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State Legal Policy for Planning Sustainable Development of Recreational Areas: Environmental Risk Assessment for Open Socio-Economic Systems

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ABSTRACT

In the context of global challenges such as climate change, biodiversity loss and environmental pollution, environmental risk assessment is becoming a key tool in planning the state legal policy for the sustainable development of recreation areas. The main purpose of the article is to form a methodological approach to assessing options for implementing state legal policy on sustainable development in recreation areas. The object of study is the recreation areas of Ukraine. The scientific task involves presenting the author's vision of assessing options for ensuring sustainable development in recreation areas. For our purposes, one of the methods of systems analysis was applied - the BOCR method. The BOCR method, including benefits, opportunities, costs and risks, offers a comprehensive approach to evaluating projects, providing a deep understanding of their potential and challenges to make informed decisions. It is commonly used to evaluate the effectiveness of sustainable development projects. As a result of the study, a methodological approach to assessing options for ensuring sustainable development was developed, the results of which made it possible to obtain an information basis for the development and implementation of state legal policy in Ukraine. The existing hierarchical BOCR assessment model and the calculations performed have demonstrated the higher efficiency of the "green" mechanism for planning sustainable development with an emphasis on supporting eco-business in these areas. The introduction of a green planning mechanism promotes environmental sustainability and socio-economic development, while at the same time providing a state legal policy framework for sustainable management of recreational areas. The study has limitations in terms of taking into account the specifics of zones exclusively in Ukraine. Prospects for further research are aimed at expanding and exploring new recreation areas across Europe.

1. INTRODUCTION

The essence of open socio-economic systems in the context of sustainable development of recreation areas should be interpreted as a concept that includes modern ecological, economic, and social aspects of sustainable development planning and management. This is an approach to the interpretation of directions for obtaining an optimal balance between the needs of tourists and the principles of environmental protection. At the same time, recreational and economic needs will be met, stimulating the continuous development of the region, and on the other hand, the recreational area will be protected from threats and dangers. Emphasis on the openness of socio-economic systems is manifested in the key role of the community and ensuring the transparency of management decision-making. In addition, essential characteristics of open socio-economic systems often include the use of innovative approaches to resource management, and decision-making management to ensure environmental sustainability, economic benefit and social justice.

The activities of recreational areas are extremely important for the modern development of the region, in the context of ensuring the sustainability of the local economy, improving the quality of life of the population and implementing coordinated and effective measures to protect the environment. Considering today's environmental problems and challenges, the issue of sustainable development of open socio-economic systems is an important issue not only for the level of local government but also for the state as a whole.

The state plays a key role in ensuring the sustainable development of recreational areas through the formation of

appropriate management and financing policies. Thus, the government of the country can, at its discretion, strengthen or weaken existing environmental norms and standards that directly affect the activities of recreational areas and the state of the environment. Government activities in this area also include the creation and implementation of zoning laws, stimulation of environmentally oriented development programs, attraction of domestic and foreign investment in the field of sustainable development or ecotourism, and others. In addition, the role of the state is especially important in the formation of effective communication between local governments, society, business and environmental organizations, to ensure the sustainable development of the region and the preservation of natural achievements. In doing so, public participation in the planning process helps to incorporate local knowledge and strengths, enhancing the social benefits of recreation areas and ensuring their long-term performance.

For the management of any recreation area as an open socio-economic system, an important issue is legal support and state legal policy. Thus, the state legal policy in this area includes measures to assess environmental risks for open socio-economic systems, integrated and optimized management of natural resources and environmental protection, which in its entirety will form the basis for the formation of a sustainable development strategy for the region. The implementation of this policy will be manifested in the creation and regulation of specific legal acts and development programs aimed at optimizing and controlling the use of land and other natural resources, ensuring biodiversity and monitoring the impact of recreational activities on the state of the ecosystem. At the same time, the key aspect of this activity should be the formation of environmental risk assessment criteria, which will allow us to analyze and detect at an early stage already existing or only potential threats to the environment. The importance of identifying and analyzing environmental risks in the development of recreational areas cannot be overestimated. Activities such as construction, landscaping and the introduction of alien species can lead to environmental destruction, pollution and alteration of the local ecosystem. In practice, this includes the following measures: environmental impact assessment techniques, environmental audit and implementation of the environmental management system. Thus, the state legal policy in this matter is aimed at forming such conditions under which the harmonious coexistence of man and nature will be ensured, the degradation of natural resources will be prevented, and the rights to a healthy environment will be ensured for future generations.

