

GREEN ECONOMY DEVELOPMENT

Albina Berkaeva¹, Oksana Poltavets², Elana Avdeeva³, Kseniia Marakulina⁴,
Ksenia Zolotoreva⁵

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¹North Ossetian State University named
after K. L. Khetagurov, Vladikavkaz, Russia

²Financial University under the Government
of the Russian Federation, Krasnoyarsk Branch, Krasnoyarsk, Russia

³St. Petersburg Mining University of Empress
Catherine II (Mining Institute), St. Petersburg, Russia

⁴Moscow Technical University of Communications
and Informatics MTUCI Moscow, Russia

⁵Financial University under the Government
of the Russian Federation Moscow, Russia

d-albina@yandex.ru

OAPoltavets@fa.ru

elavtraum@gmail.com

k.a.marakulina@mtuci.ru

kgzolotareva@fa.ru

Abstract

Environmental risks are becoming increasingly relevant to the economy due to environmental degradation, climate change, resource exhaustion, and growing demands from the government and consumers. The solution to this problem lies in developing a green economy. This requires studying issues related to creating a state support mechanism for non-profit organisations' activities in green finance, as well as their participation in environmental projects through developing instruments of this type of financing. Education and raising awareness of the importance of sustainable development also play a key role in this process.

Keywords: green economy, responsible investment, environmental projects

I. Introduction

The rapid growth of the world economy in the 20th century put industry at the top of the list of development priorities [1]. This led to the strengthening of various types of economic growth, depending on the resources used. As a result, the environmental situation around the world became significantly less favorable. An awareness was formed of the narrowing of opportunities to continue economic growth based on the existing production and technological conditions.

In this regard, the need to review innovation policy was recognized, which should increase the activity of enterprises in terms of innovation and ensure economic growth. In such conditions, the concept associated with changing financial mechanisms on an ecological basis, with "green" financing, has become increasingly important. This concept provides for the need to generate demand for innovation.

Demand for innovations can be stimulated by the state [2]. The state has the ability to solve the corresponding problem by introducing special requirements, including labor regulations,

changes in legal and regulatory frameworks.

The measures implemented by the state are aimed at generating demand for innovations and integrating investment and scientific and technical solutions in the implementation of investment projects that are particularly significant.

II. Methodology

To ensure the equivalence of environmental and economic benefits, today it is necessary to form mechanisms for sustainable development that are comprehensive, environmental and economic.

A number of leading approaches have been formed in economic theory.

It should be noted that the participation of representatives of neoclassical economics in the study of relevant issues is significant, primarily as a result of studies in the middle of the last century [3]. Within the framework of these studies, many economic externalities were correlated with environmental resources. At the same time, researchers pointed to free access to a number of natural resources that are not owned by anyone (air, oceans, etc.)

The neoclassical approach is based on the interchangeability of all resources and on the optimal allocation of resources through the action of market forces. The possibility of caring for future generations is ensured through discounting. Additional challenges in maintaining a sustainable state of the natural environment are characterized as “market failures”. To solve these problems, mechanisms in the form of permit trading and taxation are proposed. In fact, this approach examines two key issues related to environmental protection, related to the management of environmental assets through policy instruments and the valuation of these assets.

The formation of the concept of ecological economics took place at the turn of the sixties and seventies of the last century. This concept was formed in its basic form by R. Costanza, G. Daly, J. Martinez-Alier, P.R. Hay [12]. The corresponding researchers proposed to interpret the economic activity carried out by people as an element of the natural system. They pointed to the need for the economy to correspond to the complex of natural limitations. The fundamental assertions on which this concept is based are as follows:

- it is necessary to recognize that nature is of great importance;
- it is necessary to consider the demographic changes that are taking place and how these changes affect ecological and socio-economic systems;
- the ethical aspects of economic activity should be taken into account, primarily how this activity affects the state of the natural environment, contemporaries and future generations;
- the sustainability of unlimited economic growth in ecological and social terms is low;
- there is a need for a more detailed analysis of the hidden value inherent in economic growth;
- it is necessary to recognize that from the point of view of sustainability, well-being in social, environmental, and economic terms, all types of capital (social, natural) are significant;
- more careful consideration of changes in economic and social systems is required, since the consequences of such changes may be unpredictable and irreversible.

