

# Analysis and assessment of environmental responsibility management for SMEs in the context of sustainable development

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**Abstract.** The research is devoted to the analysis and assessment of environmental responsibility management for SMEs in the context of sustainable development. The main environmental problems that arose with the beginning of the development of industrialization are identified and their impact on the life of Ukrainian society is characterized. That is why a theoretical and practical analysis of the above-mentioned problems is necessary, which will comprehensively reflect the state of environmentalization of SMEs in Ukraine. The main problems of pollution of the territory of Ukraine as a result of Russian aggression. Thus, according to the rating of The Environmental Performance Index, which is updated on average every 2 years, Ukraine currently ranks 52 second in terms of environmental friendliness. For a comprehensive approach in the field of changing the attitude to the environmentalization of SMEs, first of all, it is necessary to implement a number of measures, as well as to strengthen the motivation system for enterprises that fulfill all obligations to the state in the field of ecology. Under the condition of transformation towards the greening of SMEs, Ukraine may be able to present itself on the international arena as an ecological and agrarian country.

## 1 Introduction

Sustainable development systematically combines economic, social, and environmental goals to meet the needs of present generations without compromising the ability of future generations to meet their own needs — thereby ensuring a better quality of life for current and future generations [1]. The transition to sustainable development involves significant changes in the influence of market actors on the ecological situation and the environment [1]. In this connection, the question of environmental responsibility of business [2] arises, which has become a necessary component of the corporate responsibility of SMEs. Environmental responsibility of SMEs includes efforts to reduce the negative impact on the environment [2] and covers both legislative requirements and free initiatives aimed at improving the reputation and competitiveness of enterprises in

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the eyes of social and economic players [1]. Thus, there is a need for research that analyzes not only the ecological, but also the social and economic impact of environmental initiatives of SMEs at the level of local communities and society as a whole, because it is precisely the aspects of sustainable development that depend more on the activities of SMEs, as well as what opportunities for growth and improvements exist.

There is an urgent need for action on sustainable development, which requires concrete and effective measures at all levels - from individual actions of every citizen to strategic decisions at the level of government and international organizations. In this context, the role of SMEs becomes extremely important, as they can become catalysts for change, promoting innovation, the implementation of environmental technologies and changing attitudes towards the use of resources.

Limited resources and irreversibility of damage make it difficult to restore natural resources and ecosystems, every day of inaction leads to further aggravation of the situation. Therefore, it is necessary to act urgently and effectively to reduce the negative impact of our planet and ensure its viability for future generations.

It is important that SMEs show environmental awareness, because their actions, even if on a small scale, can have a noticeable impact on the environment, both at the local and national level [3]. Increasing attention to this issue on the part of consumers, intensifying appeals from interested parties and pressure from the government will contribute to increasing the level of environmental responsibility of enterprises, especially small and medium ones [4]. It is important to understand that environmental responsibility is a key aspect in understanding the relationships between business environment conditions and green innovation [5]. Thus, SMEs will receive an additional status of legitimacy when their environmental practices, work methods, strategies and results meet the goals of all stakeholders [6]. Research in these areas will allow a better understanding of the role of SMEs in achieving the goals of sustainable development and identify specific strategies and measures to support their positive contribution to environmental responsibility management in the context of sustainable development.

## **1.1 Literary review**

Active research on issues of sustainable development and the need to implement environmental responsibility management programs began at the end of the last century when the aggravation of the problems of the ecological state of the environment became critical. Important contributions to this field in recent decades are the research of scientists of the Club of Rome, which united participants from the world's political, financial, cultural, and scientific spheres. Their reports draw attention to the global problems of our time and call for a change in economic behavior. In the work of E. Pestel "Beyond growth" [7], a pessimistic forecast regarding the development of the world economy is expressed and the conclusion that the traditional economic model will inevitably run into the depletion of resources in the coming decades. The author emphasizes that the further progress of society largely depends on the development of the "spirit of responsibility" [7] for the preservation of natural, spiritual, and moral values, which are the basis of social and cultural development.