Considering all of the above, the issue of forming an effective assessment of environmental risks in the context of planning the sustainable development of recreational areas is a key issue of modern legal support and public policy. An effective environmental risk assessment system is an important element of strategic planning and management of recreational areas in the context of early identification of potential threats and identification of the main impacts to which the ecosystem where the recreational area is located is exposed. An effective environmental risk assessment process makes it easier to further develop countermeasures optimize key impacts, and enable more optimal use of resources. Thus, environmental risk assessment becomes the basis for making informed decisions in the context of sustainable development, taking into account not only the current needs of visitors to recreational areas but also the long-term interests of preserving the natural environment of future generations.

The main purpose of the article is to form a methodological approach to assessing options for implementing state policy on sustainable development in recreation areas. The object of study is the recreation areas of a specific country. The structure of the article includes a literature review, a description of the methodology, a presentation of the results, their comparison and conclusions.

2. LITERATURE REVIEW

The scholarly discourse on sustainable development, especially in the context of recreation areas, has evolved significantly over recent years, reflecting a growing recognition of the complex interplay between environmental conservation, economic growth, and social well-being. This literature review synthesizes key contributions from various researchers and studies, focusing on the themes of legal security, sustainable tourism, regulatory policy, illegal construction, tax revenue regulation, environmental knowledge, sustainable construction management, the impact of military actions, nature management, corporate social responsibility (CSR), and socio-economic development in the tourism sector.

2.1 Improvement of the modern state legal policy of planning sustainable development of recreational areas

Pylypenko et al. [1] provide a foundational perspective on the legal security of land relations within sustainable development systems. Their work emphasizes the critical role of legal frameworks in ensuring the sustainable use and management of land resources in recreation areas, highlighting the intricate balance required between development and conservation efforts. Kozak et al. [2] address the strategic formation of integrated development within the tourism sector. Their study underscores the importance of crafting comprehensive strategies that not only foster economic growth but also ensure the sustainability of tourism enterprises, thereby contributing to the broader goals of sustainable development in recreation areas.

A study by Alazzam et al. [3] is devoted to the analysis of public management of the system of rational use of natural resources in the context of commercial development of the bioeconomy, with special emphasis on the environmental aspect. The authors focus on legal mechanisms and policy instruments that can promote the sustainable use of natural resources, which is especially relevant for recreational areas. The article examines the current legislative framework and its impact on ensuring environmental safety and preserving the biodiversity of the bioeconomy.

The work of Safonov et al. [4] delves into the analysis of regulatory policies in the context of Eastern European countries' sustainable development. This study sheds light on the critical need for effective policy frameworks that can guide and support the sustainable transformation of recreation areas, taking into account both economic and environmental dimensions. Šostak and Kutut [5] investigate the expansion of illegal construction in protected areas, such as the National Park of Curonian Spit. Their findings highlight the detrimental impact of unauthorized development on the integrity of natural

habitats and underscore the urgency of enforcing legal and regulatory measures to safeguard these critical ecosystems.

Zaichenko et al. [6] explore the regulatory policy concerning tax revenues, emphasizing its role as a cornerstone of state economic security and its implications for sustainable development planning. This research points to the need for optimizing tax revenue management as a means to support environmental and economic sustainability objectives. Okafor et al. [7] examine the relationship between environmental knowledge and the sustainability of policies, particularly in the context of rural communities in Southeast Nigeria. Their study underscores the importance of fostering environmental awareness and understanding as foundational to garnering support for pro-environmental policies and sustainable development initiatives.

2.2 Research and improvement management system of the sustainable development of recreational areas

Araújo et al. [8] contribute a systematic review of sustainable construction management, offering insights into best practices and methodologies that can minimize the environmental footprint of construction projects. Their work is particularly relevant in the planning and development of sustainable recreation areas, where construction activities need to be carefully managed to preserve ecological integrity. Kryshtanovych et al. [9] discuss the public and environmental aspects of restoring sustainable regional development in areas affected by military actions. This research highlights the resilience and recovery of communities and ecosystems post-conflict, providing valuable lessons for sustainable planning in challenging contexts. Baik et al. [10] focus on rational nature management as a component of environmental safety, addressing economic and legal aspects. Their study reinforces the concept that effective management of natural resources is pivotal for ensuring environmental safety and sustainability, particularly in recreation areas where the balance between use and conservation is crucial.