Peter Robert Hay describes this approach in economics as a practical problem-solving approach that differs from the neoclassical school in its disdain for abstract modeling. It shifts attention from the micro-perspective to macro analysis and from short-term to longer-term perspectives. This school complements ecological actions and interactions harmoniously, making its approach more holistic and considering dynamic processes and changes, avoiding stagnation. Certain aspects of this approach seem impossible from a practical and ethical point of view, as the

integration of economic principles into the original context requires structured commitments to manage contextual connections.

This school of thought considers the size of the economy relative to the ecosystem as a key issue, with a particular focus on environmental challenges [7]. Ecological economists see the economy as part of the ecosystem and believe that it cannot be isolated from its context. Since ecosystems have limits and the economy belongs to them, it is necessary to limit economic growth to address environmental challenges.

They note the advisability of reducing the tax burden on all production resources except natural resources, and increasing it in relation to natural resources.

The policy measures they propose to implement are similar to those proposed by neoclassicists. At the same time, the post-Keynesian approach emphasizes that state participation in ensuring sustainable development should increase.

The corresponding approach assumes the identification of a number of environmental problems as fundamental. These problems are associated with limited replacement, uncertainty, and financial support for new investments.

The measures proposed within this approach are related to:

- the introduction of environmental standards, the direction of state expenditures to ensure the sustainability of the economy, including the need to protect the natural environment, and the stimulation of the transformation of consumer habits;
- the increase of the role of banking organizations in maintaining a favorable state of the natural environment based on increasing financial support for “green” projects and technologies with the provision of state guarantees for this financing (this measure is consistent with post-Keynesian ideas, according to which an increase in demand supported by investments contributes to economic growth);
- overcoming uncertainty through the formation of a strategy for preserving natural capital and the definition by the state of strategic goals in the form of low inflation and a balanced budget.

According to the neoclassical approach, environmental problems are presented in the form of externalities, and measures to solve them are presented in the form of permits and taxes.

Representatives of the concept related to ecological economics believe that due to the fact that the ecosystem is limited, economic growth is problematic. In this regard, it is proposed to control this growth, but in a market-type economy, the solution to this problem is associated with difficulties.

According to post-Keynesians representatives, “green” growth is limited due to a number of problems associated with insufficient investment in environmental projects and fundamental uncertainty

III. Results

Over the last decade, the topic of the “green economy” has become widespread. In a narrow sense, the “green” economy is understood as types of economic activity that, along with modernization and increased production efficiency, contribute to the improvement (or preservation) of the human living environment, including the reduction of technogenic emissions, and the adaptation of the population and the economic complex to changing climatic conditions. Today, such activities cover energy conservation and energy efficiency, development and exploitation of alternative energy sources, transport, agriculture and forestry, water management, solid waste management, construction of smart buildings and cities and a number of other areas, i.e., in a general sense, economic activity that improves people's well-being and ensures social justice, while significantly reducing environmental risks and depletion of nature.

The following principles can be considered as the main principles of the green economy:

- the principle of well-being;
- the principle of justice;
- the principle of planetary boundaries;
- the principle of efficiency and sufficiency;
- the principle of good governance;

The principle of well-being. The green economy is primarily people-oriented and its main goal is to create true prosperity for people. The main focus is on the growth of wealth, which will then lead to well-being. This is not only the growth of financial wealth, but also other types of human, social, material and natural capital. Priority in investments is given to stable natural systems and infrastructure, to education and knowledge. The direction is based on collective action to achieve public goods, while also considering and respecting the individual choices of each person.

The principle of justice. The green economy should fairly share the decision-making process, taking into account all benefits and costs, and avoiding the capture of goods and the emergence of elites. It should support the empowerment of women. That is, the green economy is non-discriminatory and inclusive. It is aimed to reduce differences between people, to create harmony between people and wildlife. It is based on solidarity and social justice, strengthening trust and social ties between people. It considers the interests and rights of workers, indigenous peoples and minorities.

