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Sustainable Natural Resource Management Project (SNRM)

FIVE-YEAR MANAGEMENT PLAN FOR LANGBIANG WORLD BIOSPHERE RESERVE

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ABBREVIATIONS

CC	Climate change
MB	Management Board
CBD	Convention on Biological Diversity
CM	Cooperation management
ET	Ecotourism
BR	Biosphere Reserve
WBR	World Biosphere Reserve
BD	Biodiversity
EE	Environmental education
ES	Ecosystem
JICA	Japan International Cooperation Agency
SE	Socio-economic
S & T	Science & Technology
LBWBR - MB	Langbiang World Biosphere Reserve Management Board
MAB	Man and Biosphere Reserve Programme
MAB - UNESCO	UNESCO Man and Biosphere Reserve Programme
METT	Management Effectiveness Tracking Tool
SB	State budget
ODA	Official Development Assistance
SD	Sustainable development
SNRM	Sustainable natural resource management project
NR&E	Natural Resource & Environment
NR	Natural Resource
PC	People's Committee
NC	National Committee
MAB NC	MAB National Committee
UNESCO	United Nations Educational Scientific and Cultural Organization
NP	National Park
WNBR	World Network of Biosphere Reserves
WWF	World Wildlife Fund

1 BACKGROUND

1.1 Introduction

Langbiang Plateau and its vicinity was recognized as the Langbiang Biosphere Reserve (LBWR) on June 09 2015 by the United Nations Organization for Education, Science and Culture (UNESCO, 2015). This is the 9th World Biosphere Reserve (BR) of Vietnam. The main purpose of Biosphere Reserve establishment is promote collaboration, learning to maintain healthy ecosystems and ensure human well being and advanced economic development (Heinrup and Schultz, 2017).. This is also consistent with the overall goal of the "National Action Plan for implementation of 2030 Agenda for sustainable development" of Vietnam to "Maintaining sustainable growth in parallel with ecological environmental protection, management and efficient use of natural resources, actively respond to climate change; ensuring that everyone's potential to be promoted, participation and enjoyment of development achievements; towards building a peaceful, prosperous, inclusive, democratic, fair, civilised and sustainable society" (VPPTBV, 2016). Therefore, the world Biosphere Reserve sites need be managed and coordinated in order to become a place of learning and a sustainable development model, contributing to implementation of Agenda 2030 for Vietnam sustainable development (GIZ, 2016).

LBWR covers an area of 276.440 hectares, located in six districts and city of Lam Dong province, including Lac Duong, Lam Ha, Dam Rong, Don Duong, Duc Trong and Dalat city. The core values of LBWR have been recognized by UNESCO: a region rich in ecosystems representing a specific biological geographic area; a significant area for biodiversity and cultural preservation; This area can carry out sustainable development, fulfilling the three functions of a biosphere reserve that is conservation, support and development. As such, LBWR has been affirmed as a global landscape, which is also the basis for Lam Dong Province to participate in the development and implementation of the 2030 Agenda for Sustainable Development in Vietnam.

However, maintaining and protecting the core values of LBWR for sustainable development is still difficult and greatly challenging. There are external difficulties and challenges such as the adverse effects of globalization, economic crisis, conflict and climate change, epidemics, and so on. Other internal difficulties such as the development of the East-West Economic Corridor, the rapid urbanization process in recent years, the increase in the natural and mechanical population increases, the demand for natural resources or lack of financing for conservation activities ... has had a negative impact on the integrity of ecosystems. The difficulties mentioned above affect not only LBWR but also the institutional and management plans of many different departments at different levels.

With the motto "Conservation for development, development for conservation" and the multi-sectoral coordination mechanism of the Lam Dong Province People's Committee and representative of the Langbiang Biosphere Reserve Management Board (LBWR-MB) formulating an official management plan to protect, maintain and promote the values of the biosphere reserve for local socio-economic development is essential.

With the sponsor from the JICA, the Institute for Highland Scientific Research in partnership with Center for Environmental Research & Education (CERE), Hanoi National University of Education and LBWBR-MB has developed the five (5) years Management Plan for LBWBR. The SLIQ (system thinking, landscape planning, intersectoral coordination, and quality economy) approach was fully referred as guidelines for sustainable management and operations of the biosphere reserve in making the management plan. The management plan has been repeatedly reviewed, deliberated, and edited through consultations with involvement of many scientists, managers and Advice Council of LBWBR and Japanese experts.