Krupa et al. [11] examine the assessment of the effectiveness of e-business in tourism in the era of digitalization through the prism of a new information system model. This study proposes an innovative approach to the use of digital technologies to improve the management and promotion of recreational areas, emphasizing the potential of information systems in promoting the sustainable development of the tourism industry. In the context of managing the sustainable development of recreational areas, the development and implementation of such information system models can play a key role in achieving a balance between economic growth and environmental sustainability.

Schieg [12] explores the model of CSR in project management, emphasizing its potential to integrate sustainable development principles into corporate practices. This perspective is instrumental in understanding how businesses, especially those operating within or around recreation areas, can contribute to sustainability goals through responsible practices. Lastly, Kryshtanovych et al. [13] address the management of socio-economic development in the tourism industry. Their work highlights the interdependencies between economic development, social equity, and environmental stewardship in the context of tourism, pointing to the need for holistic management approaches that can foster sustainability in recreation areas.

Let's see main gaps in the literature today (Figure 1).

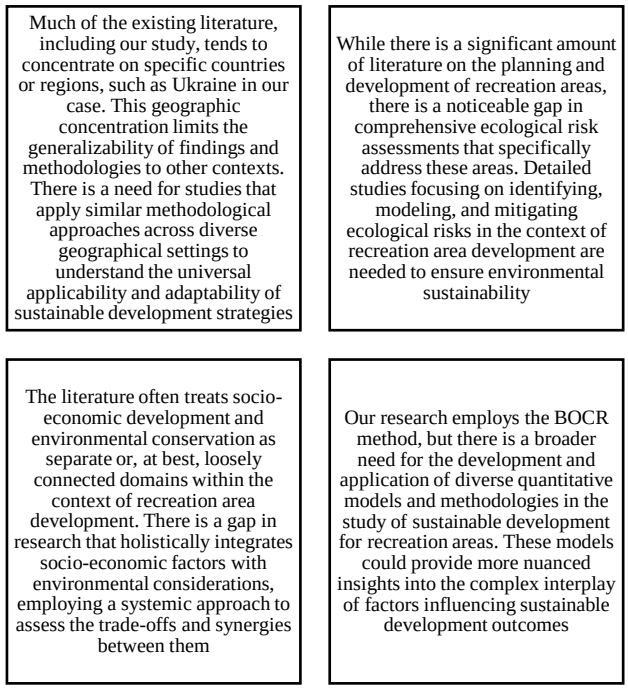

Figure 1. The main gaps in literature

For result, our scientific task involves presenting the author's vision of assessing options for ensuring sustainable development in recreation areas.

3. METHODOLOGY

For our needs, we used one of the methods of system analysis - the BOCR method. It is commonly used to evaluate the effectiveness of sustainability projects. Its distinctive feature is that the assessment takes into account not only obvious but also additional opportunities and ecological risks. It is known that any decision at the state level has advantages and disadvantages that need to be analyzed and, taking into account, a choice made. Some describe specific characteristics of the problem, others may occur with some probability. The expected positive results of the decision are the benefits (Benefits) for recreation areas, and the unfavourable ones are the costs (Costs) for sustainable development. The consequences of decisions that are in doubt can also be both positive and negative. Positive expectations are Opportunities for sustainable development, and negative expectations are ecological risks.

The BOCR method is predicated on the evaluation of four critical dimensions: Benefits, Opportunities, Costs, and Risks. This method is distinguished by its capacity to provide a balanced assessment, taking into account not only the direct outcomes but also the additional opportunities and potential ecological risks associated with sustainable development decisions. This comprehensive approach is crucial for state-level decision-making, where the implications of policy choices can have wide-ranging effects on the environment and society.

The BOCR method is based on the principles of comprehensiveness and balance, providing the opportunity to evaluate a project from different perspectives, including positive and negative aspects. The main idea is to provide an in-depth analysis of the potential benefits and opportunities

offered by the project compared to the associated costs and risks. This approach allows you to make informed and informed decisions, taking into account all the possible consequences of the project. An important principle of the method is also its flexibility, which allows the assessment to be adapted to the specific conditions of a project or strategy, making it applicable in a wide range of situations.

The BOCR method analyzes four key aspects: Benefits, Opportunities, Costs and Risks, which together allow you to assess the potential and challenges of a project or initiative. Amenities describe the positive impact a project can have, such as increased revenue, improved productivity, operational efficiency, or an overall improvement in things. Opportunities indicate the potential opportunities a project offers, including access to new markets, development of innovation, increased market share, or the creation of strategic alliances.