The works of other members of the Club of Rome, such as G. Daly, J. Randers, Dennis, and Donella Meadows, continue the discussion about the need to introduce a culture of environmental responsibility as a tool for sustainable development [7, 8]. In the latest thesis of the Club of Rome with the title "Come On! Capitalism, Short-termism, Population and the Destruction of the Planet" [9], prepared under the leadership of the current presidents of the club - Ernst Weitzäcker and Anders Wiikman, emphasizes that in order to preserve life on the planet, humanity must immediately increase the level of its environmental responsibility and to change the nature of economic processes [9]. The introductory part of the report states: "The world is in danger, and its salvation is possible only through a change in worldview" [9]. The thesis offers specific solutions to improve the environmental situation, in particular: the introduction of sustainable agriculture, energy decentralization, the development of regenerative urbanization, the transition to a circular economy, and other measures [9]. The main idea of the report is a call to establish new global rules of economic behavior, which are based on the principle of environmental responsibility and should become binding for the whole world.

In domestic scientific literature, the problem of environmental responsibility of business in the context of achieving sustainable development is actively discussed in works [3, 4, 10-17] and other studies. In their works, it is noted that the growing relationship between the processes of economic growth and ecological deterioration emphasizes the relevance of the scientific search for "motivated ways of transition of the modern, inherently anti-ecological market economy, i.e. the entire economic system (both at the national and global level), to a "green", ecologically safe economy" [18]. Ukrainian scientists consider sustainable development as a new paradigm of economic development, which is aimed at ensuring the integrity of natural systems, which determines the global stability of the entire biosphere [7].

Also, in modern conditions, issues of environmental responsibility of business are gaining special importance due to threats of man-made and environmental disasters. This includes the development and implementation by SMEs of voluntary environmental protection programs. Many scientists study the issue of environmental responsibility of business, including scientists from Ukraine [2, 19-24] and others. Despite the large volume of scientific works in this direction, we believe that the issue of environmental responsibility of SMEs needs further analysis.

In recent years, the aggravation of environmental problems has reached such a critical level that not only research scientists, but also spiritual leaders of various spheres of society emphasize the need to revise the norms of economic behavior. For example, Pope Francis in his environmental encyclical "Laudato Si" [25] calls for reflection on the fact that humanity's irresponsibility has led to an extreme environmental crisis and emphasizes the need to "understand not only the symptoms, but also the deep causes" of this problem [25]. The Pontiff believes that the main causes of the environmental crisis are scientific and technological progress and the global spread of the technocratic paradigm, which does not recognize any boundaries or ethical responsibility. He notes that this paradigm has created an industrial system that is unable to integrate and recycle waste and by-products at the end of production and consumer cycles [25].

According to the Encyclical, neglecting natural resources is sinful, since both man and nature are God's creatures [25].

According to the Pontiff, if continue to use the current models of production and consumption, the negative consequences of the traditional economic model will deepen [25]. Therefore, the Encyclical calls for a change in economic behavior and management methods, emphasizing the need for producers to consider the environmental consequences of their activities [25]. At the same time, the development of a culture of ecological consumption and responsible use of resources, the basic principle of which should be a constant caring attitude towards nature and care for "our common home" - the Earth, should become a duty for all humanity and "part of a lifestyle that includes the ability to live together in unity" [25].

In all the mentioned works, it is highlighted that the leader in the introduction of environmental awareness and economic behavior should be business as the most active social stratum, which should build its activities, considering the principles of environmental responsibility [2]. However, one of the unresolved issues remains the development of practical mechanisms and directions for the implementation of environmental responsibility management programs of small and medium-sized businesses (SMEs), which will largely determine the success of the sustainable development strategy.

Thus, the main goal of the study is a thorough analysis and evaluation of the environmental responsibility management of SMEs in the context of sustainable development.

## **2 Research methods**

The research used a combination of quantitative and qualitative methods to collect relevant data on environmental issues and their consequences. Official statistics, government reports, academic research and expert interviews were used to compile comprehensive datasets. Survey results were used to collect public opinion on the perception of environmental problems and the need for changes in environmental policy.

A thorough review of the literature and official reports was conducted in order to determine the main environmental problems that arose with the beginning of the development of industrialization and characterized their impact on the life of Ukrainian society. The process of depopulation in Ukraine in recent years is analyzed and graphically displayed, and its consequences are determined. The main problems of pollution of the territory of Ukraine as a result of Russian aggression and life processes of various enterprises are considered. The need for changes in the field of ecology, considering the requirements of the European Union and a gradual change in the attitude of the state authorities to problems that affect the health and life of society, has been proven. In the process of studying the issue of greening and problems in this area, recommendations were developed to speed up the implementation of a new environmental policy in the field of entrepreneurship.

