

Title: **Is it possible to implement a participatory governance in biosphere reserves in Slovakia?**

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Abstract:

In times of climate crisis, the importance of biosphere reserve as a model territory of sustainable spatial development is increasing. Even the concept of biosphere reserve was developed by UNESCO in 1970 as a part of scientific programme Man and Biosphere, the current global problems emphasize the necessity to follow their principles containing support of biodiversity, conservation, sustainable development, capacity building for research, education and learning at regional scales in practice. Moreover, both research and management of biosphere reserve need to be people-centred and directly linked to policy formulation. Various empirical studies confirm that the stakeholder participation and active civic engagement in the management of biosphere reserves has many positive effects, particularly in terms of strengthening and developing social capital, increasing efficiency in the promotion and implementation of decisions in which stakeholders have participated, increasing accuracy in the use of a diversified knowledge base, strengthening co-management, or strengthening stakeholder accountability to the territory in the process of its management and conservation.

The aim of paper is to evaluate the application of participatory governance in Slovak biosphere reserves in comparison with the guidelines of UNESCO as well as theoretical framework and identify its weaknesses and strengths. In the paper, we research the current state of participatory governance of 4 biosphere reserves in Slovakia based on the secondary data from the official reports and websites of biosphere reserves as well as interviews conducted with the managers of biosphere reserves. They will be compared with the recommendations defined by Technical guidelines of UNESCO for biosphere reserves. The results include an identification of problem areas in implementation and subsequently, the proposals how to solve them with considering examples of good practice.

Points for practitioners

The paper is on practice oriented. It researches the issue of participatory governance implementation in real conditions of biosphere reserves. The research results and especially the suggested recommendations for the problem areas of participatory governance in biosphere reserves can be a source of inspiration for managers in biosphere reserves worldwide because the topic is very undervalued in research and not enough attention is paid to it.

Keywords: biosphere reserve, governance bodies, participatory governance, stakeholders, sustainable development.

Introduction

The climate change and its consequences call for new solutions how to manage optimally the limited resources of territories. Even it is a great challenge, there are some model territories already in a form of biosphere reserve that in a form of symbiosis looking for the optimal use of nature resource to satisfy the needs of citizens while preserving the natural wealth. Biosphere reserves were established in the 1970s under the auspices of the UNESCO Man and Biosphere Programme (MAB). Biosphere reserves constitute geographically diverse areas wherein a land management approach that fosters the harmonization of human-nature interactions is implemented (Batisse, 1985; UNESCO, 1996; Bridgewater, 2002). These territories represent distinct ecological and cultural landscapes with a dual role and mission that benefits both natural systems and human population. It is possible to define them as a sustainable living lab demonstrating an acceptable equilibrium and a balanced human relationship with the natural environment. Their significance extends beyond local populations, encompassing broader societal benefits. As of the current date, the global network of biosphere reserves comprises 727 sites across 131 countries, with 22 of these being transboundary reserves. (UNESCO, 2021).

The concept of biosphere reserve looks for synergy of nature protection and conservation, but also the nature exploitation in the economic and social development activities. It is also the main difference between the “classical” protected area and biosphere reserve. It is supported by main functions of the biosphere reserves defined as conservation, which emphasizes protection at multiple scales, encompassing landscapes, ecosystems, species, and genetic diversity; development, which aims to ensure the economically and socially viable development of the territory in a socio-culturally and ecologically sustainable manner; and logistical support, which includes the provision of support for demonstration projects, environmental education and training initiatives, as well as research and monitoring activities relevant to local, national, regional, and global issues concerning conservation and sustainable development (Vološčuk, 1998; Donevska, 2021). The development activities are associated primarily with the buffer zone of biosphere reserve, which surrounds the core area, the most strictly protected and ecologically significant portion of the territory, and transition zone. The buffer zone mitigates the impact of human activities on the core area and is essential for the conservation of both biological and cultural diversity. The transition zone serves as the foundation for the management and sustainable utilization of natural resources. A broader spectrum of economic activities that contribute to the socio-economic development of the local population can be accommodated here. However, these activities must be conducted in accordance with the specific conservation and sustainable development objectives of each individual biosphere reserve (Fabriciusová, Slávik, 2010). One of the preconditions to do it is to use the participatory governance as a form of management of the territory (Sagie, Orenstein, 2022; Bouamrane et al., 2016; Stoll-Kleemann, O’Riordan, T, 2002; Monge-Ganuzas et al., 2023). In view of these facts, the paper aims to evaluate the application of participatory governance in Slovak biosphere reserves in comparison with the guidelines of UNESCO as well as theoretical framework and identify its weaknesses and strengths. Based on the results of evaluation, following the Technical guidelines of UNESCO for biosphere reserve and good practice in management of biosphere reserves we formulate the recommendation for the management of biosphere reserves in Slovakia.

