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ASSESSMENT OF THE IMPACT OF ENVIRONMENTAL RISKS IN BUSINESS ACTIVITIES AND WAYS TO REDUCE THEM

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Abstract: This article provides a comprehensive analysis of the economic, operational, institutional and strategic impact of environmental risks on business activities. The main goal of the study is to identify the channels of influence of environmental risks on the activities of the enterprise, systematize scientific and methodological approaches to their assessment and develop practical mechanisms for their reduction. The results of the analysis show that environmental risks are not limited to causing damage to the environment, but also directly affect the costs, liquidity, financing opportunities, market reputation, export potential and long-term competitiveness of the enterprise.

Key words: environmental risk, entrepreneurship, environmental management, ISO 14001, ESG, EMS, climate risk, operational risk, reputational risk, green transformation, risk assessment.

INTRODUCTION

In the modern economy, business activity is increasingly defined not only by market, financial or technological uncertainties, but also by environmental risks. Factors such as climate change, resource scarcity, waste management requirements, increasing water and air quality standards, carbon regulations and green supply chains are becoming an integral part of the business environment. According to the Organisation for Economic Co-operation and Development (OECD),[1], small and medium-sized businesses form a significant part of the business sector's ecological footprint, while they are slower to move towards ecological modernization than large enterprises. This reinforces the need to study environmental risks as a separate scientific object within the framework of entrepreneurial economics.

Environmental risk can be viewed from the perspective of business activity in two dimensions. The first is the risk associated with environmental damage resulting from the activities of the enterprise. The second is the risk associated with the impact of environmental changes and regulations on the enterprise itself. In this sense, environmental risk is not only a category of "damage to nature", but also an economic category that determines the sustainability of the business, changes in the cost structure, investment attractiveness and market access. World Bank[2]and in the materials of the UN Environment Programme Finance Initiative[3]It is also noted that environmental and climate risks are increasingly integrated with financing, credit quality, information openness and corporate sustainability.

Today, it is urgent to theoretically and methodologically reveal the impact of environmental risks on business activities, systematize mechanisms for their assessment, and develop practical ways to reduce their negative impact. From this point of view, it is necessary to identify the types and channels of environmental risks, generalize assessment approaches, develop mitigation instruments for business entities, and develop an integrated management model.

REVIEW OF RELATED LITERATURE

An analysis of the scientific literature on the topic shows that while the issue of environmental risks was initially studied more in the context of environmental policy, natural resource use and environmental protection, it has subsequently evolved into a multidisciplinary area related to risk management, corporate governance,

1 OECD. OECD SME and Entrepreneurship Outlook 2023. - Paris: OECD Publishing, 2023.
2 World Bank. Climate Change and Environmental Risks in the Financial and Private Sectors / Open Knowledge Repository.
3 UNEP Finance Initiative. Sustainability Disclosure Landscape Report for Risk Management. - Geneva: UNEP FI, 2025.

"environmental, social and governance (ESG)" and business sustainability. ISO 14001 among international standards[4]The ISO 14001 standard is recognized as the most widely used institutional framework for establishing, implementing and continuously improving an environmental management system. This standard enables organizations to systematically manage their environmental aspects, comply with legal requirements and improve environmental performance.

International Finance Corporation (IFC) "Performance Standard 1" and "ESMS toolkit" documents[5]It justifies the need to identify, mitigate, monitor and integrate environmental and social risks into business processes. This approach is especially relevant for businesses that receive investments, export or work with financial institutions, as environmental risk is no longer a separate technical issue, but also a condition for accessing financing.

Recent scientific research has explored the relationship between environmental risks and business performance in various ways.[6]. For example, some studies show the impact of climate change on the innovative activity of small and medium-sized businesses. They note that enterprises exposed to climate risks may respond more innovatively under certain conditions. Other studies show the differential impact of environmental regulation on firm growth, with technological innovation and government support playing a mediating role. These results indicate the need to view environmental risk not only as a constraint, but also as a transformative pressure and an innovation driver.

At the same time, scientific literature notes that the level of environmental risk management depends on the resources, quality of management, and strategic maturity of the enterprise. In 2024, research[7]The positive impact of strategic risk management on the sustainability of small and medium-sized businesses, including the environmental pillar, has been demonstrated. Integrated sustainability risk prioritization methods show that environmental risks can be prioritized along with other organizational risks. Based on the literature review, it can be said that although there is a general scientific and institutional framework for environmental risks, the specific conditions of business activity, especially for small and medium-sized businesses, do not sufficiently capture the economic impact, assessment and mitigation mechanisms of environmental risk in a single conceptual model.

RESEARCH METHODOLOGY

This study is of a qualitative theoretical-analytical nature, using the methods of systematic analysis, comparative approach, content analysis, and conceptual modeling.