### 3 Results and discussion

In recent years, the issue of environmental responsibility of business is becoming more and more relevant, especially in the context of the threats of man-made and environmental disasters [26]. In this context, the voluntary development and implementation of environmental protection programs by enterprises is important [27]. These questions become especially important in reflecting the concept of sustainable development, which covers economic, social, and environmental aspects [28].

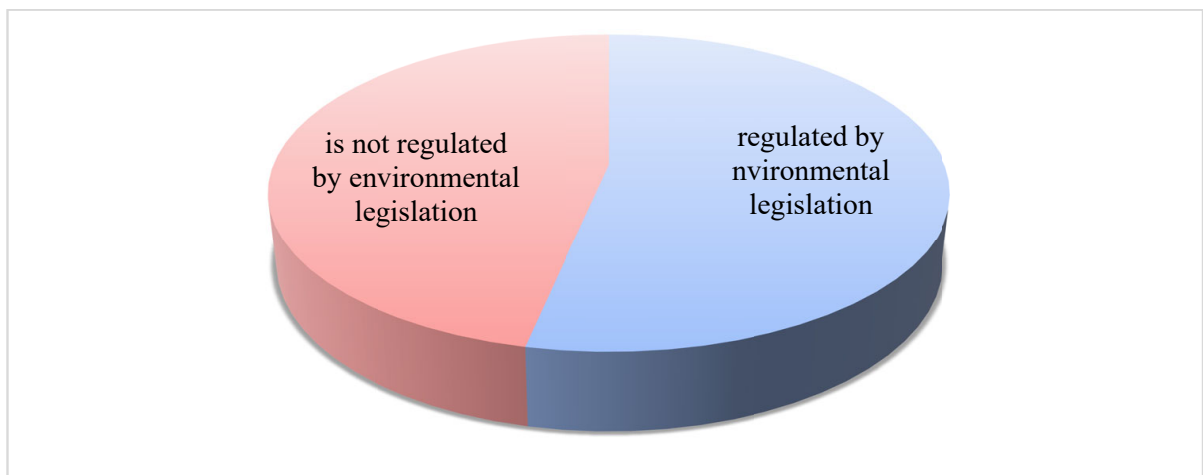
Modern ecology occupies a central place in various spheres of human life, including spiritual, humanitarian, economic, technical, scientific and political. Modern realities have emphasized the acuteness and complexity of environmental problems, which, despite the fact that they are not yet fully understood by the majority of humanity, require immediate solutions to preserve life on the planet not only for the current generation, but also for future ones [33].

In recent decades, important international documents devoted to the problems of the environment and harmonious development of society pay great attention to the formation of environmental responsibility, consciousness, thinking and culture [27-29]. Ukraine, guided by the main principles of international environmental policy, defines a balanced environmental policy [27].

In 1991, the Law of Ukraine "On Environmental Protection" was adopted [27]. In this law, it is determined that ecological safety is the state of the natural environment, which ensures the prevention of deterioration of the ecological situation and threats to human health [27]. Enterprises, institutions and organizations that have a harmful impact on the environment must be equipped with means for cleaning emissions and discharges, reducing the impact of harmful factors and pollution control systems [27].