The remainder of the papers is organized as follows. Section 2 is theoretically oriented on the definition of participatory governance in biosphere reserves, its specifics and key stakeholders. Section 3 details the methodology of realized research and characterizes the data used. The third section is devoted to the presentation of the research results. It maps the management structure in all 4 Slovak biosphere reserves and compares it with the recommendations in Technical Guidelines of UNESCO in a form of scientific discussion. To conclude the paper, we summarize the main research findings, formulates the main challenges in further development and present the good examples in management of biosphere reserve which can be a source of inspirations for Slovak ones.

Participatory governance in biosphere reserves

Essential for developing biosphere reserves is the government's support and the involvement of stakeholders falling directly within or outside the area. The need for stakeholder participation and involvement has become even more prominent in recent decades, whether in research, policy or practice in natural resource management and biodiversity conservation. Stakeholder participation links the ecosystem of area and society in a collaborative manner, increasing the chances of success in land management and valuation (Schultz, Duit, Folke, 2011; Nikolakis, 2020; Folke, Berkes, 1998; Holling, 2001; Dearden, Bennett, Johnston, 2005; Slocum-Bradley, 2003; Reed, 2008; Folke, Hahn, Olsson, Norberg, 2005; Walker, et. al. al, 2002; Folke, Colding, Berkes, 2003). Participatory governance approach highlights the local community, citizens and other relevant stakeholders as important participants in, the management, decision-making, and planning and development of the reserve, whose existence affects them in many areas (Holmes, 2014; Reed, Price, 2020; Mondino, Beery, 2019). They are key actors in biosphere reserve management (Stoll-Kleemann, Welp, 2008). Also, Van Cuong, Dart and Hockings (2017) argue that also for a strategic development plan the stakeholder participation is needed, especially to implement the concept and objectives of biosphere reserves successfully. Involving different parties in the strategic planning process to reach consensus on biosphere reserve objectives is crucial because by aligning stakeholders' interests, concerns and willingness to participate, sustainability of development can be achieved (Pulsford, Fitzsimons & Wescott, 2013; Kearney et al., 2007; Smulders-Dane, Smulders-Dane, Smits, Smits, Fielding, Chang, & Kuipers, 2016). By promoting the collection and integration of knowledge, expertise and experience from different stakeholders, the management of the biosphere reserve can address more effectively the issues in the biosphere reserve community and contribute to its solutions. To the key stakeholders of biosphere reserves belong local citizens and communities, local entrepreneurs, representatives of local municipalities, non-profit organisations in various areas (especially environment, cultural and social), educational institutions and research centres. The last one type of stakeholders is very important due the fact that the UNESCO programme Man and Biosphere is a research program based on transfer of research to practice. Due to their scientific credibility, universities can play a catalytic role by initiating and reflecting on the processes. With such an approach, universities would offer opportunities for research and participation and a place for sustainability learning (Walk, Luthardt, Nölting, 2019). Moreover, the management of biosphere reserves is influenced also by the regional government, public administration authorities at the national and international level.

There is no specific definition of biosphere reserve bodies or structure of participatory governance. Technical Guidelines of UNESCO (2022) stresses the originality and uniqueness of each biosphere reserves and respects its own framework in each state. This document includes the set of recommendations in articles (120 – 134) settled for the biosphere reserves how to manage the spatial development participatory and in line with the aim of

programme Man and Biosphere. Every designated biosphere reserve is structured with an operational entity. The designated title for the responsible individual(s), such as manager, coordinator, or director, depends on localized circumstances and/or regulatory framework. The overarching body that guides and facilitates the administration of a biosphere reserve, and employs the relevant personnel, is commonly identified as the biosphere reserve management authority. This organizational framework is tasked with enacting the established management plan or policy.

The managerial personnel within biosphere reserves necessitate a multidisciplinary team possessing a broad spectrum of expertise and knowledge. Their primary function emphasizes facilitation and coordination rather than direct enforcement or custodial duties. Consequently, managers require specialized competencies to ensure the longevity of the biosphere reserve beyond its initial designation phase. The core responsibilities of these managerial roles include motivation, facilitation, and negotiation, alongside active engagement with local communities to foster and inspire sustainable modes of living and economic activity. Governance frameworks serve as mechanisms to enable stakeholder engagement in the management of a biosphere reserve and to facilitate the attainment of their objectives in a sustainable manner, as articulated within a management policy or plan. Furthermore, these structures function as impartial platforms for the resolution of conflicts, the execution of nature conservation initiatives, and the promotion of sustainable development, among other functions. Over time, participatory engagement has evolved to constitute a fundamental fourth function of biosphere reserves. Local communities and relevant stakeholders should participate in the majority, if not all, facets of biosphere reserve management and decision-making processes. Participation holds conceptual significance and offers pragmatic advantages for biosphere reserve managers/coordinators, stakeholders, communities, and the dependent environment. Enhanced stakeholder involvement strengthens support and improves management efficacy. Moreover, it fosters empowerment, capacity building, and the development of credibility and trust regarding implemented practices. For stakeholders and communities, participation equates to a more influential role in decision-making and the opportunity to contribute to critical issues affecting their livelihoods.