In the first phase, the Organization for Economic Cooperation and Development (OECD)[8], World Bank[9], IMC[10], UN Environment Programme financial initiatives[11]and the International Organization for Standardization (ISO)[12]Documents of international institutions such as and modern scientific articles on environmental risk and small and medium-sized businesses were analyzed. This approach made it possible to generalize the economic content, types, and management instruments of environmental risks.

In the second stage, a methodology was used to group environmental risks by channels affecting business activities. In this case, risks were divided into five blocks: "operational risks", "financial risks", "regulatory and legal risks", "reputational risks" and "strategic risks". This classification was formed in accordance with the IFC and ISO 14001 approaches, as well as research on prioritizing risks for sustainability.

The third stage includes a probability-consequence matrix for assessing environmental risks, scenario analysis, identification of significant environmental aspects, and an environmental management system.(EMS) Based on the indicators, an author's approach was developed based on a chain of factors: environmental source, risk event, business impact, measurement by indicator, and management action. This construction serves not only to describe risk management, but also to link it to management decisions.

4 International Organization for Standardization. ISO 14001:2015 Environmental management systems - Requirements with guidance for use. - Geneva: ISO.
5 International Finance Corporation. IFC Performance Standards on Environmental and Social Sustainability. - Washington, DC: IFC., International Finance Corporation. Environmental and Social Management System Toolkit: General. - Washington, DC: IFC, 2025.
6 Alam A., Uddin M., Yazdifar H. et al. SMEs respond to climate change: Evidence from entrepreneurial firms // Technological Forecasting and Social Change. - 2022.
7 Jiménez A. et al. Management of Strategic Risks for the Sustainability of SMEs // Sustainability. - 2024., Yazo-Cabuya EJ et al. Integration of Sustainability in Risk Management and Prioritization of Organizational Risks // Sustainability. - 2024.
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10 International Finance Corporation. IFC Performance Standards on Environmental and Social Sustainability. - Washington, DC: IFC., International Finance Corporation. Sustainable MSME Finance Reference Guide. - Washington, DC: IFC, 2023., International Finance Corporation. Environmental and Social Management System Toolkit: General. - Washington, DC: IFC, 2025.
11 UNEP Finance Initiative. Sustainability Disclosure Landscape Report for Risk Management. - Geneva: UNEP FI, 2025.
12 International Organization for Standardization. ISO 14001:2015 Environmental management systems - Requirements with guidance for use. - Geneva: ISO.

At the fourth stage, based on the results of the analysis, an integrated mechanism for reducing environmental risks was developed. It interconnected measures at the enterprise level, including financing, information openness, stakeholder communication, and technological modernization. The advantage of this methodological approach is that it views environmental risk not as a separate environmental issue, but as part of a system of strategic and economic risks of entrepreneurship.

ANALYSIS AND RESULTS

Environmental risks in business activities have a multi-channel impact mechanism. They are manifested primarily through increased business costs. Examples include inefficient use of energy and water resources, waste disposal costs, environmental fines, increased insurance costs, and additional investments to adapt to new regulatory requirements. ISO 14001 standard[13]and in IMC documents[14]It is emphasized that the systematization of environmental management serves to reduce such hidden and direct costs, reduce compliance risk, and increase resource efficiency.

The second important channel of influence of environmental risks is related to financing. Materials from the World Bank and IFC[15]shows that businesses that do not adequately address environmental and climate risks face additional restrictions in obtaining credit, investment and insurance. ESG disclosure, environmental and social due diligence and risk reporting practices are becoming increasingly important, especially for banks and investors. As a result, failure to manage environmental risks is reflected not only in environmental losses, but also in increased capital costs or reduced access to finance.

The third channel of influence is related to the market and competition. OECD[16]notes that, despite being an important subject of green transformation, small and medium-sized businesses lag behind large enterprises in improving environmental performance. At the same time, the degree of adaptation to market demand, export standards and green requirements in supply chains directly affects the market share and cooperation opportunities of the enterprise. Therefore, the lack of management of environmental risks is also manifested in the form of market exclusion, exit from the chain of large buyers or reduced opportunities in tenders.

The fourth influence channel is related to operational stability.[17]. Climate and environmental risks can manifest themselves in the form of disruptions in the supply of raw materials, water shortages, heat waves, natural disasters, production shutdowns and logistical failures. Environmental and climate risks are particularly hard on small businesses, as they have fewer reserve resources, lower adaptive capacity and limited diversification. The World Bank and modern scientific research also show that micro and small enterprises are highly vulnerable to environmental and climate risks.

