated environmental legislation, and also provided false information in the declaration on the impact on the environment, which significantly aggravated all environmental and social initiatives of our country. The liquidation of the environmental damage caused by Norilsk Nickel was carried out at its own expense, as well as at the expense of its liability insurance.

Expenses for compulsory civil liability insurance of an organization operating a hazardous production facility are expenses for ordinary activities and are included in the cost of goods sold, works (Accounting Regulations "Organization Expenses" 10/99). On its basis, expenses are recognized in the reporting period in which they occurred, regardless of the time of the actual payment of funds and other form of implementation.

Voluntary environmental insurance is carried out by enterprises at the decision of their leaders. If the organization paid the insurance premium in accordance with the terms of the concluded insurance contract, at a time in the reporting period for the next 12 months, then the expenses incurred by the organization in the reporting period under the insurance contract relating to the following reporting periods are reflected in the debit of account 97 "Deferred expenses".

Expenses under the insurance contract, accounted for on account 97 "Deferred expenses", are written off by the organization to the debit of account 20 "Main production" in the manner established by the organization (for example, monthly), during the period to which they relate, that is, during the period validity of the insurance contract. The Tax Code of the Russian Federation "Expenses for compulsory and voluntary property insurance" identifies "voluntary insurance of liability for damage if such insurance is a condition for the taxpayer to carry out activities in accordance with the international obligations of the Russian Federation or generally accepted international requirements" and states that "costs of voluntary types of insurance are included in other expenses in the amount of actual costs".

The main principles of the functioning of the environmental insurance system include the following.

1. Environmental insurance should be considered as an element of ensuring environmental safety only if it does not encourage environmental irresponsibility of the insured by compensating for his losses in any situation.

2. Compensation for the damage caused should be in favor of the victim, but not the culprit of harmful emissions or accident.

3. Environmental insurance should not be calculated to insure the consequences of environmental disasters caused by willful negligence at work or criminal acts. The determination of this factor as the cause of pollution should be made by the insurance company in cooperation with the state environmental authorities.

4. The presence of mutual interest of the insurer and the policyholder in the prevention of accidents and damage from environmental pollution, expressed in close cooperation in the implementation of preventive emergency measures.

Another type of environmental expenditure is environmental impact assessment. According to the Federal Laws "On Environmental Expertise" (www16) "On Environmental Protection" (www3), environmental expertise is understood as establishing the compliance of the planned economic or other activity with environmental requirements and determining the admissibility of possible adverse impacts of this activity on the environment and related social, economic and other consequences as a result of the implementation of the object of environmental impact assessment. In the Russian Federation carrying State ecological expertise and public ecological expertise. An independent, objective, non-departmental assessment of the compliance of the activities of economic entities and the state of the environment with the requirements of the current environmental legislation, regulatory and legal acts, methodological and regulatory documents in the field of environmental protection and nature management constitutes the concept of environmental audit.

Based on the research, it was determined that the presented list of environmental costs is far from completeness, and the existing classifications of costs do not sufficiently developed in science and practice. However, the constantly changing economies of the superpowers, major environmental disasters in recent years - all this testifies to the relevance of the chosen research vector, as well as the need for a more thorough improvement of the system of accounting for environmental and social costs for environmental protection in the regions of Russia.

2. Methodology and Data

In the process of the research, the authors used following scientific methods: analysis, grouping, synthesis, analysis of the legal framework and deduction.

An important role in the study is played by a review of the literature on environmental and social accounting and its applicability for the Russian economy, as well as issues of lean consumption and sustainable development of Russian regions and sectors of the economy: (Kazakova et al, 2016, 2020), (Erokhina, Karagod, Golubeva , 2017, 2018), (Kogdenko et al, 2020), (Melnik et al, 2020), (Rodionova & Kokuytseva, 2020), considering approaches to classifications of environmental and social costs for Russian business sectors and measures to minimize associated environmental risks.

Among foreign authors, there are also many studies on environmental accounting, reporting and assessment of environmental and social costs: (Iyyanki V. Muralikrishna & Valli Manickam, 2017), (Mathews, 1997), (Weber, 2018) and others. The reliability and accuracy of information on costs is achieved by the procedures for organizing analytical accounting of costs for nature conservation, creating reserves for costs for environmental protection measures and developing forms for internal reporting on costs for environmental protection measures, which is reflected in the accounting policy.

Methodological developments considering the position of existence and assessment of environmental and social costs are presented in the Environmental and Social Policy of the European Bank for Reconstruction and Development (www17), in the Report on Environmental Priorities for Russia by the Analytical Center under the Government of the Russian Federation (www18), in UN documents (www19) and the calculated "Ecological and economic index of the regions of the Russian Federation" (www20). Despite the sufficient information and regulatory framework, it is necessary to develop and implement practical approaches aimed at improving the system of accounting for environmental and social costs of environmental protection.

