

THE MANAGEMENT OF BIOSPHERE RESERVES IN VIETNAM: OPPORTUNITIES AND CHALLENGES

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Abstract: Biosphere reserves (BR) are areas of terrestrial and coastal ecosystem which promote solutions that reconcile the conservation of biodiversity with its sustainable use. Biosphere reserves serve in some ways as "living laboratories" for testing and demonstrating integrated management of land, water and biodiversity. BR is internationally recognized within the framework of UNESCO's Man and Biosphere (MAB) Program. The MAB Program aims at solving one of the most important practical problems that people are facing today: how to strike a balance between biodiversity conservation, natural resources exploitation and socio-economic development that maintaining traditional cultural values to meet the increasing needs of people. It combines the natural and social sciences with a view to improving human livelihoods and safeguarding natural and ecosystems, thus promoting innovative approaches to economic development that are socially and culturally appropriate and environmentally sustainable. Vietnam currently has 11 BRs scattered across the length of the country and contains an important set of typical ecological, cultural and economic diversity of Vietnam. This article presents the current status of management of Vietnam's BRs, opportunities, challenges, and some recommendations on effective management of these areas.

Keywords: Biosphere reserve, sustainable development, biodiversity.

1. INTRODUCTION

Biosphere reserves (BRs) are learning sites for sustainable development. They are places for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including conflict prevention and biodiversity management [1]. They also provide local solutions to global challenges. BRs include terrestrial, marine and coastal ecosystems. Each site promotes solutions reconciling the conservation of biodiversity with its sustainable use. Man and Biosphere (MAB) Program was established in 1971 by the United Nations Educational, Scientific and Cultural Organization (UNESCO), with the concept of "Biosphere Reserve" was born five

years later. The goal of the MAB Program is to improve the relationship between people and their surrounding natural, and to provide a people-centred conservation approach that emphasizes the cost-benefit relationship between protecting the environment and using the environment [2]. MAB harmonizes the link between man and nature to achieve development goals which is implemented in areas recognized as BRs. Currently, the World Network of BRs (WNBR) includes 738 BRs in 134 countries. BRs perform three closely related functions, including: conservation (landscape, ecosystems, species and genetic resources), sustainable development (promoting sustainable economic development in all aspects) ecological, cultural and social), and support (promoting research, monitoring, education and training).

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important set of typical ecological, cultural and economic diversity of Vietnam. Vietnam's BRs are extremely diverse from the rugged beauty of the land and sea of the Cat Ba Islands, to the subtropical forests of the multi-ethnic regions of Nghe An in the north, or the dry forest ecosystem in Ninh Thuan or tropical evergreen forest ecosystems in the Central Highlands, then tropical moist rainforests and wetland ecosystems in Dong Nai and tropical mangroves in Can Gio or at the extreme southern peninsula of Vietnam - Ca Mau BR [3].

This paper presents the current status, opportunities, challenges, and some recommendations on management of Vietnam's BRs. The study results are considered to be fundamental information in supporting management of BRs in Vietnam. It also provides both a theoretical basis and a tool for implementing a multinational research

program on the interaction between humans and the biosphere.

2. DATA AND METHOD

2.1. Data

This study was conducted in 11 BRs of Vietnam. Data has been collected from State management agencies directly related to the BRs from central to local levels (Table 1).

2.2. Method

Interviews, surveys and literature reviews were used in this study. 120 questionnaires were collected from stakeholders related to the following research issues: (1) The current management mechanism of the BR; (2) The management effectiveness of the BR; (3) The participation of stakeholders in the BR.

SWOT analysis was used to identify relevant issues in the management of BRs in Vietnam.

Table 1: BRs Management Agencies

<i>Central level</i>	<i>Local level</i>
+Vietnam National Commission for UNESCO, Vietnam Man and Biosphere Program National Committee (MAB Vietnam) +Ministry of Natural Resources and Environment (MONRE) (General Department (Dept.) of Environment, Dept. of Nature Conservation and Biodiversity), Ministry of Agriculture and Rural Development (General Dept. of Forestry), Ministry of Science and Technology (MOST) (Dept. of Natural, Social and Human Sciences), Ministry of Culture, Sports and Tourism (Dept. of Cultural Heritage, Department of Tourism)	+ The People's Committee (PPC) of the province/city directly manages BRs or the PPC of districts and communes in the area of BRs. + Dept. of Natural Resources and Environment, Dept. of Agriculture and Rural Development, Dept. of Science and Technology, Dept. of Culture, Sports and Tourism, Department of Planning and Investment, Dept. of Education and Training, Dept. of Finance, Dept. of Foreign Affairs...
Other stakeholders include research, education agencies/organizations, NGOs; local communities, and private sectors.	