The principle of planetary boundaries. A green economy must protect, restore and invest in nature. It recognizes and supports the various natural values, including the functional values that underlie the economy, the cultural values that form the basis for society and the ecological values that are fundamental for life on Earth. It invests in protecting and restoring natural diversity, the ecology of soil, water, air and all-natural patterns.

The principle of efficiency and sufficiency. The green economy should be aimed at supporting sustainable consumption and production. The green economy is low-carbon, resource-efficient, variable and cyclical. It implies new models of economic development; it seeks to limit the consumption of natural resources to acceptable levels. At the same time, it recognizes the importance of the need for a certain social level to ensure human well-being.

The principle of good governance. The green economy must be guided by sustainable, integrated and accountable institutions. It is evidence-based. Governance operates on the principles of transparency, social dialogue, democratic accountability and freedom from vested interests. The financial system of the green economy is designed in such a way that it can ensure the well-being, sustainability and security of public interests.

The term “green” finance refers to a set of financial products and services that focus on both reducing climate and environmental threats and increasing resource efficiency. These instruments include “green” investments, bonds, loans, insurance, funds, etc.

Historically, “green” bonds are considered as the most ancient and widespread form of “green” financing. These securities assume the receipt of fixed income, and are debt securities.

This is a type of fixed-income debt security that can raise money from investors in exchange for an obligation to repay it within a specified period of time and at a specified interest rate.

Issuers pledge to use the proceeds of these bonds to support or refinance projects that have a positive environmental or climate impact. These bonds are traded on specialized exchanges at a reduced interest rate and attract the attention of large financial institutions. Often, state and central banks subsidize interest rates on “green” initiatives, and pension funds are eager to invest in them. The “green” bond market has expanded significantly in recent years and includes such types as general issue bonds with guarantees, project and income bonds, asset-backed and covered bonds. The first “green” bonds were issued by the International Development Banks in 2007–2008,

and following the rapid growth of this market, the International Capital Markets Association launched the “Green Bond Principles” in January 2014.

At the same time, the “green” credit market is actively developing. Such a loan is a financial instrument intended for full or partial support of new and existing environmental projects. Unlike bonds, the market of “green” loans is relatively young both at the global and the national levels.

“Green investments” are presented in the form of property, securities, and cash that are invested in activities aimed not only at making a profit, but also at reducing the negative impact on the natural environment. These investments can, accordingly, be considered as financial instruments allowing to ensure a reasonable balance between the economy and the natural environment, increase the energy efficiency of economic activity, optimize production, and reduce the negative impact on the natural environment. The corresponding financial instruments can act as an effective means of implementing state policy, since they are characterized by the presence of a social element.

“Green” Insurance

The securities must be certified for compliance with certain criteria to be considered as “green”, which in turn gives them the opportunity to secure government support and a number of preferences. Active development of legislative regulation of “green” financing in the Russian Federation began in 2020. The state corporation VEB.RF was appointed as a methodological center for green financing. On September 21, 2021, the Government of the Russian Federation, in cooperation with the mentioned organization, adopted Resolution No. 1587, which provides a set of requirements for projects related to sustainable development and the criteria by which these projects are assessed. The Resolution provides, among other things, for a set of priorities and goals related to sustainable development.

In 2012, the vector of development of the domestic green economy was defined. The Head of the State approved a policy for Russia's development in terms of environmental protection for the period up to 2030. This document provides a set of fundamental requirements, goals, and objectives related to sustainable development. The relevant key provisions are intended to meet the needs of the country's population while preserving the natural environment, including for future generations.

This policy is primarily aimed at solving socio-economic problems, maintaining environmental safety, promoting economic development with a focus on environmental protection, strengthening law and order in the area of environmental protection, maintaining a favorable state of the natural environment, creating conditions under which each person could exercise the right to have a favorable environment, preserving natural resources and biodiversity taking into account the needs of existing and future generations.