The final management plan will be submitted by LBWBR MB to Lam Dong Province PC for approval and then implementation.

1.2 Need statement

(1) At the request of UNESCO in the World Biosphere Reserves nomination, all BR need to have their Management Plan and it must be accompanied with local social-economic development planning and land use planning as well as the program development and Plans in other sectors. Management plan also needs to inherit and support for existing management plans of core zones (national parks/protected area) (UNESCO, 2013a).

(2) LBWBR was recognized by UNESCO in June 2015 and therefore has not been mentioned in national and provincial socio-economic development policies (Decision No. 1462 / QD-TTg) of the Prime Minister approving the master plan for socio-economic development of Lam Dong province up to 2020 (Prime Minister, 2011); Decision No. 1119 / QD-UBND of Lam Dong Province People's Committee on approval of the action plan to implement the sustainable development strategy of Vietnam in 2011-2020 period in Lam Dong province (Lam Dong PC, 2013), Decision No. 704 / QD-TTg by the Prime Minister approving the adjustment of general planning of Da Lat city and its vicinity to 2030 and vision to 2050 (Prime Minister, 2014), Resolution No. 19 / 2016 / NQ-Lam Dong People's Council on Lam Dong 2016-2020 medium-term public investment plan (People's Council , 2016). This means that LBWBR activities are not covered by the direct investment budget for the period 2016-2020 unless a management plan is approved by the competent authorities and added to the overall development plan.

(3) In the medium-term public investment plan for Lam Dong 2016-2020, there are investment programs and projects in LBWBR implemented by different organizations and departments of different levels. In order to meet the goals of socio-economic development and sustainable development with multi-sector and multi-sectoral coordination mechanism, the effective implementation as well as the integration of approved programs and projects into the management objectives for LBWBR is very necessary.

Therefore, a 5-year management plan for LBWBR is necessary to identify the priority activities and mobilize resources effectively and maximize the effectiveness of cooperation between stakeholders, thereby contributing to the socio-economic development of local and capacity building to cope with climate change. And, LBWBR would be a learning model for sustainable development. This also contributes to the realization of the goals of Vietnam

Agenda 2030 (Goal 3, 8, 11, 15, 17) and the master plan on social-economic development of Lam Dong Province until 2020.

1.3 Scope of the Management Plan

The management plan targets the whole area of LBWBR, which covers a total of 2,764 km² and geographically overlaps with five (5) districts or 35 communes in the Lam Dong province. The objectives and action plan of the management plan are set and developed on the premise that the management plan will be implemented for the next 5 years (2018-2022).

The management plan comprises a total of nine (9) chapters. After introduction of the background of the management plan in Chapter 1, the following chapter, Chapter 2, explains the methodologies employed for development of the management plan. Chapter 3 rationalizes the necessity of the management plan, while Chapter 4 describes the present conditions of LBWBR. Major issues to be addressed in the management of LBWBR are described in Chapter 5. Chapter 6 explains the vision, objectives, and strategies of the management plan, and the action plan which consists of nine (9) programs (or 35 sub-programs) with the proposed institutional framework for implementation are detailed in Chapter 7. Chapter 8 shows the indicative budget estimates for the sub-programs that have not been incorporated into the existing master plans of the relevant sectors. The last chapter, Chapter 9, describes the monitoring and evaluation activities to be carried out by LBWBR-MB in collaboration with the relevant departments/agencies in the Lam Dong province.

2 METHODOLOGIES FOR DEVELOPMENT OF THE MANAGEMENT PLAN

2.1 Basic concepts

2.1.1 Development of a Multisectoral Collaboration Plan

One of the characteristics of LBWBR to be addressed in the preparation of its management plan is its scale and diversity as it contains the whole area of the national park (Bidoup Nui Ba National Park) and the urbanized area in the province (Dalat City and Duc Trong district). In order to develop a sustainable development model for the whole area of LBWBR, the management plan should be an integrated plan which consists of a wide range of approaches and actions to be implemented under a multisectoral collaborative framework. Hence, all the relevant departments and local government offices concerned and key stakeholders involved in implementation take part in the process of making the management plan.

