Environmental criteria when assessing the effectiveness of projects and development programs: ensuring sustainability and economic security

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Abstract. Currently, the study of environmental criteria when assessing the effectiveness of development projects and programs has deep relevance in the modern environment of sustainable development discourse. At its core, the theme is a cross-cutting issue where environmental imperatives converge with socio-economic needs, embodying the imperative to combine environmental protection with economic prosperity. Understanding the environmental criteria embedded in project evaluation is critical because of the inherent interdependencies between human activities and ecological systems. Moreover, the study of environmental criteria contributes to a more detailed understanding of the dynamics of sustainability, outlining pathways towards sustainable and regenerative development trajectories. Sustainable development depends on reconciling environmental integrity with socio-economic progress, which requires the adoption of holistic approaches that go beyond simple mitigation of environmental impacts. By clarifying environmental thresholds and tipping points associated with development projects and programs, integrating environmental criteria facilitates the identification of sustainability bottlenecks and the formulation of adaptive management strategies.

1 Introduction

The current landscape of efforts to develop effective programs aimed at ensuring the sustainability and economic security of both business entities and the country as a whole is inexorably intertwined with environmental imperatives, which requires a rigorous assessment system based on reliable environmental criteria. We believe that the effectiveness of development projects and programs inherently depends on their harmonization with environmental parameters, ensuring the preservation of sustainable development paradigms and strengthening economic security buffers.

Essentially, environmental criteria cover a multifaceted range of environmental considerations, including but not limited to biodiversity conservation, ecosystem

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sustainability, and resource conservation. These criteria serve as indispensable indicators for determining the environmental footprint of projects and programs, facilitating informed decision-making processes that promote environmental integrity.

Ecosystem resilience is becoming an important criterion that requires careful study and determines the ability of ecological systems to withstand and recover from disturbances. Assessing the sustainability quotient of projects and programs entails assessing ecosystem stability, adaptive capacity, and mechanisms for responding to disturbances, culminating in sustainability-oriented measures aimed at increasing environmental sustainability.

Conservation of resources becomes a sine qua non within environmental criteria, embodying the wise management of natural resources to avoid depletion and create sustainable use patterns. The assessment framework should include a comprehensive analysis of resource extraction rates, habitat fragmentation dynamics, and carbon sequestration potential, catalyzing resource-efficient development trajectories that promote long-term ecological viability.

The synthesis of environmental criteria and economic imperatives represents a symbiotic relationship in which sustainable development paths are shaped by a combination of preserving environmental integrity and enhancing economic prosperity. By supporting a holistic assessment system based on environmental criteria, development projects and programs can overcome the dichotomy between environmental conservation and economic progress, ushering in a new era of sustainable development characterized by the merging of environmental sustainability and economic security.

In this context, it is critical to define the application of environmental criteria within the broader framework of project evaluation methodologies. A nuanced approach to environmental assessment requires the adoption of interdisciplinary methodologies that integrate environmental science, socioeconomic analysis, and technological innovation.

2 Materials and methods

Ecological analysis plays a great role in the study. In this regard, the effectiveness of development projects and programs from an environmental point of view is assessed. Research into agricultural production methods taking into account environmental aspects and finding innovative solutions to reduce negative impacts on ecosystems [2].

The feasibility study of projects is the most important method for studying the topic "Environmental criteria in assessing the effectiveness of projects and development programs." In this regard, the development of business plans and feasibility studies of investment projects in agriculture will make it possible to analyze costs and benefits, predict income, conduct risk assessments and calculate return on investment [5].

A final note is the use of geographic information systems (GIS) to analyze land use, assess land resource potential, identify optimal locations for investment, and predict changes in the agricultural landscape. We believe that this method will allow the most effective assessment of environmental criteria when assessing the effectiveness of projects and development programs.

Therefore, these methods can be used individually or in combination to provide a complete and comprehensive exploration of a topic. Several of the methods discussed are used in this article.

3 Results

In the course of commercial activities, we constantly compare costs and the effects obtained. The effect can be different results. If you effectively organize a particular business process,

you can save time, increase productivity, improve the quality of service, etc., which will most likely affect the final results in the form of additional profit.