Technical guidelines (2022) recommend 3 main bodies that include the governance structure. The first body is a management team of the biosphere reserve consisting of full-time professional staff allocated a specific budget to undertake concrete operational activities. The second body is a steering committee composed of key stakeholders. It possesses decision-making authority and collaborates closely with the management team. The committee is responsible for formulating proposals for the implementation of the management policy or plan and is also tasked with evaluating the progress of its implementation. The third body is an advisory board, which may be assigned a specific mandate pertaining to oversight and/or consultation. These bodies can cooperate with or consists of various stakeholders as traditional authorities, civil society, local communities, universities, research centres, representatives of private sector and other. In case of transboundary biosphere reserves, national governance structures are responsible for the respective national parts of the site, while a joint governance structure coordinates and plans transboundary activities, if it is created.

However, the recommendations are implemented at the national level and in governing of biosphere reserves, they highlight the importance of stakeholder participation and see them as a fundamental principle of governance. Some authors (Brunckhost, 2001; Van Cuong, Dart, & Hockings, 2017; Walk, Luthardt, & Nölting, 2019) add that the stakeholder participation and collaboration are also critical for good governance, whether in formal or informal

structures. However, establishing informal governance by local communities or NGOs could undermine their functioning because they lack authority.

In management of biosphere reserves, the role of stakeholder participation increases social acceptance and support (Stoll-Kleemann, Welp, 2008; Stoll-Kleemann, De la Vega-Leinert, & Schultz, 2010; Albert, Zimmermann, Knieling, & von Haaren, 2012), but government commitment, involvement, and understanding of the role of participation at the local level is also critical to real implementation of biosphere reserve concept (Van Cuong, Dart, & Hockings, 2017). In practice, intended outcomes are only achieved through participation and negotiation between stakeholders and institutions (Bouamrane, 2007). Many studies point to the need for government involvement in biosphere reserve planning and point to positive impacts, particularly in the context of co-management, which requires the involvement of both communities and governments (Carlsson, Berkes, 2005; Cash, Moser, 2000; Berkes, 2007). The negative impact of government involvement in biosphere reserve planning has had on the plan's quality in terms of management's ability to protect ecosystems (Brody, 2003). The authors also agree that a top-down approach to biodiversity conservation makes the process of biosphere reserve management more difficult, as people-centred management and conservation are more likely to succeed than strict protection by an authoritarian government (Stoll-Kleemann, Welp, 2008; Schultz, Lundholm, 2013; Schultz, Duit, Folke, 2011; Wilshusen, Brechin, Fortwangler, & West, 2002). Despite positive or negative impacts of, authors point to the need for government support for the sustainable development of biosphere reserves (Van Cuong, Dart, Dudley, & Hockings, 2018; Engelbauer, 2023; Wager, 1995). A management of biosphere reserve should be inclusive, based on stakeholder engagement, with adequate allocation of finance and human resources (Van Cuong, Dart, and Hockings, 2017).

Data and methodology

Paper aims to evaluate the application of participatory governance in Slovak biosphere reserves in comparison with the guidelines of UNESCO as well as theoretical framework and identify its weaknesses and strengths. In the paper, based on the secondary data from the official reports and websites of biosphere reserves as well as interviews conducted with the managers of biosphere reserves we research the current state of participatory governance in 4 biosphere reserves in Slovakia and evaluate them based on the recommendation of Technical Guidelines of UNESCO. To reflect the weakness and obstacles in participatory governance of the Slovak biosphere reserves and its further development we present also the good examples from biosphere reserves in Switzerland and Sweden to get inspirations and formulate recommendations based on the Technical Guidelines of UNESCO.

Research results and discussion

In Slovakia, four biosphere reserves are established. The first Slovak biosphere reserve - the Slovak Karst - was proposed for designation in 1976. This biosphere reserve contains remnants of prehistoric ecosystems and cultivated areas. The Slovak Karst is also a national park, which was not originally considered as a biosphere reserve. However, in 1977, the International Coordinating Council for Man and the Biosphere in Paris declared the national parks to be legitimate members of the global network of biosphere reserves. This marked the beginning of a new era of international cooperation in scientific research, conservation, education and management in large, protected areas, and the Slovak Karst became the first biosphere reserve in Slovakia. The second biosphere reserve,

the Poľana Protected Landscape Area, was designated in 1990. The Tatra Mountains Biosphere Reserve became the third and the Eastern Carpathians Biosphere Reserve became the fourth in 1993. Both are designated as transboundary reserves. The Eastern Carpathians were the first trilateral biosphere reserve in the world (Poland, Slovakia and Ukraine). All Slovak biosphere reserves became members of the UNESCO/ Man and the Biosphere global network of biosphere reserves.