2.1.2 Consistency with the Existing Strategies and Plans

When the preparation of this management plan started, which was in the middle of 2016, all the relevant provincial master plans (e.g., socio-economic development plan, forest protection and development plan, biodiversity conservation plan, and sustainable development strategies) were already in place. It might not necessarily be easy for the relevant departments to secure budgets necessary for implementing programs/sub-programs proposed in the management plan if the management plan was developed without considering the existing master plans.

It is, therefore, essential to identify and re-align projects/activities programmed in the existing socio-economic and master plans in the relevant sectors for the preparation of the management plan so that the management plan could be accepted by the relevant departments and, most importantly, implemented within the framework of the on-going socio-economic development plan as well as relevant strategies and master plans of the key sectors in the province.

2.1.3 Integration of Activities for Operation of the Biosphere Reserve and Field Trials being implemented in the Field

In addition to the existing projects/activities relating to management of the biosphere reserve, it is necessary to incorporate the following activities, which are not currently programmed in the existing plans, into the management plan.

- a. Activities necessary for management and operations of LBWBR-MB, such as planning, monitoring and evaluation, and capacity building
- b. Activities for continuation and promotion of the field trials currently being carried out/demonstrated by the JICA-supported project named Sustainable Natural Resource Management Project (SNRMP)
- c. Activities not programmed in the existing plans but needed for improvement of the management of the biosphere reserve, such as public awareness raising of LBWBR and environmental education

Particularly, due consideration should be given to those related to the field trials made by SNRMP, namely i) development (or upgrading) of the collaborative management model, ii) development of sustainable livelihood improvement options, and iii) development of community-based eco-tourism models and environmental education programs, as they should be widely applied and eventually institutionalized as systems/tools for sustainable management of forest ecosystems in the biosphere reserve.

2.2 Process of making the management Plan

The management plan has been developed by following the procedures described.

- (1) Consultations with representatives from the relevant stakeholders (e.g., government offices, district PCs, commune PCs, and private sector)
- (2) Collection and review of the existing policies, legislative documents, strategies, and plans relevant to management of the biosphere reserve
- (3) Review of the on-going activities (field trials) including those done with technical assistance from SNRMP
- (4) Identification of programs/sub-programs of the management plan
- (5) Examination of an institutional framework for implementation of the management plan along with roles and responsibilities of key stakeholders involved in the implementation

- (6) Estimation of budgets necessary for implementation of specific programs/sub-programs
- (7) Development of an implementation plan for the management plan
- (8) Development of a monitoring and evaluation plan
- (9) Consultation with the relevant government offices about the draft management plan
- (10) Submission of the management plan to the LBWBR conference
- (11) Revision of the management plan
- (12) Submission of the management plan to specialized departments for evaluation
- (13) Submission of the management plan to Lam Dong PC for approval

2.3 Methodologies

2.3.1 Data Collection

A number of data, such as existing laws, decrees, policies, strategies, and master plans, were collected and reviewed for making the management plan (Appendix 2 shows the data and information collected and reviewed in the process).

2.3.2 Assessment of the Current Situations

In addition to the desk studies on the current situations of the biosphere reserve, a situation analysis, especially a SWOT analysis, was made in a participatory manner through a one-day workshop, which was held with the relevant stakeholders, such as representatives from the departments and district PCs concerned and private sector in Lam Dong province, in December 2016.

2.3.3 Assessment of Programs/Projects/Activities of the Management Plan

Through reviews and assessments of the existing strategies and master plans in the relevant sectors, existing programs/projects related to sustainable management of LBWBR were identified as potential interventions for management of the biosphere reserve. The potential interventions were further evaluated in terms of the following aspects and select the ones considered the most effective in achieving the goal and objectives of the management plan as the proposed programs/sub-programs of the management plan.

- Contribution to conservation of values and functions of ecosystems in the LBWBR especially its core zone;
- Contribution to establishment of a sustainable livelihood development model (a model to improve local livelihoods without degradation of environment);
- Promotion of environmental education and research for conservation of biodiversity of the biosphere reserve;
- Contribution to establishment of an institutional framework or systems for sustainable use and management of LBWBR; and

- Promotion of sharing benefits and environmental services generated by ecosystems with local people living in the biosphere reserve.
- The same criteria were used for selection of the sub-programs/activities relevant to management and operations of LBWBR after long-listing the potential activities of the management board.