The fundamental requirements for the implementation of environmental policy include the need to:

- respect the rights of citizens to receive reliable information on the state of the natural environment;
- respect the human right to a natural environment that is favorable;
- proceed from the fact that the proposed economic and other activities may threaten the natural environment;
- ensure living conditions that are favorable for citizens;
- ensure the responsibility of government bodies at the federal and regional levels, bodies operating at the municipal level, for ensuring environmental safety and a favorable environment;
- combine on a scientific basis the social, economic, and environmental interests of the state, society, and individuals to ensure environmental safety, a favorable environment, and sustainable development;
- preserve natural complexes, landscapes, and natural ecological systems as a priority;

- use natural resources reasonably, carry out their reproduction and protection to ensure environmental safety, a favorable environment, etc.

Sustainable development criteria apply to a variety of areas: wastewater disposal, water supply, energy, construction, transport, waste management, agriculture, etc.

IV. Discussion

The Russian economy has shown poor readiness for the transition to sustainable development, while remaining with an unstable and ineffective structure [19]. The level of negative impact on nature in the country is significantly higher than in technologically advanced countries, which is expressed by significant discrepancies and low use of available natural, scientific, technical and cultural resources. Many production facilities do not meet modern environmental standards, and ecologically unfavorable areas account for 16% of the country, where more than half of its population lives. Without the introduction of environmentally oriented approaches into the economy within the framework of institutional and structural reforms, it is impossible to achieve the goals of the concept of sustainable (“green”) development. It is necessary to widely implement environmentally oriented management practices, mass use of energy- and resource-saving technologies, and also to radically change the structure of the economy and consumer practices, the attitude of citizens to nature. Russia has all the resources needed to achieve the goals of the Sustainable Development Concept.

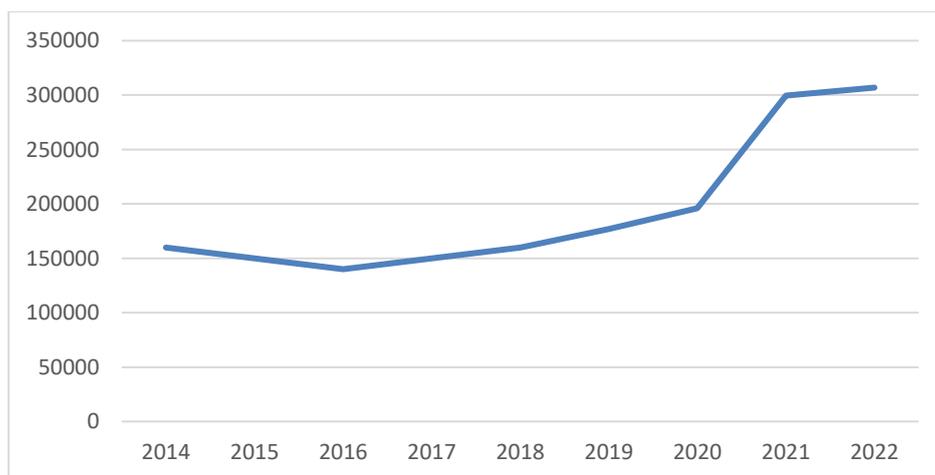


Figure 1: *Investments in fixed capital aimed at environmental protection and rational use of natural resources, million rubles.*

The latest programs aimed at increasing energy and environmental efficiency, improving resource conservation and developing alternative energy sources in the country are focused on introducing modern approaches to the “green” economy, considering national characteristics. Russia's transition to a sustainable path requires time and the solution of complex socio-economic and environmental problems, as well as significant financial resources and compliance with certain restrictions. In the current conditions, it is worth considering the “green” economy as the basis for the sustainable development of world civilization. Sustainability is a progressive development that ensures rational use of natural resources and harmonious cooperation with nature, as opposed to stability, which only leads to stagnation.

Even the most advanced technology should not be implemented if it does not meet the criteria of “green” technologies and harms the environment. Only by following this ecologically

and socially oriented doctrine the humanity will be able not only to survive, but also to rapidly develop in the future.