For the coordination and implementation of program Man and the Biosphere and thus also the concept of biosphere reserve, the Slovak commission for UNESCO programme Man and the Biosphere was established in 1993. It was a successor of the former Czechoslovak Committee for the UNESCO Man and the Biosphere Programme, which had been working since 1971. The tasks of commission are to coordinate activities in the UNESCO Biosphere Reserves in the Slovak Republic with the aim of their sustainable development (ŠOP SR, 2025). Currently, it has 21 members covering various expert fields and entities including employees of the State Nature Protection of the Slovak Republic, Ministry of Environment of the Slovak Republic, universities, representatives of Slovak biosphere reserves, coordination council of Poľana Biosphere reserve and land managers.

The Slovak biosphere reserves have no legal form. Three of them (Slovak Karst, Tatras, Eastern Carpathians) overlay with the national parks. Biosphere reserve Poľana overlays with the protected landscape area. It influences also the main governance structure of all Slovak biosphere reserves, which is identified in the following text.

Poľana Biosphere Reserve

Poľana Biosphere Reserve overlays with a territory of protected landscape area which is in hands of State Nature Protection of the Slovak Republic. A protected landscape area is a larger territory, generally with an area of over 1,000 hectares, with scattered ecosystems significant for the preservation of biological diversity and ecological stability, with a characteristic appearance of the landscape or with specific forms of historical settlement. In the territory of a protected landscape area, in accordance with Act No. 543/2002 Coll. on Nature and Landscape Protection, the second level of protection (§ 13) applies. The biosphere reserve is headed by a manager who is responsible for the implementation of the strategic development documents and the fulfilment of the functions of the biosphere reserve. In case of the Poľana Biosphere Reserve, the manager is the same person as a director of a Protected Landscape Area Poľana, currently Vladimíra Fabriciusová. In 2017, she was awarded by the Michel Batisse Award for the best management of the biosphere reserve for her management and work based on an inclusive approach and cooperation with stakeholders.

There is only one specific employee – a coordinator of biosphere reserves working for Administration of Protected Landscape Area Poľana. The rest of employees covering all important positions as zoologist, botanist, landscape architect, inorganic, forester, employee of guard service, environmental educator are primary focused at governance of protected landscape area. But naturally and voluntarily, these employees realise also the activities within the biosphere reserve.

A collegial body that ensures the stakeholders engagement, is the coordination council of the Poľana Biosphere Reserve. It is established as a civic association, a legal entity. It brings together experts, entrepreneurs, non-profit organisations, but also elected representatives of the municipalities within the area of the Poľana biosphere reserve. The coordination council has a steering committee that can be compared with the steering committee recommended by the Technical guidelines of UNESCO. It includes the manager of biosphere reserve as well as the key stakeholders of the territory. All members of the association create the general assembly.