2.3.4 Cost Estimates of the Management Plan

Costs of programs/sub-programs newly proposed in the management plan were roughly estimated in the plan. Those already planned in the existing master plans in the relevant sectors were not estimated in the plan to avoid the duplication of budget allocation.

3 JUSTIFICATION OF THE MANAGEMENT PLAN

3.1 Current national policies and strategies on biosphere reserve management

3.1.1 Lima Action Plan on biosphere reserves for 2016-2025

Lima Action Plan for biosphere reserves 2015-2025: Towards a world where everyone is aware of their common future and interaction with our planet, and helping hands and responsibilities in building a sustainable society in harmony with the biosphere.

The Lima Action Plan consists of four main tasks: i) development and consolidation of sustainable development models within the World Network of Biosphere Reserves (WNBR); ii) Communicate the experiences and lessons learned that facilitate the dissemination and global application of these models; iii) support for quality assessment and management, sustainable development strategies and policies, and planning; iv) help members and stakeholders meet the SDGs through experience from the BR system, especially the discovery and testing of policy, technology and innovated sustainable management of biodiversity and natural resources and mitigation, adaptation to climate change.

To achieve these four tasks, biosphere reserves need to focus on five areas of strategic action and the outputs need to be achieved:

(1) The biosphere reserve network includes functional models for sustainable development with key results to be achieved. (i) Biosphere Reserves have measurable contributions to national development goals, supporting actively the implementation of multilateral environmental treaties, benefiting the biodiversity conservation and indigenous communities, maintaining and developing the ecological and social systems in the biosphere reserve. Forming operational guidelines that integrate local, national and regional action plans as well as financial resources for these activities; (ii) Strengthen cooperation in environmental education in human resource training, scientific research, business planning and sustainable financing for biosphere reserves.

(2) Extend the synergy, dynamism and effectiveness collaborative network within the Man and Biosphere Program and within the biosphere reserve network with the main results to be achieved: (i) Formulate and implement global curricula and capacity building programs,

including academic courses; (ii) foster the involvement of stakeholders, especially biosphere research scientists and information-sharing in research.

(3) Effectively cooperate with external partners and seek sustainable and adequate funding for the Human and Biosphere Program and within the biosphere reserve network with key results to be achieved: (i) Develop and implement a business and marketing plan for the biosphere reserve in collaboration with the private sector, (ii) Construct a biosphere reserve label combining existing national policies, branded labels for goods and services of biosphere reserve;

(4) Comprehensive, open, and transparent communication and information sharing with the key results achieved is the development and implementation of communication strategies and plans for the biosphere reserves;

(5) Effective governance in the Man and Biosphere Program and within the biosphere reserve network, with the main outcomes to be achieved, are the establishment of biosphere management systems with interdisciplinary nature ensuring resource integrity. Key to the operation of the management system, the establishment of the reporting system, monitoring activities

Thus, in order to meet the aim of effective management of biosphere reserves, the sites need to develop a plan in line with the references required for the objectives of the Lima Action Plan, appropriate and feasible in Vietnam conditions. Therefore, the elaboration of a concrete plan for Langbiang is necessary to meet that need.

3.1.2 Vietnam Man and Biosphere Program National Committee

Establishment decision

The Vietnam Man and Biosphere Program National Committee (MAB Vietnam) is an organization under the Natural Sciences Sub-Committee of the Vietnam National Commission for UNESCO, operating under Decision 03/BTK/07, dated January 18, 2007 by the President of the Vietnam National Commission for UNESCO.

Roles and responsibilities

1. To act as a national focal point for managing and conducting research activities on biosphere related issues within the framework of scientific research activities of the Human and Biosphere Program of the Organization for Education, Science and Culture of the United Nations (MAB/UNESCO), in accordance with MAB/UNESCO regulations.
2. To carry out the tasks and activities assigned by the National Commission for UNESCO.
3. To study and submit to the higher authorities (Government, Viet Nam National Commission for UNESCO, Ministry of Science and Technology, MONRE) issues on Vietnam's direction, policies, programs and plans involved in the human and biosphere of MAB/UNESCO.