The fifth channel of influence is related to strategic transformation. Some studies show that climate pressures and environmental demands encourage enterprises to innovate, technologically upgrade, and seek new business models. In particular, climate change has been shown to be positively correlated with the innovation performance of small and medium-sized businesses under certain conditions. This situation reveals the dual nature of environmental risk. On the one hand, it is a source of costs and constraints, and on the other hand, it is also a factor that stimulates modernization and innovative renewal.

Based on the above analysis and research, environmental risks can be grouped as follows (Table 1).

Table 1. Ecological risk classification[18]

Groups	Risk type	Risk factors
First group	Risks of resource use	Energy, water and raw material efficiency issues
Second group	Pollution and waste risks	Situations related to waste, emissions, wastewater, soil and air pollution
Third group	Regulatory risks	cases related to licenses, permits, environmental standards and fines
Fourth group	Physical climate risks	situations related to heat, floods, droughts, storms and other natural factors
Fifth group	Transition risks	transition to a low-carbon economy, carbon policy, new technologies and changing customer demands

13 International Organization for Standardization. ISO 14001:2015 Environmental management systems - Requirements with guidance for use. - Geneva: ISO.

14 International Finance Corporation. IFC Performance Standards on Environmental and Social Sustainability. - Washington, DC: IFC., International Finance Corporation. Sustainable MSME Finance Reference Guide. - Washington, DC: IFC, 2023.

15 World Bank. Climate Change and Environmental Risks in the Financial and Private Sectors / Open Knowledge Repository., International Finance Corporation. Environmental and Social Management System Toolkit: General. - Washington, DC: IFC, 2025.

16 OECD. OECD SME and Entrepreneurship Outlook 2023. - Paris: OECD Publishing, 2023.

17 Becker AK et al. Vulnerable entrepreneurs' preferences for climate risk management strategies // Journal of Environmental Management. - 2025.

18 Developed by the author.

Such a classification is the work of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD).[19]It also fits in with the logic of physical and transition risks in the approach. From the point of view of the assessment mechanism, it is not enough to simply describe environmental risks in general in order to effectively manage them. At least three criteria should be assessed for each risk. These are probability, magnitude of consequences and degree of controllability. ISO 14001 standard[20]identifying and prioritizing significant environmental aspects, and the IFC's environmental and social managementsystem (ESMS)After identifying risks and impacts, it is necessary to translate them into management programs. Based on this, we recommend using the following assessment algorithm.

Step 1.identifying the environmental aspect;
Step 2.write down the corresponding risk event;
Step 3.assessing the economic, legal and reputational impact on the business;
Step 4.selecting a monitoring indicator;
Step 5.determine a reduction measure.

For example, for a business entity that uses a large amount of water, an "interruption in water supply" or "increased water standards" is taken as an environmental risk event. Its economic impact is assessed in terms of a reduction in production volume, an increase in costs, or an increase in the cost of production. Water consumption per unit of output, the percentage of water reused, or the ratio of water costs to revenue can be taken as a monitoring indicator. Corresponding management measures include water-saving technology, a reuse system, a technical audit, and an emergency outage plan. This approach elevates environmental risk from an abstract concept to a manageable economic category.

According to the results of the analysis, the most effective ways to reduce environmental risks are as follows. The first is to implement an environmental management system. The ISO 14001 standard is the main instrument in this regard, which creates a cycle of environmental policy, objectives, responsibility, monitoring and continuous improvement. The second is the ESMS approach, which links risk identification, prevention, monitoring and communication with stakeholders to business practices. The third way is resource efficiency and the transition to clean technologies, in which reducing waste and resource consumption simultaneously provides environmental and financial results. The fourth way is information openness and reporting transparency, that is, measuring environmental indicators and communicating them to stakeholders. The fifth is the use of green finance and support instruments.

It is worth noting that the strategy for reducing environmental risks for small businesses should not be a complete copy of the model of large enterprises. OECD and IFC materials indicate the need for a simplified, but systematic approach adapted for small and medium-sized businesses. For small businesses, a "compact EMS", a resource audit, priority 3-5 environmental indicators, simple scenario analysis and phased modernization will be more practical. Therefore, the principle of "one size fits all" in environmental risk management is not effective. Instruments should be appropriate for the size, industry and resource capabilities of the enterprise. From this point of view, the following integrated model of environmental risk management for business entities has been developed (Figure 1).