3. RESULTS AND DISCUSSION

3.1. Current status of management in BRs in Vietnam

In terms of organization structure, BRs usually have the following units: (i) Management Board; (ii) Secretariat; (iii) Advisory Council.

The Management Board is chaired by a leader of the Provincial/City People's Committee

(usually a Vice Chairman) and the remaining members are leaders of departments, districts and national parks/national reserves (NPs/NRs) (core areas). The BR Secretariat assists with the management and operation of the BR, while the Advisory Council plays a supporting role in the operation of the BR.

Functions and duties of the BR Management Board are usually clearly defined in the BR

Management Regulations as well as in the Management Board establishment decision. Based on the provisions of Vietnamese law and international conventions, the BR Management Board usually does not directly manage the territory, but coordinate activities with the active participation of the NRs and the residential community within the area of the BR. However, the members of the Management Board, in fact, depending on their functions and duties, manage the territory and carry out their specific responsibilities (Table 2)(Figure 2).

3.2. Opportunities and challenges in management of Vietnam’s Biosphere Reserves

The Biosphere Reserve management is an important tool for the implementation of the MAB program. The concept of Biosphere Reserve has proven its value beyond the boundaries of the main protected areas which are the core areas of the Biosphere Reserve, and is increasingly recognized by scientists, researchers, policy makers, businesses and local communities in bringing diverse knowledge, promoting scientific research and gaining experience to connect biodiversity conservation and socio-economic development serving the prosperity of mankind [4].

All Biosphere Reserves should ensure implementation of the UNESCO guidelines, first of which is the Seville Strategy and the Statutory Framework of the World Network of Biosphere Reserve (1996). In 2017, new guidelines were introduced, namely the MAB Strategy 2015 - 2025 and the Lima Action Plan 2016 - 2025 [5][6][7][8].

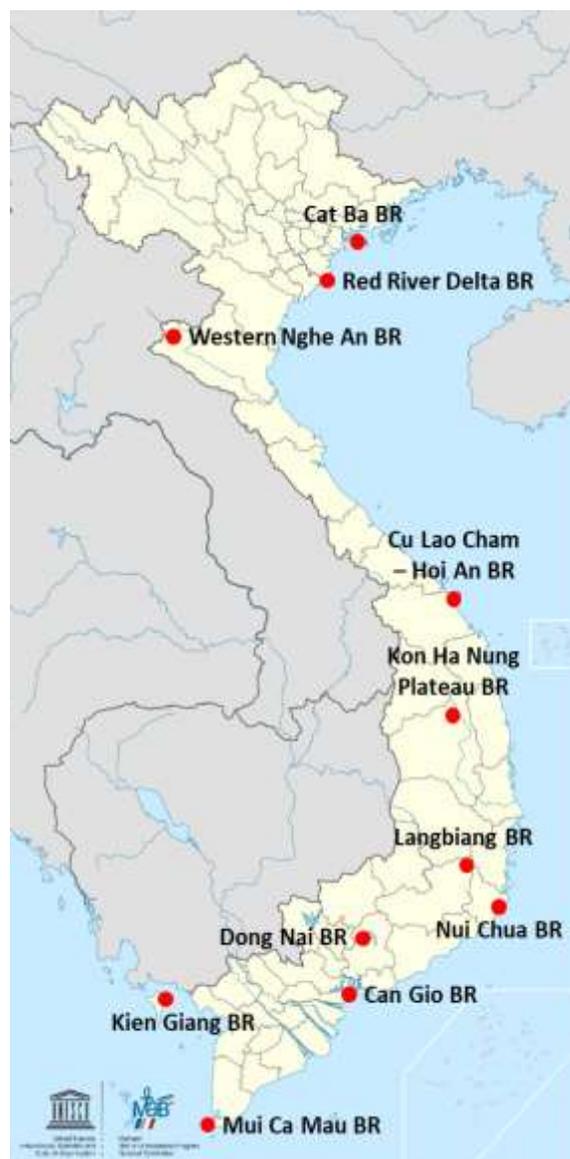


Figure 1: Network of Vietnam’s Biosphere Reserves
(Source: MAB Vietnam, 2022)