4. Annual reports of UNESCO Vietnam and MAB/UNESCO on the organization and operation of MAB VN.
5. Support the localities in preparing the Biosphere Reserve nomination file submitted to the MAB/UNESCO Secretariat.
6. Keep in touch with the UNESCO Natural Sciences Sub-Committee to promote cooperation programs between Vietnam and UNESCO in the field of natural sciences in general and the biosphere in particular.
7. Maintain contact and cooperation with other Subcommittees of the National Commission for UNESCO.
8. Co-ordinate with related agencies in MAB / UNESCO to implement Vietnam's tasks and powers in MAB/UNESCO.
9. Inform MAB/UNESCO activities to relevant agencies and organizations in the country.
10. Regularly transact with international and regional MABs / UNESCOs to coordinate and link world organizations and scientists to enhance cooperation, exchange of knowledge and experience within the framework of their activities.

Organizational structure

Include 01 chairman, no more than 03 vice chairmen, 01 secretariat. The Standing Committee of MAB VN is composed of the chairman, the vice chairmen and the secretariat.

Main activities

- Nominating nine biosphere reserves including Can Gio, Dong Nai, Red River Delta, Cat Ba, Kien Giang, Tay Nghe An, Cu Lao Cham - Hoi An, Ca Mau, Langbiang.
- Chairing and participating in domestic projects, programs and projects and international cooperation

Resources to implement the activities

- State budget
- Support of international and scientific research projects

MAB Vietnam's long-term objective:

Vision: Harmony between people and nature in the process of sustainable development of the country

Mission: Use biosphere reserves as "learning laboratories" to apply diverse ideas and approaches in conservation and development to meet the needs of people in order to be sustainable in economic, ecological and cultural aspects.

3.1.3 National Biodiversity Strategy to 2020, vision toward 2030

The National Biodiversity Strategy to 2020, vision toward 2030 was developed to fulfil the international commitments of the GoV under the Convention on Biological Diversity (CBD) and identify goals, objectives, and tasks for the conservation and sustainable use of

biodiversity in the country for the period between 2010 and 2020. The main objective of the National Biodiversity Strategy is to preserve and sustainably use the important ecosystems, endangered, rare, and precious species, and genetic resources to contribute to the development of the green economy and to actively respond to climate changes by 2020. Toward this end, the strategy specifically aims: i) to improve the quality and increase the area of protected ecosystems, ii) to improve the quality and populations of endangered and endemic species, and iii) to make an inventory and store as well as conserve native, endangered, rare and precious genetic resources.

Hence, the proper management of the biosphere reserve, especially the management of the core zone, will significantly contribute to the achievement of the targets set by the National Biodiversity Strategy.

3.1.4 National Forest Protection and Development Plan

The National Forest Protection and Development Plan was developed and issued as Prime Minister Decision (No 57/QĐ-TTg) on January 9, 2012 to orient all the relevant stakeholders in the forest sector toward the following objectives:

- ◆ To effectively manage forest and land resources available for forestry in an effective and sustainable manner;
- ◆ To increase the forest cover to 42-43% by 2015 and 44-45% by 2020, respectively; increase the productivity, quality, and values of forests; restructure the sector towards increasing forestry values; and meet basic demands for timber and forest products for domestic consumption and export;
- ◆ To generate more job opportunities; improve income structure of forest-dependent households; contribute to hunger elimination and poverty reduction; and ensure national security and defense.

Likewise, the proper management of forests in core and buffer zones of the biosphere reserve which includes protection, rehabilitation and restoration of forests will be consistent with the national forest protection and development plan.

3.2 Provincial strategies, and master plans relevant to management of the biosphere reserves

3.2.1 Socio-Economic Development Master Plan of Lam Dong Province (2011-2020) (PM Decision No. 1462/QĐ-TTg)

The socio-economic development master plan between 2011 and 2020 of Lam Dong Province was approved by PM Decision (PM Decision No. 1462/QĐ-TTg) on August 23, 2011. The main objectives of the master plan are: i) to make the Lam Dong province fairly developed in the central highland region with the development of service industries and introduction of modern infrastructure, ii) to develop the education and training systems for human resource development, iii) to improve the cultural and living conditions of all ethnic minorities, and iv) to maintain national defense and security.