It is also worth to note that the dynamics of environmental investments in the Russian Federation over the past decade (Fig. 1) allows us to conclude that the responsible investment market is progressing and the “green economy” is becoming a vector for innovative projects.

Based on the study of investments in fixed capital related to the reasonable use of natural resources and environmental protection from the point of view of the dynamics of their volume, it should be noted that the system of financial support for environmental projects is characterized by successful development.

The volume of relevant investments in 2022 was equal to 306,887 million rubles; the main areas of investment were related to land protection and their reasonable use, protection of the air and water environments. Investments in projects in these areas amounted to 27,806, 139,273 and 110,560 million rubles.

As an example of the implementation of the concept related to green financing, it is worth mentioning the platform “Sustainable Development Sector”. This is the first domestic platform aimed at providing financial assistance to projects of an environmental nature.

CONFLICT OF INTEREST.

Authors declare that they do not have any conflict of interest.

References

- [1] Moldovan, A.A. The concept of sustainable development, “green” economy and “green” bonds: theoretical aspects / A.A. Moldovan // *E-Scio.*, 2022. – No. 5 (68). – P. 111-119.
- [2] Musostov, Z. Innovative solutions for providing preservation of natural ecosystems / Z. Musostov, V. Dzobelova // *E3S Web of Conferences: 2nd International Conference on Environmental Sustainability Management and Green Technologies (ESMGT 2023)*, Novosibirsk, 28–29 сентября 2023 года. Vol. 451. – EDP Sciences: EDP Sciences, 2023. – P. 03010. – DOI 10.1051/e3sconf/202345103010. – EDN HKZYKJ.
- [3] Dzobelova, V. B. Environmental Problems and Entrepreneurship in the Region / V. B. Dzobelova, K. P. Grabovy, D. B. Belinskaya // *BIO Web of Conferences.* – 2023. – Vol. 63. – P. 04001. – DOI 10.1051/bioconf/20236304001. – EDN AMSDNY.
- [4] Musostova, D. Development of Socio-Ecological Systems: Climate, Ecology and General Trends / D. Musostova, V. Dzobelova, D. Spitsov // *BIO Web of Conferences.* – 2023. – Vol. 63. – P. 08006. – DOI 10.1051/bioconf/20236308006. – EDN KJOZYQ.
- [5] Radushinsky, D.A.; Zamyatin, E.O.; Radushinskaya, A.I.; Sytko, I.I.; Smirnova, E.E. The Performance and Qualitative Evaluation of Scientific Work at Research Universities: A Focus on the Types of University and Research. *Sustainability* 2024, **16**, 8180. <https://doi.org/10.3390/su16188180>
- [6] Doan T.M.H., Nguyen V.L., Radoushinsky D., Gubankova M., Nguen T. N., Kubrak, I. (2019). Impact of greening projects on the development of human capital in Vietnam's cities (ITESE-2019). *E3S Web of Conferences*. Volume **135**. P. 04054. DOI: 10.1051/e3sconf/201913504054
- [7] Digitalization and Industry 4.0-Changes Caused by COVID-19 / M. S. Rysalieva, V. B. Dzobelova, A. V. Olisaeva [et al.] // *Strategies and Trends in Organizational and Project Management, Rostov-on-Don, 19–20 мая 2021 года* / Editors: Pavel V. Trifonov, Marina V. Charaeva. – Rostov-on-Don: Springer Nature, 2022. – P. 12-20. – DOI 10.1007/978-3-030-94245-8_2. – EDN ZVSEKQ.
- [8] Internal control in the economic security system of agricultural and processing organizations / G. Ya. Ostaev, B. N. Khosiev, Z. M. Azrakuliev [et al.] // *Revista de la Universidad*

del Zulia. – 2022. – Vol. 13, No. 36. – P. 140-157. – DOI 10.46925//rdluz.36.10. – EDN SJKFUM.