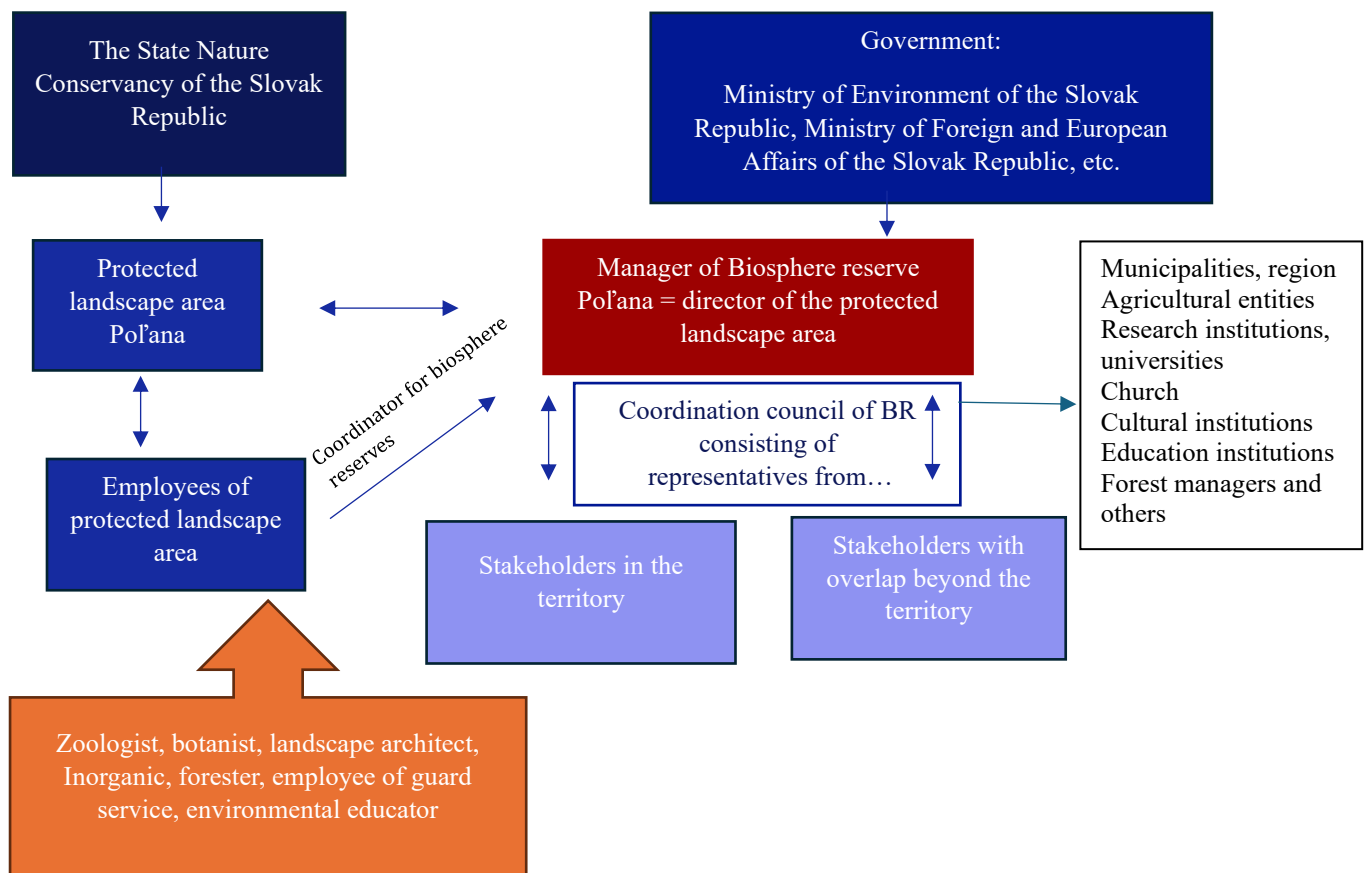
The Coordination Council is a basic prerequisite for a participatory approach to the management of the development of the area. The Coordination Council ensures the development and implementation of the management plan, business plan, marketing and communication strategy of the biosphere reserve. It discusses jointly solutions to the problem areas of the territory's development and actively involves the relevant stakeholders of the territory in the decision-making processes. Currently, the Coordination Council of the Poľana Biosphere Reserve through regular meetings and projects associate 43 representatives of local governments, entrepreneurs, NGOs and citizens. (ŠOPSR, 2022; Vitálišová, Vavrušová, Piscová, 2023; Et. al., 2014; Špulerová et al., 2023, Izakovičová et al., 2025).

Members of coordination councils take part also in the advisory committees for selected areas of the development in the biosphere reserves (e.g. social services, education, etc.). They are advisory bodies for decision-making in the areas following the needs of the biosphere reserve.

The created governance structure of Poľana Biosphere Reserve is unique and covers the legislative gap of biosphere reserve definition and its management (Vitálišová, Miňová, Vaňová, 2021). The civil association „coordination council“ can enter into the legal relationships, be a recipient of funds or donations, can be an active partner in development activities or comment the development intents within the territory and thus to influence the economic, social and environmental development of the biosphere reserve.

The governance structure including the horizontal and vertical relations presents figure 1.

Figure 1: Model of Poľana Biosphere Reserve stakeholders



Source: own elaboration

Biosphere reserve Tatras

The Tatra Biosphere Reserve, which was established by the MAB Programme in 1993, is located in the northern part of the Slovak Republic. The region of the Tatra Mountains proved to be an ideal area for a biosphere reserve. The area of the biosphere reserve includes two national parks and their protection zones located on both sides of the Slovak-Polish border. The Slovak part consists of the Tatra National Park (TANAP) and the Polish side consists of the Tatrzański Park Narodowy (TPN). Historically, the area has been characterised by a rich cultural tradition, which was created by long-standing settlement, pastoralism, agriculture, mining and the gradual development of tourist activities. In the 1980s, several discussions and negotiations took place which resulted in the official recognition of the area of these national parks as the International Biosphere Reserve of the Tatra Mountains. The subsequent extension of the reserve in 1998 ensured that the MAB programme criteria were better met, particularly in terms of involving local communities and creating buffer zones to protect core areas from negative impacts. The current director of the national park is Peter Olexa. He is also a manager of the biosphere reserve. But the other bodies of the biosphere reserve are not constituted.