The central place in the practical application of environmental criteria is occupied by quantitative indicators that can reflect the multifaceted aspects of environmental impact. Environmental indicators, ranging from various indices to ecosystem service indicators, provide tools for quantifying the environmental footprint of development projects and programs.

It must also be said that the integration of environmental risk assessment systems increases the predictive ability of environmental assessments by quantifying the likelihood and magnitude of adverse environmental impacts. Environmental risk assessment methodologies based on probabilistic modeling techniques and scenario analysis can identify potential environmental hazards, characterize exposure-response relationships, and estimate environmental risk probabilities, facilitating a proactive approach to risk management and mitigation. By incorporating uncertainty analysis and sensitivity assessments, environmental risk assessment systems improve the robustness and reliability of environmental assessments, thereby making development projects and programs more resilient to unexpected environmental contingencies.

It is worth paying attention to some indicators from statistical sources in the field of environmental criteria when assessing the effectiveness of projects and development programs from the perspective of ensuring sustainability and economic security. Based on the general statistics provided (Figure 1), it can be noted that, relative to other areas, the leading place is occupied by “reducing environmental pollution.”

Figure 1 shows statistics on the use of environmental projects and their effectiveness. Based on the diagram, we can note that the priority direction is also the reduction of - environmental pollution, the least popular areas are the reduction of CO2 emissions into the atmosphere and the replacement of raw materials with safe ones [2].

Figure 2 shows statistics on the use of environmental projects in the field of energy supply. In this industry, the priority direction is to reduce environmental pollution, the least popular is recycling. The remaining directions vary approximately at the same level. Indicators in all areas, with the exception of the most popular, are less than 50%.

As for the construction sector, rather weak indicators can be noted here, with the exception of the 2023 indicators in the direction of “reducing CO_2 emissions into the atmosphere ” and indicators in the direction of “reducing environmental pollution ”, which vary around the 50% mark. Which indicates that the industry’s innovative potential is not operating at full capacity.

The highest priority area in the construction industry is the reduction of environmental pollution. The remaining directions vary at approximately the same level.

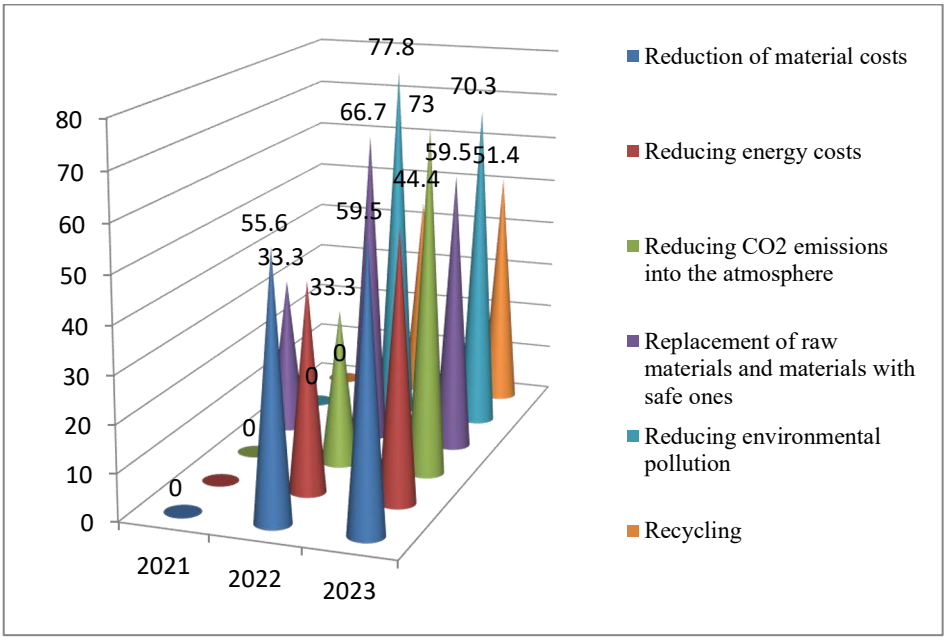

Fig. 2. Environmental projects and solutions and their effectiveness

As a positive trend, it can be noted that over the years, the percentage of innovative environmental support is growing in almost all directions.