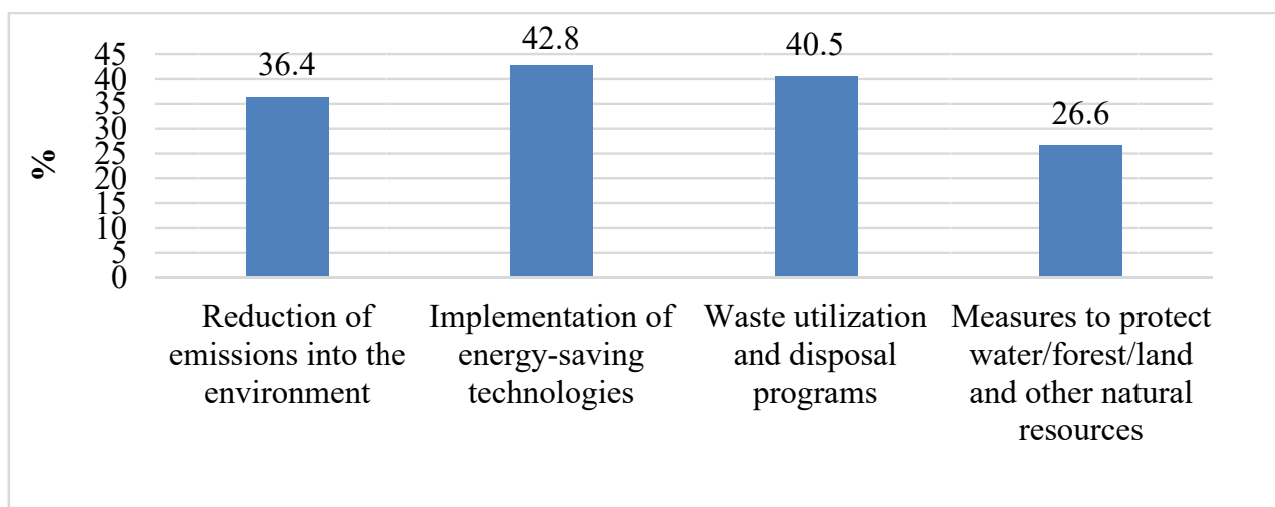
Unfortunately, the responsible attitude towards the environment has not yet become a widely implemented practice in the social policy system of enterprises. According to the study, less than a third of all enterprises (29.8%) [30] consider the implementation of environmental projects as a form of social responsibility. This shows that most enterprises do not consider themselves socially responsible for solving environmental problems.

The activities of a little more than half of the enterprises (53.3%) [31] are regulated by environmental legislation (Fig. 1). The main category that adheres to these norms is large (79.8%) and medium-sized (70.8%) enterprises, compared to 51.8% among small enterprises [31]. By industry, the main industries where compliance with environmental legislation is observed are agriculture (78.8%) and production of industrial goods (70.5%) [31].



**Fig. 1.** Enterprises whose activities are regulated by environmental legislation (% of enterprises).

Among enterprises that are operationally subject to environmental legislation, only 19.7% [31] strive to achieve indicators that exceed the established standards. The rest plan to comply with current regulations (Fig. 2.). According to the sectoral distribution, agriculture shows a more pronounced tendency to achieve indicators, exceeding standards, than other sectors of the economy, with a percentage ratio of 33.8% [31].



**Fig. 2.** Taking environmental measures by the beginning of 2023 (% of enterprises).

Enterprises that are operationally subject to environmental legislation show a higher level of responsibility for the environment (application of the regulatory approach). In 2022, 85.3% [31] of such enterprises showed responsibility towards the environment, which compared to 2020 (73.1%) [31] marks a certain progress. However, it is important to note that this indicator is subjective and may affect the real level of responsibility for the environment.

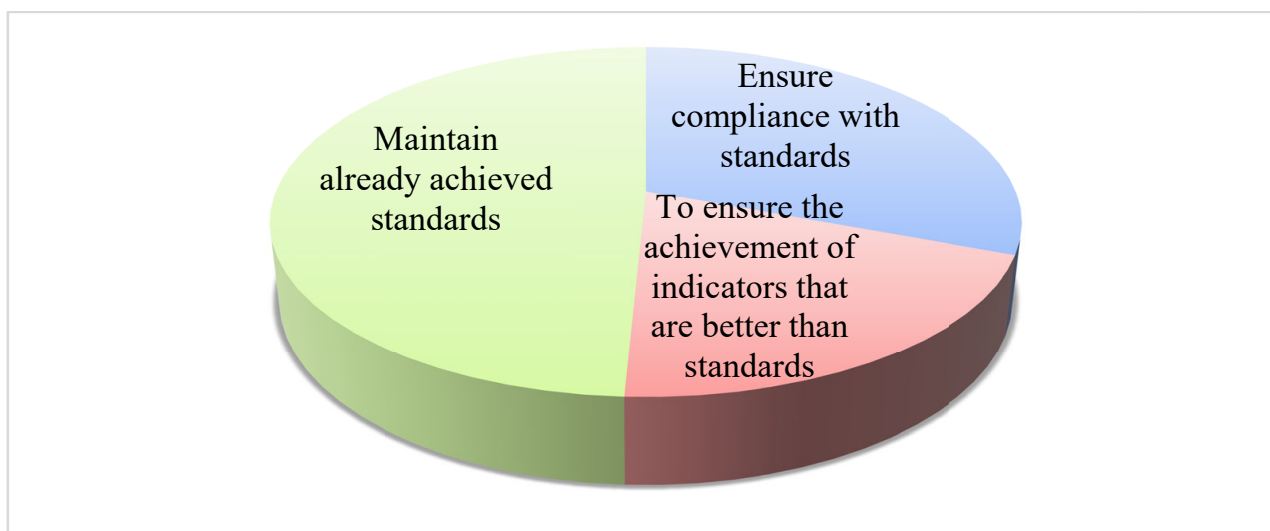
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With a detailed analysis of the Table 1 it can be observed that in recent years there has been an increase in the tendency towards social responsibility, increasing by almost 10% [30]. This indicates that modern enterprises demonstrate a more pronounced socially responsible approach.