From 2022, by the reform of act on nature protection, the national park is a state contributory organisation established by the Ministry of Environment of the Slovak Republic. The national park is administered by the administration of the national park, what is a professional organisation for nature and landscape protection, which provides tasks in the field of nature and landscape protection in the territory of the national park and its protection zone, as well as in other territory defined in the decision of the ministry, which establishes the territorial scope of the national park administration (Act no. 6/2022 amending Act No. 543/2002 Coll. on Nature and Landscape Protection, as amended, and amending and supplementing certain acts). The organisation structure of the Tatra National Park Administration includes more than 120 employees. It covers all responsibilities of national park as nature and landscape conservation; forest ecosystem and tree gene pool care; science and research; land tenure and reprivatisation; investment, asset management and project coordination, environmental education etc. For the specific purposes there are established various centres (e.g. centre for the care of the gene pool of trees, fish, tourist infrastructure) as well as museum. By the reform in 2022, the national park board was established. It acts as an advisory, expert, consultative and initiating body for the affairs of the respective national park, whose composition and competence is regulated by the statutes of the national park board. The members of the Tatras national park board includes researchers, director of the TANAP Administration, the director of the Polish TPN, the Ministry of Environment of the Slovak Republic is represented by the director of the department of national parks administration. To other members belong the director of the Mountain Rescue Service, representatives of local municipalities of Vysoké Tatry and Štrba; representative of the non-state forest owners, the director of the Kežmarok town forests, the ecologist and activist Erik Baláž, the chairman of the Slovak Mountaineering Association, the former mayor of the High Tatras, representatives of the former management of the former TANAP Administration, who are to help the national park with their valuable experience and advice (TANAP, 2022).

Even the Tatra National Park is managed by the set of managers and includes also wide structure of the employees, that covers all work areas which are crucial also for the biosphere reserve (only partially the development function), there is paid a minimal attention to it. There exist no specific governance bodies of biosphere reserve. It can be influenced by the long-term tradition of national park in this territory as a primary preferred type of protected territory, and partially also by the reform of national parks in 2022.

Biosphere reserve Slovak Karst

The Slovak Karst is situated in the south of Slovakia near the border with Hungary in the districts of Rožňava and Košice - surroundings. The territory is formed by a system of plateaus with a number of underground and surface karst phenomena, river canyons and gorges that separate these plateaus from each other. Covering an area of 355 km², it is the most extensive karst area of the plateau type in Central Europe. In 1977, the Slovak Karst was the first in Slovakia to be included in the international network of biosphere reserves under the UNESCO Man and the Biosphere programme. The caves of the Slovak Karst and the adjacent Aggtelec Karst in Hungary have been inscribed on the UNESCO World Heritage List since 1995. Currently, the Slovak Karst Biosphere Reserve is a member of the Cave MAB network, which brings together biosphere reserves with caves and karst areas around the world.

In 2022, the same reform as in case of Tatra National park, established the Slovak Karst as a legal entity, specifically a state contributory organisation established by the Ministry of Environment of the Slovak Republic. The seat of the national park is in Brzotín. The head of the national park is a director Martin Golian. The organisational structure of the Slovak Karst National Park Administration includes departments focused on nature and landscape protection; forestry; science and research; monitoring the status of natural components and processes; environmental education and awareness; conservation; asset management and investments.

In 2015, in biosphere reserve Slovak Karst was established a coordination council of biosphere reserve containing 15 members with various background as representatives of local municipalities, civic associations in crafts, cycling tourism, museums, schools etc. However, it was not very active body, which was replaced in 2022 by the national park board (Slovak Karst, 2025). So, we can summarize that even there were implemented some activities in application of biosphere reserve governance, due to the reform of national parks, they were stopped, and the governance of national park was prioritized.

Biosphere reserve Eastern Carpathians

The International Biosphere Reserve "Eastern Carpathians" is located in the western part of the Eastern Carpathians, on the territory of three countries, namely Slovakia, Poland, and Ukraine. According to the geographical division, it lies on the territory of the Western Bieszczady Mountains, the southern part of which is called the Bukovské vrchy (Bukov Mountains). Because it is a border area, the anthropogenic influence here has been less than in other parts of the Carpathians, which has contributed to the preservation of the original ecosystems. It is managed by the Administration of the Poloniny National Park with its seat in Stakčín. The administration of the Poloniny National Park is headed by a director Martin Šupina. The organisational structure includes expert departments as nature and landscape protection; ecosystem care; staff for the specific conservation district (NP Poloniny, 2024).