In addition, costs analyze the required resources and investments to implement a project, including financial investments, time costs and the use of human resources. This aspect requires careful planning and management to ensure the project is cost-effective. Risks cover potential threats to a project's success, including financial instability, technical difficulties, competitive pressures, or political changes. Identifying and minimizing risks is critical to ensuring the long-term stability and success of a project (Table 1).

Table 1. Structure of methodology

B	O
This component encompasses the direct positive results anticipated from the implementation of sustainable development policies in recreation areas. Benefits are assessed in terms of their contribution to environmental conservation, social well-being, and economic growth within these zones	Opportunities refer to the potential positive outcomes that might arise from sustainable development practices, beyond the immediately identifiable benefits. These could include the promotion of eco-tourism, enhancement of local biodiversity, and the fostering of community engagement in conservation efforts
C	**R**
The Costs component addresses the direct and indirect expenses associated with the implementation of sustainable development policies. These costs are analyzed not just in financial terms but also in terms of potential social and environmental impacts	Finally, the Risks component evaluates the potential negative consequences that could result from sustainable development initiatives. These risks encompass a range of environmental threats, including habitat disruption, biodiversity loss, and pollution

A key aspect of our methodology involves constructing a hierarchical model for each of the BOCR components. This hierarchical structure allows us to prioritize criteria and evaluate each component systematically. The top level of our hierarchy includes the direct benefits to recreation areas, the opportunities for further sustainable development, the associated costs, and the potential ecological risks. Each of these components is considered an integral prerequisite for making informed decisions aimed at achieving sustainable development. Through the application of the BOCR method, our study provides a nuanced analysis that comprehensively addresses the complexities of sustainable development planning in recreation areas. By considering both the positive and negative aspects of development initiatives, as well as the direct and indirect impacts, we can offer insights that support the formulation of balanced and effective state policies for the sustainable management of recreation zones.

In addition, the binary comparison method, as a complement to the BOCR method, is used to evaluate and compare in detail alternative project options or solutions according to four key categories: benefits, opportunities, costs and risks. In the first stage, each alternative is compared in pairs according to each criterion to determine their relative advantage or disadvantage. The results of these comparisons are then aggregated for each BOCR category, allowing the most balanced and advantageous alternative to be identified. This approach allows for more objectivity and systematization in the decision-making process, enhancing the analytical capabilities of the BOCR method.

4. RESULTS OF RESEARCH

In the context of our research, we presented and examined the recreation areas of Ukraine (Figure 2).

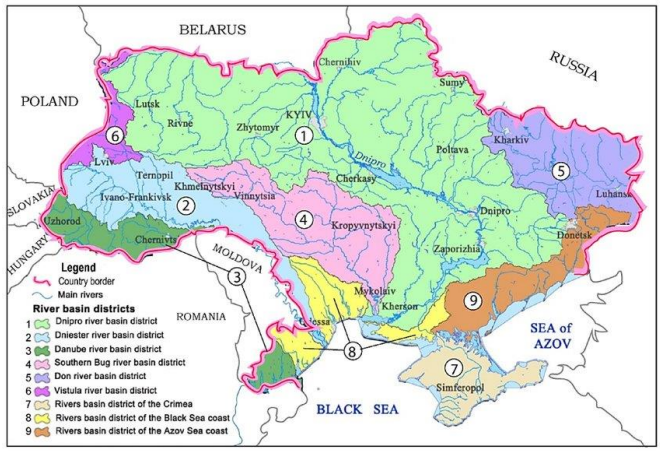

Figure 2. The recreation areas of Ukraine

Recreational areas of Ukraine are faced with a number of environmental challenges that threaten their sustainable development and conservation of natural wealth. One of the main risks is environmental pollution, which includes air pollution from vehicles and holidaymakers, pollution of water bodies due to improper waste disposal and dumping, and soil pollution. Such pollution not only degrades the quality of the environment but also has a negative impact on the health and well-being of local residents and tourists.

Another significant environmental risk is the loss of biodiversity due to uncontrolled urbanization, illegal deforestation and the conversion of natural areas into recreation areas without proper environmental planning. This leads to the destruction of natural habitats, displacement of wildlife and a decrease in local biodiversity. Such actions not only undermine the ecological value and attractiveness of recreational areas, but limit opportunities for future ecotourism and conservation of natural resources for future generations.