**Table 1.** Do you consider your company to be environmentally responsible in 2020 and 2022? (% of enterprises).

	2022 (total)	2022 (those regulated by law)	2020 (total)	2020 (those regulated by law)
Yes	85,3	91,0	73,1	82,8
Hard to say	11,3	1,7	24,3	1,8
No	3,4	7,3	2,6	7,5

Half, namely 52% [32] of enterprises, take environmental social responsibility measures, which is an average of 1.3 measures per enterprise. Among the measures, the most popular are the implementation of energy-saving technologies (42.8%), waste disposal (40.5%), while measures to protect various natural resources are used less - only by 25.6% of enterprises (Fig. 3.) [32].



**Fig. 3.** Tasks of enterprises in the current year regarding the achievement of environmental standards (% of enterprises).

Over the years, the issue of environmental responsibility is becoming more and more relevant both in Ukraine and in the EU countries [1]. This is due to globalization, increasing threats of man-made and environmental disasters, emphasis on a healthy lifestyle, socialization of labor relations and many other factors [1]. In modern economic conditions, environmental responsibility has become an integral part of social responsibility [2]. However, it is important to note that during the formation of the concept of social responsibility, the environmental aspect was recognized as a priority [2].

Let's consider one of the most common approaches to determining corporate environmental responsibility, which is based on three criteria [2]: fulfillment of environmental obligations, energy and raw material management, effective interaction with stakeholders (Table 2).

**Table 2.** Criteria for determining environmental corporate responsibility.

Criteria	Signs of ecological social responsibility
Compliance with environmental obligations	<ol style="list-style-type: none"> <li>1. Corporate vision: compliance with the concept of sustainable development and social responsibility; defining the protection and restoration of the natural environment as strategic priorities.</li> <li>2. Awareness of ecosystems: awareness that the economic system functions within a limited ecosystem.</li> <li>3. Compliance with environmental legislation: compliance with the requirements of environmental legislation.</li> <li>4. Liability for damages: Full responsibility for environmental damage.</li> <li>5. Corporate culture: encouraging a corporate culture based on environmental values.</li> </ol>
Energy and raw material management	<ol style="list-style-type: none"> <li>1. Effective use of resources: rational use of natural resources.</li> <li>2. Use of renewable energy and materials: production and use of renewable energies and materials.</li> <li>3. System thinking: enterprise management based on a system approach.</li> <li>4. Minimization of carbon dioxide emissions: focus on minimizing carbon dioxide emissions.</li> <li>5. Analysis of environmental achievements: constant analysis of environmental achievements and search for new solutions.</li> </ol>
Effective stakeholder engagement	<ol style="list-style-type: none"> <li>1. Informing the public and authorities: informing local communities and authorities about the environmental consequences of activities.</li> <li>2. Responsibility to the community: responsibility to the community and stakeholders for activities.</li> <li>3. Considering the opinions of interested parties: considering the opinions and wishes of interested parties in the development and implementation of projects.</li> <li>4. Transparency of activity: transparency of activities, including information on environmental impact.</li> <li>5. Analysis and reporting: constant analysis and regular reporting on the impact of activities on the environment.</li> </ol>