Table 2: Management status of BRs in Vietnam

No	Biosphere Reserve	Core Area(s)	Management/Standing Agency and BRMB	Management Regulation/Plan
1	Can Gio BR, Ho Chi Minh City <i>(established in 2000)</i>	Can Gio Protection Forest	Management agency: Dept. of Agriculture and Rural Development Standing agency: Can Gio	2008: The Regulation on Can Gio BR Management was issued 2020: Issued the Sustainable Development Strategy (2020 -

No	Biosphere Reserve	Core Area(s)	Management/Standing Agency and BRMB	Management Regulation/Plan
			Protection Forest MB 2000: The BR Management Board (BRMB) was established 2012: the BRMB has been strengthened	2030) and the BR Management Plan (2020 - 2025)
2	Dong Nai BR, Dong Nai Province (established in 2001)	Cat Tien National Park (NP), Dong Nai Culture and Nature Reserve (CNR)	Management agency: Dong Nai Province Standing agency: Dong Nai CNR 2012: Established Dong Nai BRMB 2008, 2020: Strengthened the BRMB	2015: Issued the Conservation and Sustainable Development Project (2015-2020) 2021: Issued the Sustainable Development Strategy (2021-2025) 2023: The Management Plan in processing
3	Cat Ba BR, Hai Phong City (established in 2004)	Cat Ba NP	Management agency: Hai Phong City Standing agency: Dept. of Agriculture and Rural Development 2005: Established the Cat Ba BRMB 2008, 2020: Strengthened the BRMB	2005: Issued the Regulations on management of Cat Ba BR 2018: Issued the Cat Ba BR Management Action Plan to implement the Lima Action Plan for the period of 2018 - 2025 2023: The Management Plan for the period of 2024 - 2028 in processing
4	Red River Delta BR, Nam Dinh, Thai Binh, Ninh Provinces (established in 2004)	Xuan Thuy NP, Thai Binh Wetland Nature Reserve (NR)	Nam Dinh Province (for the period of 2013-2015) 2013: The President of Vietnam National Commission for UNESCO issued the Decision No. 465/QD-UBQG UNESCO dated July 26, 2013 which established the Red River Delta BRMB, Advisory Council and Secretariat After the end of the term 2013-2015, the Red River Delta BR has not yet consolidated the MB	2013: "Regulation on coordination in management, conservation and sustainable development of the Red River Delta Inter-Provincial Coastal Wetland Biosphere Reserve " was promulgated together with Decision No. 466 of UNESCO
5	Kien Giang BR, Kien Giang	U Minh Thuong NP,	Management agency: Kien Giang Province	2014: Issued the Regulations on management of Kien Giang BR

No	Biosphere Reserve	Core Area(s)	Management/Standing Agency and BRMB	Management Regulation/Plan
	Province (established in 2006)	Phu Quoc NP (including Phu Quoc Marine Protected Area (MPA), Hon Chong NR and the mangrove belt of the West Coast	Standing agency: Dept. of Science and Technology 2010: Established the Kien Giang BRMB 2016: Strengthened the BRMB	
6	Western Nghe An BR, Nghe An Province (established in 2007)	Pu Mat NP, Pu Huong NR, Pu Hoat NR	Management agency: Nghe An Province Standing agency: Dept. of Agriculture and Rural Development 2013: Established the Cat Ba BRMB 2020: Strengthened the BRMB	2017: Issued the Strategy for the management of the Western World Biosphere Reserve in Nghe An (2017 - 2027)
7	Cu Lao Cham - Hoi An (CLC-HA) BR, Hoi An City (established in 2009)	Cu Lao Cham MPA	Management agency: Hoi An City 2013: Established the Cu Lao Cham - Hoi An BRMB 2016: Strengthened the BRMB	2015: Issued the Regulations on management of CLC-HA BR, Management Plan of the BR (2015 - 2019), Management Regulations and the Sustainable Development Project of the BR (2015-2030)
8	Ca Mau BR, Ca Mau Province (established in 2009)	U Minh Ha NP, Ca Mau NP, and the protection forest of the West Coast	Management agency: Ca Mau Province Standing agency: Dept. of Agriculture and Rural Development 2009: Established the Ca Mau BRMB 2015, 2020: Strengthened the BRMB	2009: Issued the Regulations on management of Ca Mau BR
9	Langbiang BR,	Bioup-Nui Ba	Management agency: Lam Dong	2018: Issued the Langbiang BR