Taking into account all four components in the analysis process is the BOCR (Benefits - Opportunities - Costs - Risks) method, in which benefits and opportunities are first grouped, and then costs and ecological risks are grouped. Each of these components is an integral prerequisite for the decision taken

to achieve sustainable development and must be considered separately using a set of (prioritized) criteria. This method consists of constructing a corresponding hierarchy for each component. Top-level of hierarchy: benefits for recreational areas (Benefits), opportunities for sustainable development (Opportunities), costs (Costs) and ecological risks (Risks).

Using the example of the hierarchy of benefits (Figure 3), we will show how to determine global priorities for each of the four hierarchies (BOCR) according to its system of criteria.

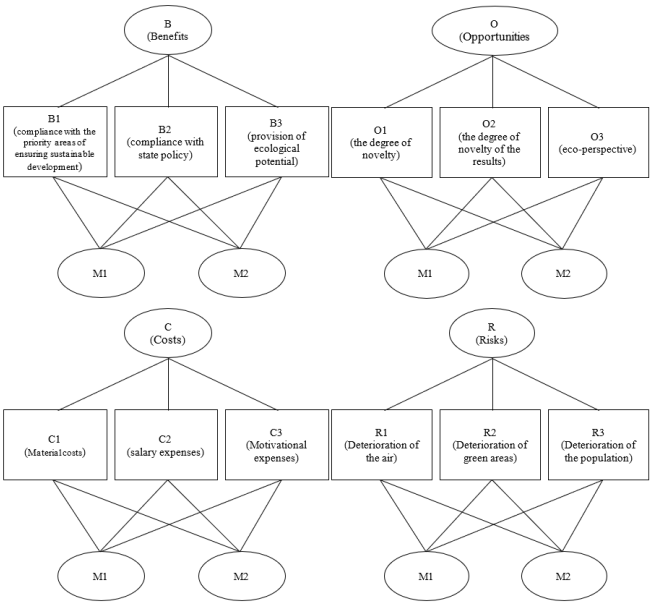

Figure 3. Hierarchy of benefits for each BOCR element

At the lower level of the hierarchy there are comparable different mechanisms for planning sustainable development: M1. Parallel to environmental considerations, the Integrated Community Involvement Mechanism emphasizes the essential role of local communities in the sustainable development process. This mechanism aims to ensure that development benefits the local population economically, respects and preserves cultural heritage, and includes community voices in decision-making processes. Strategies involve engaging local communities in the planning stages through public consultations, ensuring local employment opportunities in the development and operation of recreational facilities, incorporating cultural preservation into development plans, launching education and awareness programs about sustainability and conservation, and establishing benefit-sharing mechanisms to reinvest a portion of the revenue from recreational activities back into local community projects.

M2. The "Green" Planning Mechanism is centered on ensuring the environmental sustainability of recreational areas. This approach prioritizes the conservation of natural resources, the protection of biodiversity, and the reduction of environmental impacts from recreational activities. Key strategies under this mechanism include conducting Environmental Impact Assessments (EIA) to foresee and mitigate negative environmental effects, using sustainable materials and practices in the construction and maintenance of facilities, promoting eco-friendly transportation options like electric vehicles and bicycles, designating conservation zones within recreational sites to protect sensitive ecosystems, and implementing green certification programs to recognize areas that adhere to high environmental standards.

For two objects that are compared with each other depending on the degree of their influence on the process, the importance that makes up the corresponding element of the matrix of binary comparisons will be assessed, and the diagonal elements of the matrix are equal to one, its lower part is filled with inverse values. It is necessary to carry out (n*(n-1)/2, where n is the number of cases at the same level.

Since the hierarchy contains only two alternatives and three criteria, it is necessary to carry out m*(n*(n-1)/2, where m is the number of criteria, that is, it is necessary to compare three pairs of objects of comparison (two selected mechanisms of sustainable development planning).

If the answers agree among themselves, then a=wi/wj, for all i,j=1,m. Consistency means that in the first case, aij=1; aij=1/aij for all i,j=1,m, i.e., if an object surpasses another, then the value is 1/a. In the case of complete consistency $A=(\frac{wi}{wm})=m(\frac{wi}{wm})$. This means that the vector of relative importance is an eigenvector of the matrix itself and corresponds to the eigenvalue $\lambda = m$ of this matrix.

First, to simplify the perception of the calculations, we will bring together the results of comparisons of the criteria of opportunities, costs and environmental risks that arise in the process of applying the selected mechanisms for planning sustainable development relative to the goal (Table 2).