The Poloniny National Park Council performs tasks in the field of nature and landscape protection in the territory of the Poloniny National Park and its protection zone, as well as in other defined areas in accordance with the statute of the Poloniny NP Administration. The council's competence is to discuss and issue recommendations on strategic and program materials, proposals for the protection and development of the area of competence within the competence of the Poloniny NP Administration. The council may identify problems and opportunities in the field of nature and landscape protection, tourism development, rural development and support of the local economy and submit proposals to the Poloniny NP Administration for solving the identified problems and using the

opportunities. The members of the National Park Council are the director of the NP Administration; two representatives of the Ministry of the Environment; five representatives of local and regional authorities; one representative of tourism organizations; two representatives of non-profit organizations; two representatives from the academic or scientific community; five representatives of land managers in the NP (outside the NP Administration); one representative of the Slovak Tourists Club; two representatives of cross-border cooperation; one representative of water managers

Even, the territory of Eastern Carpathians has a status of a biosphere reserve, all the activities as well as governance structure do not reflect this fact. There is not attention paid to the governance structure of the biosphere reserve.

Discussion

The concept of biosphere reserves, established under UNESCO's Man and Biosphere Programme (MAB) is implemented more than 50 years. The current progressive development in society as well as the treats that it has brought show that this specific harmonization between humans and nature can be a suitable way to sustainable development. Moreover, it balances the conservation efforts with socio-economic activities. In Slovakia, four biosphere reserves—Slovak Karst, Poľana, Tatra Mountains, and Eastern Carpathians—are a part of the global UNESCO network of biosphere reserves.

Based on the literature review as well as with the support of Technical guidelines of UNESCO (2022) one of the key principles of management of biosphere reserves is a participatory governance (Holmes, 2014; Reed, Price, 2020; Mondino, Beery, 2019). Its core is an active engagement of local communities, stakeholders, and various institutions in the management and decision-making processes of biosphere reserves. This approach is essential for fostering social capital, enhancing decision-making accuracy, and ensuring sustainable development. Key stakeholders typically include local citizens, entrepreneurs, municipal representatives, non-profit organizations, educational institutions, and research centers. The composition of the stakeholders varies by the type and character of the biosphere reserve. The forms of stakeholder engagement depend on the legal framework, as well as the established governance structure which reflects the originality of each country where the biosphere reserve is situated. It is in line with the recommendations of Technical guidelines of UNESCO (2022).

The practice in Slovak Republic shows various level of implementing participatory governance as a part of management in biosphere reserves. The most developed participatory governance is implemented in governing Poľana Biosphere Reserve. The Poľana Biosphere Reserve stands out with its inclusive governance structure managed by the State Nature Protection of the Slovak Republic, with a coordination council acting as a civic association. This council includes a steering committee. It engages 43 representatives from various sectors. The inclusive approach and stakeholder engagement have been recognized internationally, exemplified by the Michel Batisse Award. However, there is limited dedicated staff for biosphere reserve activities, relying heavily on voluntary contributions from employees focused on the protected landscape area.

The Tatra Mountains Biosphere Reserve is managed by the Tatra National Park Administration, with a national park board established in 2022. The board includes diverse stakeholders, such as researchers, local government representatives, and non-state forest owners. The comprehensive organizational structure with over 120 employees covers various essential functions. Despite this, minimal attention is paid to biosphere reserve-specific governance, influenced by the long-standing tradition of national park management.

The Slovak Karst Biosphere Reserve is managed by the Slovak Karst National Park Administration, with a coordination council established in 2015 but replaced by a national park board in 2022. Initial efforts to establish a coordination council for stakeholder engagement were made, but the governance of the national park is prioritized over biosphere reserve activities, leading to limited participatory governance.

The Eastern Carpathians Biosphere Reserve is managed by the Poloniny National Park Administration, with a national park board fulfilling advisory and consultative roles. The preservation of original ecosystems due to less anthropogenic influence is a strength, but there is a lack of attention to biosphere reserve-specific governance, with activities and structures focused on national park management.

UNESCO's Technical Guidelines for biosphere reserves emphasize the importance of stakeholder participation and recommend the establishment of a management team, steering committee, and advisory board. When we compare the situation in Slovak biosphere reserves with the UNESCO recommendations, three of four biosphere reserves do not reflect them or reflect them minimally. The most aligned is Poľana Biosphere Reserve. Here appears the question about the sustainability of the biosphere reserve because the declaration of participatory governance is also a subject of periodic evaluation of each 10 years and based on it the decision on the biosphere reserve designation is made. So if all biosphere reserves are preserved for the future, the implementation of participatory governance requires further development to fully align with UNESCO guidelines. By enhancing stakeholder engagement, dedicating resources, and learning from international best practices, Slovak biosphere reserves can better achieve their goals of sustainable development and conservation. They can learn how to develop the participatory governance in foreign biosphere reserves.