No	Biosphere Reserve	Core Area(s)	Management/Standing Agency and BRMB	Management Regulation/Plan
	Lam Dong province (established in 2015)	NP	Province Standing agency: Bidoup-Nui Ba NP 2016: Established the Langbiang BRMB	Management Plan (2018 – 2022)
10	Nui Chua BR, Ninh Thuan province (established in 2021)	Nui Chua NP (including Nui Chua MPA)	Management agency: Ninh Thuan Province Standing agency: Nui Chua NP 2022: Established the Nui Chua BR Steering Committee	2022: Issued the Regulation on Management and Management plan of Nui Chua BR (2022-2026)
11	Kon Ha Nung BR, Gia Lai province (established in 2021)	Kon Ka Kinh NP, Kon Chu Rang NR	Management agency: Gia Lai Province Standing agency: Dept. of Agriculture and Rural Development 2022: Established the Kon Ha Nung BRMB	2022: Issued the Regulation on Management of Kon Ha Nung BR, and the Regulation on Operation and Task Assignment of Kon Ha Nung BRMB 2023: In the process of completing the Management Plan for the period of 2023 – 2030

3.3. Opportunities and challenges in management of Vietnam’s Biosphere Reserves

The Biosphere Reserve management is an important tool for the implementation of the MAB program. The concept of Biosphere Reserve has proven its value beyond the boundaries of the main protected areas which are the core areas of the Biosphere Reserve, and is increasingly recognized by scientists, researchers, policy makers, businesses and local communities in bringing diverse knowledge, promoting scientific research and gaining experience to connect biodiversity conservation and socio-economic development serving the prosperity of mankind [4]. The SWOT analysis of the Biosphere Reserves management status shows that the Vietnam’s

BRs has strengths, weaknesses, opportunities and common challenges that each Biosphere Reserve has to face to varying degrees [9][10].

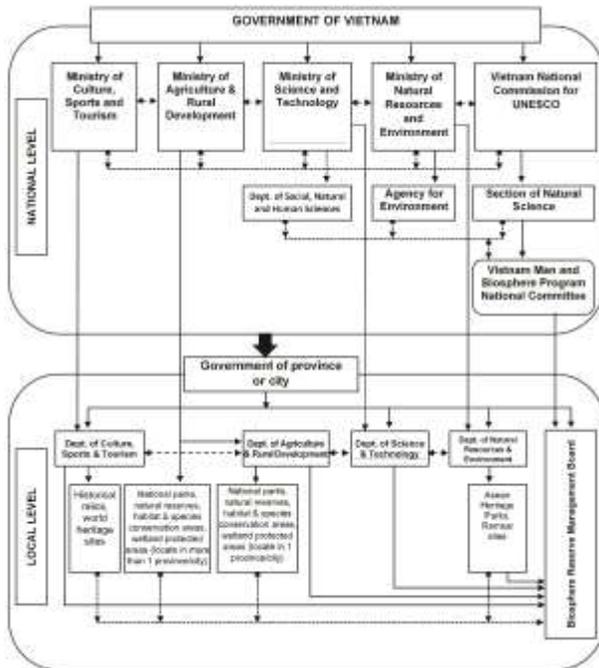


Figure 2: Diagram of governance organization of Vietnam BRs

(Source: MAB Vietnam, 2020)

Strength

The most important strength is the interest and support of central agencies such as the UNESCO Office in Vietnam, Vietnam National Commission for UNESCO, MAB Vietnam, MOST, MONRE. From 2000, these agencies have been supporting the BRs in variety perspectives as following: guiding the BR on developing the management structure, implementing activities; fostering national and international cooperation; implementing scientific researches and project; raising awareness and training staffs;

At the local level, the management mechanism with the Vice Chairman of the provincial/city PPC as the head of the MB helps promoting the viability of the BR, the inter-sectoral coordination mechanism is directed and promoted by the PPC, facilitating the management of the BR to be integrated in the local and sectoral plans and strategies.

All the BRs in Vietnam are managed under the multi-sectoral and inter-sectoral schemes, which brings a great support to the BRs.

Besides, local departments, agencies and sectors participate in the MB so that the activities of the BR are facilitated and focused.

Moreover, the core areas of the BR are the NPs/NRs that have well performed their functions and tasks in accordance with Vietnamese law, with a fairly synchronous system of institutions and policies on biodiversity protection, protection and conservation, forest development, protection and development of marine resources et cetera.