Table 2. The results of the comparison of the criteria for the effectiveness of the planning mechanisms for the sustainable development of recreation areas

B	**O**
$\begin{pmatrix} 1 & 1/7 & 1/5 \\ 7 & 1 & 3 \\ 5 & 1/3 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 3 & 1/7 \\ 1/3 & 1 & 1/9 \\ 7 & 9 & 1 \end{pmatrix}$
C	**R**
$\begin{pmatrix} 1 & 1/2 & 2 \\ 2 & 1 & 3 \\ 1/2 & 1/3 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 2 & 1/7 \\ 1/2 & 1 & 1/6 \\ 7 & 6 & 1 \end{pmatrix}$

Table 3. Comparison of sustainable development planning mechanisms relatively B,O,C,R

B1 (Compliance with the Priority Areas of Ensuring Sustainable Development)	**B2 (Compliance with State Policy)**
$\begin{pmatrix} 1 & 1/3 \\ 3 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 1/7 \\ 7 & 1 \end{pmatrix}$
B3 (provision of ecological potential)	
$\begin{pmatrix} 1 & 1/5 \\ 5 & 1 \end{pmatrix}$	
O1 (the degree of novelty)	O2 (the degree of novelty of the results)
$\begin{pmatrix} 1 & 1/7 \\ 7 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 1/5 \\ 5 & 1 \end{pmatrix}$
O3 (eco-perspective)	
$\begin{pmatrix} 1 & 1/9 \\ 9 & 1 \end{pmatrix}$	
C1 (Material costs)	C2 (salary expenses)
$\begin{pmatrix} 1 & 3 \\ 1/3 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 4 \\ 1/4 & 1 \end{pmatrix}$
C3 (motivational expenses)	
$\begin{pmatrix} 1 & 2 \\ 1/2 & 1 \end{pmatrix}$	
R1 (deterioration of the air)	R2 (deterioration of green areas)
$\begin{pmatrix} 1 & 1/4 \\ 4 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 1/6 \\ 6 & 1 \end{pmatrix}$
R3 (deterioration of the population)	
$\begin{pmatrix} 1 & 1/8 \\ 8 & 1 \end{pmatrix}$	

Next, we will present only the results of the comparison of the selected planning mechanisms for the sustainable development of recreational areas in relation to the BOCR criteria (Table 3).

To establish the degree of consistency of the numerical values of binary comparisons of the elements of the set, the priority vector of the matrix is used, to find which we first calculate the eigenvector W(w1, w2, ..., wm), and then normalize it. The components of the eigenvector are the geometric mean of the elements of each row of the matrix of binary comparisons, i.e., (1):

$$ui=\sqrt[m]{ai1 * ai2 * \dots\dots\dots aim}; i = 1, m \quad (1)$$

where, aij is element i of row j of column of the matrix of binary comparisons of elements of the set, m is the number of cases at the same level.

The relative importance of objects is calculated using the average geometric element of each row of matrix (2):

$$wi=\frac{ui}{\sum_{i=1}^{m} ui} \quad (2)$$

The sum of the normalized vector components is 1.0. Accordingly, we have the following system of equations for calculating weights (3):

$$Ui=wi1*u1j+wi2*u2j+wi3*u3j \quad (3)$$

In our case, we obtain the following for all components (Table 4).

Table 4. Synthesis of generalized priorities of alternatives in each of the four hierarchies

Efficiency Components	Efficiency Criteria (wi)	U	
		M1	M2
B	compliance with the priority areas of ensuring sustainable development (0.07) compliance with state policy (0.65) provision of ecological potential (0.28)	0.14	0.86
O	the degree of novelty (0.15) the degree of novelty of the results (0.07) eco-perspective (0.78)	0.13	0.87
C	Material costs (0.3) salary expenses (0.6) Motivational expenses (0.1)	0.3	0.7
R	Deterioration of the air (0.14) Deterioration of green areas (0.1) Deterioration of the population (0.76)	0.1	0.9

The "Green" Planning Mechanism emerges as the most optimal option for the sustainable development of recreational areas in Ukraine due to its comprehensive focus on environmental sustainability, a critical component in preserving natural landscapes and ecosystems for future generations. By prioritizing the conservation of natural resources and the protection of biodiversity, this approach directly addresses the urgent need to balance recreational development with ecological preservation. Given the global challenges posed by climate change and biodiversity loss, adopting a planning mechanism that integrates Environmental Impact Assessments (EIA) ensures that development projects are critically evaluated for their environmental implications before implementation. This preemptive consideration of environmental impacts not only mitigates potential negative effects on natural habitats and species but also aligns with broader environmental protection goals, fostering a sustainable relationship between human activities and nature.