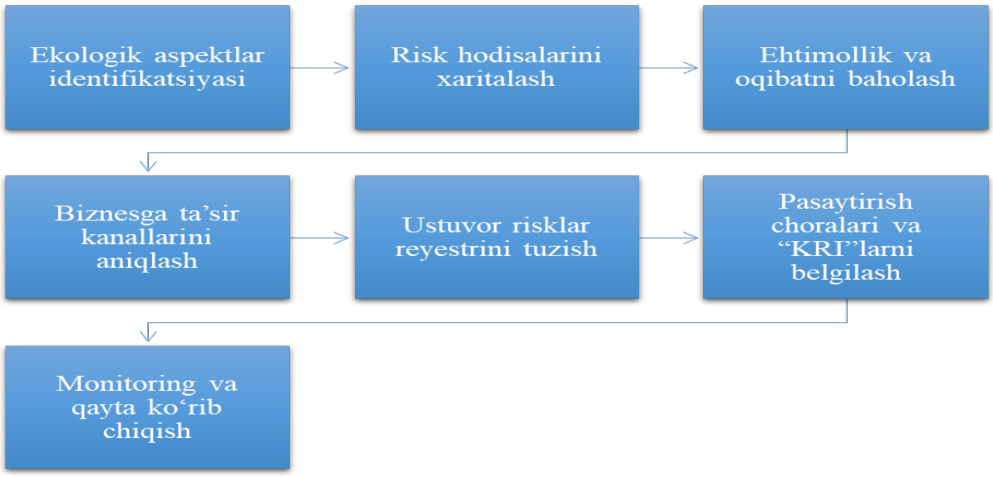

Figure 1. Environmental risk management integrated model[21]

19 Task Force on Climate-Related Financial Disclosures. Recommendations and guidance on climate-related risks and disclosures.
20 Jesus. ISO 14001:2026 - Environmental Management Systems (overview booklet). - Geneva: ISO, 2026.
21 Author's development

This model does not limit environmental risk to environmental protection, but directly links it to economic efficiency and strategic sustainability.

CONCLUSION AND SUGGESTIONS.

Based on the analysis, it can be concluded that environmental risks in business activities are not a secondary or peripheral factor, but a strategic factor that determines the competitiveness and sustainable development of the enterprise. Their impact is manifested through resource costs, operational disruptions, regulatory and legal pressure, financing conditions, market demands and reputational consequences. Small and medium-sized enterprises are especially sensitive to environmental risks, which is explained by their adaptive capacity and institutional readiness.

Environmental risk management should be considered not as a separate environmental departmental task in business activities, but as a component of overall risk management, strategic planning and investment decisions. ISO 14001 standard[22], "Performance Standard 1" of IMC[23]and ESMS approaches provide the institutional framework for this integration. Therefore, the success of environmental risk reduction depends more on how deeply it is embedded in the management system than on the technical controls themselves.

The approach developed in the study suggests that the most appropriate way to assess environmental risks is to interpret them not as an "environmental event", but as a "risk event affecting business". That is, changes in water scarcity, waste, emissions or regulatory requirements should be assessed not in themselves, but through their impact on costs, profits, continuity, exports and financing. This approach makes environmental risk an object of practical management.

As a practical suggestion, first of all, an environmental risk register should be introduced in business entities. It should indicate the source, event, possible consequences, assessment indicator, responsible person and management measure for each risk. This will transform environmental risks in enterprises from a "problem that is out of our sight" to a "process managed with responsibility and indicators".

Secondly, it is necessary to develop a simplified environmental management system for small and medium-sized enterprises. In this case, rather than a complex system at the level of full certification, a practical model consisting of an environmental policy, 3-5 priority indicators, periodic audits and a short action plan will be more effective. This will be adapted to the resource constraints of small and medium-sized businesses, while maintaining the logic of ISO 14001.

Third, resource efficiency programs should be widely implemented in enterprises. Improving efficiency in water, energy, raw materials and waste not only reduces environmental risks, but also reduces costs. In this regard, environmental modernization should be seen not as an expense, but as an investment that brings long-term economic benefits. ISO materials and international practice also support this approach.

Fourth, it is necessary to create a culture of environmental information openness and reporting for business entities. This is not only useful when working with investors, banks and insurance organizations, but also important for the quality of internal management. Since it is difficult to manage immeasurable risk, enterprises should establish a minimum monitoring system for water, energy, waste, emissions and environmental incidents.

Fifth, it is appropriate to support green finance, environmental auditing, technological innovation and advisory services for small and medium-sized businesses at the state and institutional policy levels. Because small businesses are more exposed to environmental risks, but have fewer resources to manage them independently. Therefore, reducing environmental risks is not only an internal task of the enterprise, but also a cooperative task involving the state, the financial system and development institutions.

The final conclusion is that reducing environmental risks is not an additional burden on business activities, but an essential condition for sustainability, competitiveness and long-term value creation. By early identification, measurement and systematic management of environmental risks, businesses not only reduce losses, but also expand opportunities for new markets, green finance, exports and innovative transformation.

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