Lastly, awareness of the general public and communities living in and around the Biosphere Reserves is increasingly improved, local people agree and support the activities of the core areas and the Biosphere Reserve. According to periodic reviews of some BRs, the awareness of local people and related stakeholders about the BR is much higher in the recent years thanks to variety activities of BRMBs and core areas' MBs.

Weakness

In general, there are weaknesses of Vietnam BRs, including: The PPC of the province/city has to take on a large amount of work, so the requirements of the Biosphere Reserve are sometimes neglected or there is no individual in charge of the overall responsibility; the development and implementation of the mechanism for coordination, cooperation and information sharing among stakeholders in the BR is still lacking and ineffectively implemented. Currently, 10 BRs are under management of province or city PPC, only Can Gio BR is under Dept. of Agriculture and Rural Development of Ho Chi Minh City. This mechanism proves the most effectiveness for the BR model, therefore, the solution might be raising the awareness of related stakeholders and foster the cooperation mechanism.

The Biosphere Reserve is under the administrative management of many districts or provinces with large area and population, leading to difficulties in coordination and implementation of activities, especially for inter-

provincial Biosphere Reserves. With aspect of human sources, most of the staff work part-time, and expertise in a single sector (forestry, biology, communication, tourism, et cetera), lack of interdisciplinary knowledge and experience in multi-sectoral coordination, lack of skills in management planning as well as monitoring, and integrating the BR management plan into the local socio-economic development policy making system. The regular budget for the activities of the Management Board is limited, there is a lack of funds for capacity building, especially the management capacity and updating information, new knowledge and learning foreign languages for staff.

Opportunity

The new orientation of UNESCO/MAB in promoting the viability and role of Biosphere Reserves globally. The Biosphere Reserve can be used as a framework to guide and attract projects and funding sources. Moreover, UNESCO's recognition as a Biosphere Reserve can raise awareness of local people, citizens and government officials on environmental and development issues. Biosphere Reserves also have the opportunity to demonstrate their role as laboratories for sustainable development solutions in the context of increasing global challenges, as a tool for countries and localities to implement the Agenda for Sustainable Development, the Convention on Biological Diversity, the Sustainable Development Goals, or the Decade for Sustainable Development Education.

Challenge

In the recent years, many researches have been implemented in the Vietnam BRs. However most of them focus on forest protection and development, biodiversity conservation and tourist, only a few prioritizes the issues such as community livelihood, gender, climate change mitigation and adaptation, etc. Moreover, almost no research set the BR as the target research place, the main research sites were just the protected areas which were known as the core areas of one

BR, therefore there is a lack of research results in the buffer zone and transition area except the social - economic database monitored by Vietnamese central and local government.

The Biosphere Reserve is a tool for integrated management of ecological, social and cultural systems, so managers need to implement a variety of interventions at different levels, and at the same time with specific goals. Managers need to have a long-term vision on maintaining the management of the Biosphere Reserve, not just submit the initial nomination. Therefore, it is necessary to take into account the management mechanism, financial resources and management plan at the beginning of the initiative to designate the Biosphere Reserve.

Another challenge is the lack of institutional regulation. The knowledge level research institutions in Vietnam about the Biosphere Reserve may fall into one of the following cases: (1) Not knowing about the MAB Program and the Biosphere Reserve and just coincidentally doing research in the area of the Biosphere Reserve; (2) Knowing about the MAB Program and the network of Biosphere Reserves but not really making use and using it actively in their research; (3) Knowing about the MAB Program and the Biosphere Reserve network and actively use it in their research. Thus, the challenge here is to really engage the active participation of researchers and research institutions in a wide and comprehensive way by increasing the level of awareness and expression of the values of the MAB Program and BR network. To do so, the Biosphere Reserves themselves and related agencies such as UNESCO, the National Committee for UNESCO and the MAB Program need to be more active in the need to improve their capacity, promote their image, and promote cooperation, etc.

3.4. Recommendations on management of Vietnam's Biosphere Reserves

For central authorities

+ To promulgate a document guiding the Biosphere Reserves in implementing the

provisions of the Law on Environmental Protection 2020 and Decree 08/2022/ND-CP;

+ To promulgate more specific regulations on the allocation of state budget for the operation of the Biosphere Reserve;

+ To develop long-term operational strategy and vision for the entire Network of Biosphere Reserves of Vietnam.