Sustainable development for Ukraine is an extremely difficult aspect given its political situation, but, in our opinion, green planning is needed, no matter what. At the same time, given the war in its territories, Ukraine faces a unique opportunity to rethink its economic and social development through the prism of green planning. This will not only help reduce environmental impact and improve energy efficiency, but will also ensure a sustainable recovery that takes into account the needs of future generations. Focusing on green investments and clean technologies can also improve Ukraine's energy independence, reduce dependence on energy imports, and promote economic development by creating new jobs and improving the quality of life of its citizens.

5. DISCUSSIONS

Our results present a comprehensive methodological approach to assessing options for implementing sustainable development policies in recreation areas, focusing on the BOCR method. This approach offers a nuanced understanding of the benefits, opportunities, costs, and risks associated with sustainable development projects. In discussing our findings, we compare them with the insights from selected references to highlight convergences and divergences in methodologies, results, and applications.

A critical aspect of sustainable development in any sector is the availability of financial support mechanisms that align with ecological and economic imperatives. Kostyrko et al. explore the dynamics of financial support for sustainable enterprise development under economic and ecological pressures. The authors provide an in-depth analysis of how financial instruments and funding mechanisms can be optimized to support sustainable practices in business operations, particularly in the context of environmental risks and economic challenges [14]. Yildiz and Yercan [15] emphasize the importance of environmental reporting within the context of sustainable development, particularly in industrial and supply chain processes. Our approach complements this perspective by providing a framework for assessing ecological risks and sustainability outcomes in the specific context of recreation areas. Similarly, Baidala et al. [16] focus on improving the system of indicators for measuring the ecological component of sustainable development in regions. Our research extends this by incorporating a comprehensive evaluation model that not only measures but also plans for sustainable development, highlighting the practical application of such indicators in policy-making. Dzemyda [17] and Szromek [18] explore the roles of electronic marketing and business models in promoting international tourism and spa tourism enterprises, respectively. While these studies offer insights into specific strategies for tourism development, our research provides a broader analytical tool that could enhance these strategies by incorporating ecological risk assessments. This ensures that tourism development supports eco-businesses and is aligned

with sustainability principles.

Pokolodna et al. [19] discuss the potential of eco-tourism in strengthening the financial stability of territories. Our findings resonate with this perspective, as the BOCR method enables the identification of sustainable development options that can bolster eco-tourism. Our approach adds value by systematically evaluating how eco-tourism initiatives can be optimized to maximize benefits and minimize ecological risks. Hummel et al. [20] highlight the significance of sustainability performance and the role of accounting assurors in sustainability assurance engagements. Our methodological approach could serve as a foundational tool for these assurors, offering a structured way to assess and report on the sustainability of development projects in recreation areas. The works of Abramova et al. [21] and Pyliavskyi et al. [22] delve into regulatory policies for tax revenue efficiency and modelling ways to improve green growth. Our research supports these themes by demonstrating how a well-defined methodological approach can inform the development and implementation of regulatory policies that promote green growth and environmental protection in the context of recreation areas.

The study by Kronivets et al. [23] examines the legal aspects of the use of artificial intelligence in educational processes, emphasizing the need to develop and adapt legislation for the effective implementation of these technologies. This research is important for understanding how legal regulations can promote or constrain innovation in education. In the context of our research, focused on environmental risk assessment and the development of public legal policies for the sustainable development of recreational areas, one can see the importance of adapting legal frameworks not only in the technological but also in the environmental sphere. Our study complements this dimension by emphasizing the need to develop specific legal mechanisms for the protection and development of natural areas.

At the same time, the study by Kopytko et al. [24] deals with the optimization of financial resources to increase the level of economic security in a dynamic external environment. It offers a methodological approach to adapt to change and ensure stability. This focus on economic security and financial optimization differs significantly from my research, which concentrates on environmental risks and sustainable development. However, both approaches emphasize the importance of adaptability and foresight in management, which are critical components for effective policy in any area.

In the work of Alazzam et al. [25], an information model for e-commerce platforms is developed, with a focus on modern socio-economic systems in the context of global digitalization and legal compliance. This analysis is important for understanding how digitalization is transforming economic relations and what place legal aspects occupy in this process. Our study shares with this study a focus on the need to integrate legal frameworks to support sustainable and responsible development, in this case of recreational areas. Both studies point to the need for a balanced approach to management that takes into account both the technological and environmental dimensions of modern development.