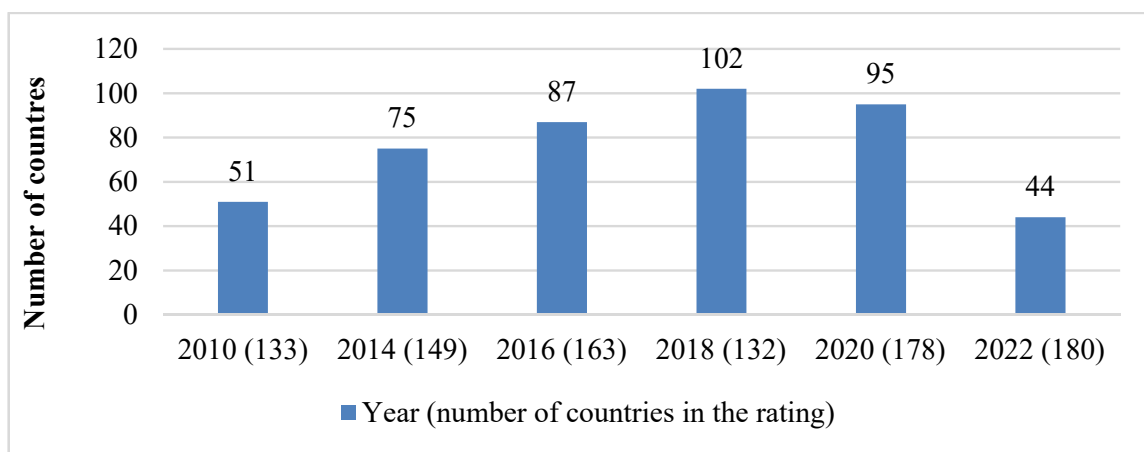
The elements of corporate environmental responsibility defined in [2] include:

- introduction of corporate environmental policy: compliance with environmental legislation; open environmental policy; development of a system of environmental principles and standards;
- environmental audit: determination of priority areas of environmental policy; assessment of the impact of the company's activities on the natural environment;
- involvement of employees in environmental initiatives: education of environmental responsibility of employees; consideration of aspects of environmental ethics;
- environmental friendliness of suppliers: use of environmentally safe raw materials and materials; production of goods using environmentally friendly technologies;



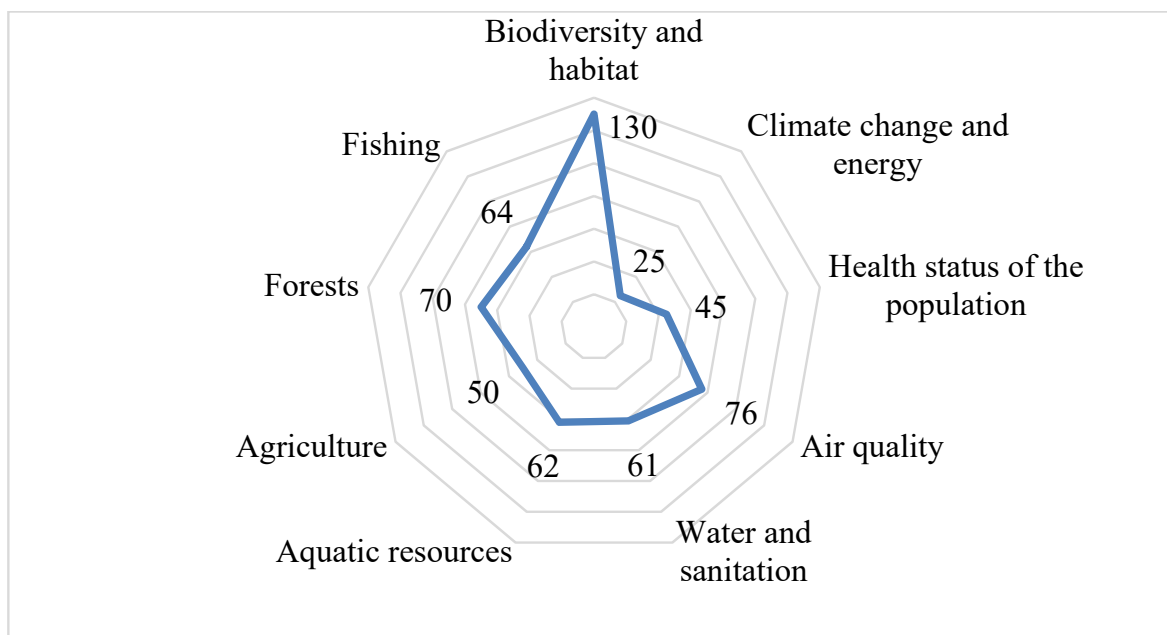
- production of environmentally friendly goods: use of environmentally friendly materials; application of innovative waste processing technologies; use of closed loop technologies, etc.