4 Discussion

Consequently, based on the results of the study, we concluded that the use of environmental criteria as part of the evaluation of investment and other projects and development programs represents a critical task aimed at promoting sustainability and strengthening economic security. In the context of contemporary discourse on sustainable development, the need to reconcile development initiatives with environmental conservation has become increasingly urgent. This imperative underscores the recognition that economic growth must be carried out within an environmental framework to ensure the longevity of socio-economic systems.

The conceptual framework of environmental criteria explains a multifaceted approach to project and program evaluation that integrates considerations of environmental integrity with traditional measures of efficiency and effectiveness. Central to this paradigm shift is the recognition of the interdependence between human activities and the natural environment, with any disruption of the ecological balance creating cascading consequences across all socio-economic spheres.

In this sense, the adoption of environmental criteria goes beyond mere regulatory compliance and becomes a strategic imperative for stakeholders in various sectors. By systematically integrating parameters such as carbon footprint, resource efficiency, and biodiversity conservation into assessment systems, decision makers seek to mitigate adverse environmental impacts while increasing project sustainability [1].

Moreover, the inclusion of environmental criteria generates a paradigmatic shift towards a holistic understanding of project performance that abandons reductionist views in favor of systems analysis. This holistic approach entails recognizing that the pursuit of economic prosperity must be based on preserving environmental capital, thereby ensuring the long-term viability of socio-economic efforts.

It is important to note that the application of environmental criteria requires a detailed understanding of the complex interaction between environmental dynamics and economic imperatives. By applying methodologies such as life cycle assessment and environmental impact analysis, stakeholders can clarify the full range of environmental externalities associated with development efforts, thereby facilitating informed decision-making processes.

Summing up the research, it is worth confirming the words of R.A. Puryaev that the integration of environmental criteria in the assessment of projects and development programs is important for solving the complex problems of the 21st century [8]. By applying robust impact assessments, capturing ecosystem services and using appropriate indicators, we can ensure that development initiatives contribute to a sustainable future in which economic security and environmental well-being are inextricably intertwined.

The growing global focus on sustainability and environmental awareness has significantly impacted the investment landscape. In this context, environmental criteria become the most important factor determining the investment attractiveness of Russian enterprises. This phenomenon is driven by a combination of factors, including growing demand for environmentally responsible products and services, increasing environmental regulations, and growing recognition of the financial and reputational benefits associated with sustainable practices.

Environmental criteria cover a range of activities, from the development of new technologies that reduce environmental impact to the implementation of sustainable business models that prioritize resource efficiency and circular economy principles. Russian enterprises that adopt these innovations will be able to gain a competitive advantage by attracting investors seeking to align their portfolios with sustainable development goals.

One of the key drivers of this trend is the rise of environmental, social and governance (ESG) investing. Investors are increasingly scrutinizing companies' environmental performance, recognizing the inherent risks associated with unsustainable practices. Russian businesses that demonstrate a commitment to environmental innovation through tangible actions such as reducing greenhouse gas emissions, minimizing waste generation and implementing sustainable sourcing practices are more likely to attract ESG-focused investors.

In addition, environmental criteria can improve the operational efficiency and profitability of Russian enterprises. By implementing cleaner production processes and using renewable energy sources, companies can reduce energy consumption and reduce dependence on limited resources. This results in lower operating costs and higher profit margins, which is an attractive attribute for potential investors.

Moreover, environmental criteria can help differentiate a brand and enhance its reputation. In today's socially conscious marketplace, consumers are increasingly choosing products and services from companies with strong environmental credentials. Russian enterprises actively participating in environmental innovation can use this trend to create a positive brand image and increase customer loyalty, thereby increasing their market value and investment attractiveness.

However, it is critical to recognize the challenges associated with environmental innovation in the Russian context. Access to research and development funding, the availability of necessary infrastructure and the need for supportive government policies are all critical factors that can hinder the adoption of sustainable practices [1].

5 Conclusion

Thus, this study examined the main factors in the use of environmental innovations in the possibilities of increasing the investment attractiveness of Russian enterprises. We came to

the conclusion that environmental criteria provide Russian enterprises with a significant opportunity to increase their investment attractiveness. Thus, by adopting sustainable practices, companies can adapt to the evolving investor landscape, improve operational efficiency and strengthen their reputation in the domestic market.

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