One of the inspired examples in management of biosphere reserves is the Entlebuch Biosphere Reserve. To implement the concept of biosphere reserve is guaranteed by the Biosphere Reserve Council as a supreme decision-making body. It comprises representatives from the 13 municipalities within the biosphere reserve, as well as representatives from cantonal authorities, relevant interest groups (agriculture, forestry, tourism, nature conservation, business, etc.), and scientific institutions. The Council sets the strategic direction for the biosphere reserve, approves the management plan, decides on important projects, and oversees the overall implementation of the biosphere reserve's goals. It acts as a platform for dialogue and consensus-building among the diverse stakeholders. The second body is an executive board as an operative steering body of the biosphere reserve. It is elected by the Biosphere Reserve Council and consists of a smaller group of representatives from key stakeholder groups and municipalities. The board is responsible for the day-to-day management and implementation of the Council's decisions. It prepares proposals for the Council, oversees projects, manages the budget, and represents the biosphere reserve externally. The management team of the biosphere reserve consists of 15 persons, they are responsible for the practical implementation of projects and programs defined by the Council and the executive board. The management team handles tasks such as project development and management, public relations, environmental education, coordination of activities, and administrative duties. The biosphere reserve organises for enhancing the stakeholder engagement the various forums, e. g. for education, for energy, wood, culture, culture, agriculture, tourism). It serves as a space for information exchange, discussion, and the generation of ideas related to the biosphere reserve's development. While it may not have direct decision-making power, it plays a crucial role in fostering local support and incorporating diverse perspectives (Entlebuch Biosphere Reserve, 2025).

Another example is a governance structure of the Vattenriket (Kristianstad Wetlands) Biosphere Reserve in Sweden. It doesn't have a strictly hierarchical structure, but it relies on a network of actors and collaborative bodies.

The municipality of Kristianstad plays a central role as the formal holder and main financier of the Biosphere Reserve. The political leadership within the municipality ultimately holds significant responsibility for the area's management and development in line with the biosphere reserve designation. The work of the biosphere office is led by a coordinator, who is the head of the Vattenriket biosphere office. comprises professional staff responsible for the day-to-day management, project implementation, communication, education, and coordination of activities within the biosphere reserve. They act as a facilitator and driving force for achieving the goals of Vattenriket. The Kristianstads Vattenrike Biosphere Reserve Consultative Group is an advisory group with around 30 members who represent various interests in the area, so it is a crucial element for stakeholder involvement. It includes local organizations, civil servants and politicians, as well as representatives of some regional and local authorities. The consultative group meets three times a year. Two meetings are held outdoors in the field to study the current problem on site. The advisory group does not have a formal decision-making position, but with its broad interest base it can make recommendations and suggestions that are taken up by various suitable actors. (Vaterrinket, 2025). Learning from international examples can provide valuable insights for enhancing participatory governance in Slovak biosphere reserves. These examples demonstrate effective stakeholder engagement through structured councils, advisory groups, and collaborative networks, ensuring the sustainable development and conservation goals of biosphere reserves.

Conclusions

Participatory governance is a fundamental principle in the management of biosphere reserves, emphasizing the active involvement of local communities, stakeholders, and institutions in decision-making processes. This approach fosters social capital, enhances decision-making processes, and ensures sustainable development. The composition and engagement of stakeholders vary based on the type of biosphere reserve and the legal framework of each country.

The aim of paper was to evaluate the application of participatory governance in Slovak biosphere reserves in comparison with the guidelines of UNESCO as well as theoretical framework and identify its weaknesses and strengths. The research results showed that the implementation of participatory governance in four Slovak biosphere reserves is essential for achieving sustainable development and effective conservation. The current governance structures vary significantly across them, with Poľana showing the most promise due to its active coordination council. However, there are notable weaknesses, such as limited dedicated staff and resources, and a lack of attention to biosphere reserve-specific governance in some areas. The three of four biosphere reserves do not develop fully the governance structure with the stakeholder's engagement. To address these issues, the paper provides inspiration based on the examples from the foreign biosphere reserves how to develop the stakeholder engagement through the establishment or revitalization of coordination councils and steering committees. It also suggests allocating specific personnel and a budget for biosphere reserve activities to reduce reliance on voluntary contributions.

Overall, the paper emphasizes the importance of aligning the governance structures of Slovak biosphere reserves with UNESCO guidelines to better achieve their goals of sustainable development and conservation. By implementing these recommendations, Slovak biosphere reserves can become more effective in managing their territories and fostering a harmonious relationship between humans and nature.

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