Our comparison reveals that while existing literature offers valuable insights into specific aspects of sustainable development, such as environmental reporting, tourism strategies, financial stability through eco-tourism, and regulatory policies, our research contributes a holistic methodological framework that can be applied to the planning and assessment of sustainable development initiatives in recreation areas. The BOCR method stands out for its ability to integrate a wide range of factors—benefits, opportunities, costs, and risks—into a cohesive analysis, providing a robust basis for informed decision-making and policy development. This approach not only complements the findings of the referenced studies but also extends the scope of sustainable development planning by incorporating a comprehensive assessment of ecological risks, thereby enhancing the sustainability of recreation areas.

Summarizing, we can draw the following conclusions on the innovativeness of the study:

1. Integration of local eco-businesses into sustainable development planning. One of the key innovative findings of the study is the identification of the great potential for integrating local eco-businesses into the processes of planning and implementing sustainable development of recreational areas. This approach not only promotes economic development and investment in the region but also ensures greater ownership and involvement of local communities in the conservation of natural resources. It has been established that green planning mechanisms that take into account the interests of eco-businesses can effectively balance environmental, economic and social goals, thereby ensuring the sustainability of recreational areas.

2. Adaptability of the BOCR assessment model to the specifics of the region. Another innovative conclusion is that the BOCR assessment model demonstrates high adaptability to various specificities of recreational areas, especially in the context of Ukraine. Using this model not only allows for an accurate assessment of the benefits, opportunities, costs and risks associated with different sustainable development options but also provides the flexibility to adapt to local environmental, socio-economic and cultural circumstances. Such adaptability is critical to developing effective sustainable development strategies that address each area's unique needs and capabilities while minimizing potential environmental risks.

6. CONCLUSIONS

6.1 The main conclusions according of the results

In conclusion, let's said that our article provides a comprehensive examination of the critical role state policy plays in the sustainable development of recreation areas, with a particular focus on the ecological risks involved. The main contribution of this work is the development of a methodological approach designed to evaluate and guide the implementation of sustainable practices in the development of recreation zones. This approach, centered around the BOCR method-a versatile tool in systems analysis underscores the importance of a balanced assessment that accounts for Benefits, Opportunities, Costs, and Risks associated with sustainable development projects. Our research has demonstrated the effectiveness of adopting a "green" mechanism for planning, which not only prioritizes environmental preservation and supports eco-business but also ensures the socio-economic upliftment of local communities. Through the application of the BOCR method, we have established a framework that aids policymakers in making informed decisions that align with the goals of sustainable development. This framework is particularly significant in its

ability to model expected outcomes, identify additional costs, explore new opportunities, and importantly, assess probable ecological risks.

It should be noted that in the context of providing policy recommendations, it should be taken into account that the most important thing is to review the legislative framework itself and pay more attention to reducing restrictions in recreational areas and providing more autonomy in management. At the same time, the very fact of strengthening policies to expand, for example, local communities (providing them with access to sustainable development planning systems) is important. Choosing the optimal planning mechanism is only one of the initial steps, but it is necessary that more subjects participate in its implementation as possible.

6.2 Research limitations and future prospects

The empirical application of this methodological approach within the context of Ukraine has yielded valuable insights, particularly highlighting the superiority of green planning mechanisms in promoting sustainable development in recreation areas. Our findings suggest that such an approach not only fosters economic growth and environmental preservation but also enhances social well-being by providing spaces for recreation and community engagement. However, it is important to acknowledge the limitations of our study, primarily its focus on the recreation zones within Ukraine. This geographical specificity, while providing in-depth insights into the local context, may limit the generalizability of our findings to other regions. Hence, future research should aim to apply and test the developed methodological framework in diverse geographical and cultural settings, thereby expanding its applicability and relevance.

Looking forward, the prospects for further research in this domain are vast and promising. Expanding the scope of study to include new recreation areas across Europe and potentially beyond can offer a broader understanding of the challenges and opportunities associated with sustainable development in diverse contexts. Such research could explore the adaptability of the BOCR method to different environmental, economic, and social conditions, providing a richer, more nuanced understanding of how to balance development with conservation. This article underscores the essential role of state policy in navigating the complex terrain of sustainable development within recreation areas. By adopting a methodological approach that comprehensively assesses ecological risks alongside economic and social factors, policymakers can better ensure that the development of recreation zones contributes to the long-term health and vitality of both the environment and the communities they serve. The findings of this study not only contribute to the academic discourse on sustainable development but also offer practical insights for policymakers, environmentalists, and stakeholders involved in the planning and management of recreation areas.

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