For the Biosphere Reserves in Vietnam

+ To actively promote the activities of the Biosphere Reserve through: strengthening the structure and personnel of the Biosphere Reserve; closely coordinating with stakeholders, especially the Management Boards of the core areas in implementing and integrating the activities of the Biosphere Reserve into the core areas' activities and research agencies in conducting research that is appropriate to the needs and the practice of the Biosphere Reserve as well as the application of research results in the operation of the Biosphere Reserve;

+ To actively participate in and respond to activities of the MAB Program, the national and international network of Biosphere Reserves: participate in the international events such as UNESCO General Assembly Annual Meeting, MAB ICC Annual Meeting, Thematic and Regional Network conferences...

+ To promote domestic and international cooperation through organizing exchange and learning delegations between national and international BRs; signed a Memorandum of Understanding to promote cooperation and share experiences; sister Biosphere Reserve; join Thematic Network (WNICBR, WNMBR)...

+ To participate in thematic networks of Biosphere Reserves, including the Network of Biosphere Reserves in the coastal and island areas and the Network of the Mountain Biosphere Reserves.

+ To improve staff qualifications in professional fields in general and biosphere in particular, focusing on English language proficiency

+ To focus on the role of youth in the new context and building an open mechanism for the participation of MAB Youth in the Vietnam BR Network and in the activities of each Biosphere Reserve.

+ To enhance the role and voice of the community, preserving indigenous culture and knowledge, involving the community in the activities of the Biosphere Reserve;

+ To develop Biosphere Reserve eco-labels for, attract the participation of the private sector, prioritize eco-tourism, community-based tourism and other sustainable development models.

+ To prioritize environmental education activities in the direction of Education for Sustainable Development (ESD) of UNESCO, integrating experiential activities, career guidance according to the regulations of the Ministry of Education and Training in the Biosphere Reserves.

+ To link and focus on coordination with researchers, national and international research organizations to promote scientific research in, with and for the Biosphere Reserve.

+ To synthesize data to build the basic database of the Biosphere Reserve and contribute to the database of the Vietnam Biosphere Reserve Network.

4. CONCLUSION

Biosphere Reserves in Vietnam contain extremely diverse types of ecosystems which leads to differences in natural resources as well as stakeholder, institutional and management structures of each BR. Finding a common model for all Biosphere Reserves may be impossible and sometimes detrimental, therefore, management guidelines should provide a common framework to facilitate Biosphere Reserves in flexible operating within the allowable framework, ensuring its suitability, feasibility and effectiveness. Moreover, the most important priority is empowering indigenous peoples and local communities. The diversity of management and governance approaches demonstrates the value of the BRs themselves

and should be promoted

Some pictures of BRs in Vietnam



*Mangrove ecosystems at Can Gio BR
(Source: Can Gio Protection Forest MB)*



*Traditional dancing of ethnic people at
Dong Nai BR (Source: Dong Nai BRMB)*



*Migratory bird at Red River Delta BR
(Source: Xuan Thuy National Park)*



*Tay Nguyen Gongs performance at Langbiang
BR (Source: Bidoup-Nui Ba NP)*

REFERENCE

- [1] Biosphere reserves: the Seville Strategy and the statutory framework of the world network, 1996.
- [2] Pool-Stanvliet R, Coetzer K., 2020. The scientific value of UNESCO biosphere reserves. S Afr J Sci.2020;116(1/2), Art. #7432, 4 pages. <https://doi.org/10.17159/sajs.2020/7432>.
- [3] Vu Thuc Hien, Le Hanh Chi, 2022. Science and research in, with and for UNESCO-recognized biosphere reserves. Proceedings of Workshop "Basic science for sustainable development - Sharing experiences of Vietnam's biosphere reserves and global geopark". Vietnam Academy of Forestry Science, August 11, 2022: page 2-26.
- [4] Man and the Biosphere Programme: biennial activity report 2016-2017
- [5] UNESCO, 1996. Biosphere reserves: The Seville Strategy and the Statutory Framework of the World Network. UNESCO, Paris.
- [6] UNESCO, 2008. Madrid Action Plan for Biosphere Reserves (2008-2013). UNESCO, Madrid.
- [7] UNESCO, 2015. MAB Strategy 2015-2025.
- [8] UNESCO, 2016. Lima Action Plan for UNESCO's Man and the Biosphere (MAB) Programme and its World Network of Biosphere Reserves (2016-2025). UNESCO, Lima.
- [9] UNESCO, 2021. Technical Guideline for Biosphere Reserve.

- [10] Rebecca Laibich, and Alicia Donnellan Baraclough, 2022. It's about life. Research Conference "Science and Research in, for and with UNESCO Biosphere Reserves. German, 15-20/5/2022.