3. Results and Discussion

Based on the study of the ecological state of the regions of Russia, as well as an analysis of sources and existing approaches to the classification of environmental and social costs, as well as the lack of methodological tools for reflecting environmental costs, the authors proposed a method for classifying environmental and social costs into the following groups: environmental and social obligations (natural resources , environmental and other types of payments that have

a direct or relative connection with the environmental and social activities of the enterprise); capital investments; current costs and costs of the operational level of management of the environmental and social activities of the enterprise, presented in Table 3.

Tab. 3 Methodology for the classification of environmental and social costs by groups

Environmental and social costs	Capital investments in environmental facilities	Current costs in business processes	Costs in the process of carrying out environmental and social activities
Payments for the use of natural resources	Costs for the purchase, creation, reconstruction, technical re-equipment of treatment plants and facilities for water supply systems, installations for collection, transportation, processing and disposal of waste	The cost of measuring the parameters of production processes in order to reduce the harmful impact on the environment	Stoppages or interruptions of production at environmentally hazardous production areas or the occurrence of environmental accidents
Payments for the use and protection of natural resources	Introduction of low-waste industries, reduction of waste and emissions	Certification services and development of plans to improve the environmental sustainability of production	Occurrence of diseases associated with the implementation of professional activities
Payments for polluting emissions, waste, exceeding the limits and standards	Expenditures for scientific research of environmental protection, with the results obtained	Obtaining an ecological passport of the enterprise	Additional costs for payment of sick leave and temporary disability certificates and the cost of paying workers replacing sick people
Environmental insurance costs	Costs of obtaining knowledge-intensive patents	Costs for maintenance and preventive maintenance of equipment for direct environmental protection	Lost benefits due to temporary disability of staff and the impossibility of replacing them
Payment of sick leave and sick leave, payment of the cost of treatment of diseases caused by environmentally hazardous working conditions	Capital investments in fixed assets, intangible assets, costs of various natures for the modernization of production processes, characterized by a decrease in the harmful impact on the environment The totality of costs incurred in the preparatory stages of the implementation of production processes	The costs of creating an environmental service of the enterprise Costs of research and development for environmental purposes Expenses for training and retraining of personnel working in environmentally hazardous industries	Decreased labor productivity due to staff inefficiency Loss from equipment downtime or inefficient use of equipment The cost of staffing the enterprise, staff turnover due to hazardous production

	Costs for collection, processing, removal, disposal and disposal of waste	Costs to compensate for the loss of raw materials, semi-finished products, finished products, along with harmful emissions
	Costs for the creation of a sanitary protection zone, for the maintenance of green spaces and land reclamation, vacated as a result of changes in the production program	Compensation payments to persons affected by the activities of the enterprise
		Cost of correcting manufacturing defects Losses related to consumer complaints and complaints Low level of environmental safety of production

Source: developed by the author

The proposed author's version of the grouping of environmental and social costs can be used at most Russian enterprises that pursue purposeful activities towards the implementation of the principles of sustainable development and the introduction of the principles of a circular economy. Each enterprise should draw up a complete list of costs itself based on the compliance of the goals of the environmental and social strategy of the enterprise, certain measures to achieve these goals and a set of methods, principles, requirements formed by the accounting policy and the needs arising from the management of the enterprise to achieve sustainable development and socially responsible business conduct.

Obviously, for a complete analysis of the sufficiency and effectiveness of the funds spent, a greater amount of information on each category of costs will be required by their detailed division. This will entail accounting difficulties and high labor costs, but will contribute to the development of optimal solutions for environmental protection. Within the framework of environmental accounting:

- the accounting accounts will reflect the impact of environmental payments and risks on the financial position;
- compile information for potential investors about the real costs and benefits;
- evidence of product compliance with environmental safety requirements is formed.

Consequently, environmental and social accounting is the key to sustainable development of the economy of both an individual economic entity and the Russian Federation as a whole.

4. Conclusions

Summarizing the proposed results should note that the legislative initiatives of recent years and the intensification of state measures to solve problems with the disposal and reuse of waste in the Russian Federation not yet crowned with success in creating a basic basis for the transition to the principles of a circular economy.

At the same time, the authors acknowledge that the potential for a transition from a linear model of the economy to a more efficient closed model is great. It is necessary to change the instruments for stimulating investment activity in the vector of adherence to the principles of a circular economy, as well as provide state support to businesses in introducing environmental innovations in waste processing.

The result of the research was developing of a detailed classification of environmental and social costs groups, which aimed at increasing the financial stability of Russian business sectors.

Concluding the consideration of the accounting of the environmental costs of the enterprise, should be noted that the accounting information system of Russian organizations is far from perfect, the absence of a separate article in calculating the cost price and reporting significantly hinders the development of optimal management decisions, but gradual steps aimed at improving the methodological support of environmental and social accounting and reporting allows to make Russian regions more attractive for potential investors.

Acknowledgments

The article was prepared within the framework of research work on the topic "Monitoring of sectoral risks of financial security in the digital environment using the Harvard paradigm of industry analysis", carried out in the priority areas of scientific activities of the Plekhanov Russian University of Economics.

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