[9] Dzobelova, V. B. Municipal Waste Management in the Republic of North Ossetia-Alanya / V. B. Dzobelova, A. K. Berkaeva, A. V. Olisaeva // Proceedings of the 2018 IEEE International Conference "Management of Municipal Waste as an Important Factor of Sustainable Urban Development", WASTE 2018, St. Petersburg, 04–06 октября 2018 года. – St. Petersburg: Institute of Electrical and Electronics Engineers Inc., 2018. – P. 72-74. – DOI 10.1109/WASTE.2018.8554165. – EDN NILDXZ.

[10] Zhu X., Zhang G., Sun B. A comprehensive literature review of the demand forecasting methods of emergency resources from the perspective of artificial intelligence - Natural Hazards, 2019 – Springer.

[11] Gasitashvili, Z., Pkhovelishvili, M., Archvadze, N. Prediction of events means of data parallelism. Proceedings - Mathematics and Computers in Science and Engineering, MACISE 2019, 2019, pp. 32–35, 8944725. <https://ieeexplore.ieee.org/abstract/document/8944725>

[12] Alekseenko, S.A. Economy of the Krasnodar Territory in the context of the development of the "green economy" / S.A. Alekseenko, T.L. Oganessian // Modern Problems of Society. Current Issues and Innovative Ways to Solve Them: Proceedings of the I International Scientific and Practical Conference, Krasnodar, May 15, 2024. – Krasnodar: Individual Entrepreneur Alzidan Makher, 2024. – P. 28-32.

[13] Shatsky, P.S. The effect of sanctions on the economic development of Russian regions and their impact on the development of the green economy / P.S. Shatsky, A.A. Rudichenko // Green economy: a course towards sustainable development in modern conditions: Materials of the III International scientific and practical conference of faculty, young scientists, practitioners and students, Rostov-on-Don, March 28, 2024. – Rostov-on-Don: Rostov State University of Economics (RINH), 2024. – P. 390-394.

[14] Sustainable innovative development, green economy and human capital: the basic triad of the state policy of regional economic development // I.N. Makarov, E.V. Drobot, V.S. Nazarenko [et al.] // Economy, entrepreneurship and law. – 2023. – Vol. 13, No. 12. – P. 6255-6274. – DOI 10.18334/epp.13.12.120516.

[15] Omurova, S.K. Trends in strengthening social responsibility in the framework of green economy development / S.K. Omurova // News of the Issyk-Kul Forum of Accountants and Auditors of Central Asian Countries. – 2022. – No. 3-1 (38). – P. 245-250.

[16] Davydenko, L.N. Priority areas for the development of the "green economy" in the tourism industry / L.N. Davydenko // Problems of forecasting and state regulation of socio-economic development: Proceedings of the XXIII international scientific conference, Minsk, October 20-21, 2022 / editorial board: N.G. Berchenko [et al.]. Vol. 2. – Minsk: Research Institute of Economics of the Ministry of Economy of the Republic of Belarus, 2022. – P. 189-190.

[17] Rukavitsa, O.V. Modern advertising technologies and their contribution to the development of a green economy / O.V. Rukavitsa, I.Yu. Karimova // Environmental safety and sustainability of social development: Proceedings of the International Educational Conference, Moscow, March 22, 2024. – Moscow: Moscow Polytechnic, 2024. – P. 275-277.

[18] Bezrukova, T.L. Index of the economic development of the "green" economy/ T.L. Bezrukova, E.L. Zhiltsova // Economic aspects of rational nature management: traditions and innovations: Proceedings of the International scientific and practical conference, Voronezh, April 20, 2023 / Responsible. editor E. V. Titova. - Voronezh: Voronezh State Forestry Engineering University named after G.F. Morozov, 2023. – P. 26-30. – DOI 10.58168/EARNM_26-30.

[19] Musostova, D. Ensuring the economic security of the enterprise in a market economy / D. Musostova, V. Dzobelova, V. Markaryan // Reliability: Theory & Applications. – 2024. – Vol. 19, No. S6(81). – P. 1188-1193. – DOI 10.24412/1932-2321-2024-681-1188-1193. – EDN PGXUMO.