State management in environmental issues plays an important role, and one of the key components of this process is state regulation [20]. For a more in-depth analysis of the environmental situation in Ukraine, we can use the rating of countries according to the Environmental Sustainability Index, which was developed by the Center for Environmental Legislation and Policy of Yale University (USA) [26]. As of the beginning of 2022, Ukraine was in 44th place in this ranking, having improved its indicators by 25% over the past 10 years [26]. The country was located between Argentina (43) and Cuba (45) (Fig. 4) [26].



**Fig. 4.** Positions of Ukraine in the rankings of 2010 - the beginning of 2022 according to the index of ecological efficiency.

It is important to note that the countries in the rating are divided into 9 categories based on different criteria. A careful analysis of these categories makes it possible to determine the country's strengths and weaknesses in the field of environmental efficiency (Fig. 5).



**Fig. 5.** Positions of Ukraine in terms of evaluation criteria of the ecological efficiency index.

For example, on the overall 44th place in the rating, Ukraine occupies the 130th position among 180 countries according to the criterion "biodiversity and habitat" [26].

This reflects the country's efforts to preserve species within its own borders. As for the indicator of air pollution with nitrogen dioxide, which affects human health and characterizes air quality, Ukraine is in 144th place [26]. According to the indicator of the dynamics of the intensity of carbon emissions per unit of GDP, the country is ranked 25th, showing certain positive trends in this aspect [26].

## 4 Conclusion

The available data and the analysis of the ratings testify to the improvement and growth of environmental awareness in Ukraine at various levels of society. In this context, it is important to note that the use of natural resources by citizens and enterprises is currently carried out in compliance with mandatory environmental standards [27]:

- rational and economical use of natural resources: based on the active implementation of innovative technologies;
- prevention of spoilage, pollution and depletion of natural resources: taking measures to avoid a negative impact on the state of the natural environment;
- use of biological and chemical methods to improve the quality of natural resources;
- economic activity without violating the environmental rights of other persons; preservation of territories and objects of the nature reserve fund subject to special protection.

These principles testify to the growing responsibility and awareness of the importance of environmental aspects in modern society.

The general conclusion is that increasing environmental responsibility at the level of individuals and corporations can make a significant contribution to solving environmental problems and prevent possible conflicts between business, society, and government. It also contributes to improving the perception of domestic producers at the international level. Scientists believe that in order to achieve sustainable development, environmental responsibility should become a life philosophy for society, enterprises and authorities. This means minimizing the environmental impact of the development and growth of economic entities.

Thus, further directions for managing environmental responsibility for SMEs should be based on: studying the impact of specific environmental initiatives on the activities of SMEs and their contribution to sustainable development; researching the reasons and obstacles preventing SMEs from implementing environmentally responsible practices, with the aim of developing strategies to overcome these barriers; supporting research and innovation aimed at the development of new technologies and approaches to reduce the responsible impact on the environment; conducting training programs and information campaigns to raise the awareness of SMEs about the importance of environmental responsibility and the benefits of its implementation; development of incentive programs, subsidies or financial mechanisms to support SMEs in realizing environmental responsibility; stimulating

the exchange of best practices between SMEs and supporting network initiatives for joint solutions to environmental problems; strengthening cooperation with government bodies, public organizations and other stakeholders to jointly solve environmental problems and support sustainable development.

At the same time, it is important to consider that the introduction of environmental responsibility of SMEs will bring significant benefits not only to society, but also to the state. This includes solving key environmental issues, compliance with global economic norms and standards considering the environmental component, as well as preserving the health of the population.

The study is devoted to the coverage and substantiation of research on the main concepts and principles of environmental responsibility of SMEs and was carried out within the framework of scientific topics: 0121U114522 "Entrepreneurship development: management, economic, innovation and investment aspects" (2021-2026) and 0121U110650 "Product quality and safety in domestic and foreign trade and trade entrepreneurship: modern vectors of development and prospects" (2021-2026).

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