As the master plan gives all the sectors in the province the development directions and orientations toward the achievement of the objectives and specific targets of the master plan, the socio-economic development master plan is fully referred in the development of the master plans/action plans of the sectors and departments.

3.2.2 Biodiversity Conservation Master Plan of Lam Dong Province until 2020 and Vision to 2030 (Decision No. 169/QD-UBND dated 23th January 2017)

The biodiversity conservation master plan was approved by the Lam Dong PPC (PPC Decision No. 169/QD-UBND) with an aim to i) conserve and sustainably develop important ecosystems, endangered species, precious and rare species, and genetic resources in the province and ii) maintain and develop ecosystem services in response to climate changes. The master plan proposes the following six priority programs, which comprise 30 projects.

- a. Increase of public awareness of biodiversity conservation
- b. Enhancement of management capacity for biodiversity conservation
- c. Detailed planning and establishment of protected areas
- d. Construction of conservation facilities
- e. Enhancement of community participation in conservation
- f. Implementation of relevant integrated projects

3.2.3 Action Plan for Implementation of the Sustainable Development Strategy of Vietnam between 2011 and 2020 in Lam Dong Province (Decision No. 1119/QD-UBND dated 10 June 2013)

The action plan for implementation of the sustainable development strategy of Vietnam, which was approved by the Lam Dong PPC (PPC Decision No. 1119/QD-UBND), aims to identify the process, major programs, and tasks given to the relevant organizations for implementation of the Sustainable Development Strategy of Vietnam (2011-2020) approved by PM Decision (PM Decision No. 432/OD-TTg). A total of 12 targets comprising 108 projects are proposed in the action plan. Sustainable environmental development, nature conservation, and green growth are the key targets of the action plan; therefore, it has high compatibility with the management plan of LBWBR.

3.2.4 Forest Protection and Development Plan in Lam Dong Province (Decision No. 18/QD-UBND)

The provincial forest protection and development plan was approved by the Lam Dong PPC (PPC Decision No. 18/QD-UBND) on January 5, 2013 to promote forest protection, development and sustainable use of forests in the province in accordance with the National Forest Protection and Development Plan (PM Decision No. 57/QD-TTg). The goals of the plan are: i) to manage and sustainably use the existing forests in three (3) types of forest land, ii) to ensure the participation of economic sectors and local communities in forest protection and development, and iii) to protect the water sources, ecosystems, and biodiversity to maintain the forest ecosystem services. As protection and restoration of forests in the province are key activities of the plan, the plan can be synchronized with the management plan of LBWBR.

3.2.5 Implementation Plan of the National Environmental Protection Strategy of Vietnam until 2020 and Vision to 2030 in Lam Dong Province (Decision No. 2527/QD-UBND dated 20 Nov.2014)

The implementation plan of the National Environmental Protection Strategy was approved by the PPC (PPC Decision No. 2527/QD-UBND) in 2014 to protect the environment in Lam Dong province in line with the National Environmental Protection Strategy. The implementation plan is composed of 11 components: i) prevention and control of causes of pollution, ii) control, treatment, and reduction of pollution sources, iii) improvement and mitigation of pollution, iv) construction of environmental infrastructure, v) effective and sustainable use of natural resources, vi) biodiversity conservation, vii) improvement of action to climate change and reduction of GHG, viii) promotion of awareness raising, ix) development and reinforcement of legal and policy frameworks, x) development and application of high technologies and science researches, xi) development of environmental economy, xii) diversification of investments, and xiii) international cooperation.

Because of the nature of the plan, priority programs and projects, especially those relating to sustainable natural resource management, biodiversity conservation, and pollution control, are relevant to the management plan of LBWBR.

3.3 Current legal framework in biosphere reserve management

3.3.1 General

The UNESCO Man and Biosphere Program requires biosphere reserve sites to develop and establish management structures to mobilize the participation of a range of stakeholders, including local authorities, communities and the private sector to design and implement the functions of the Biosphere Reserve (criterion 6) and to adopt a management and conservation management mechanism approved by UNESCO, including: (a) mechanism for management of human exploitation activities in the buffer zone; (b) a policy or management plan for the entire biosphere reserve; (c) Have a mechanism or management team established to implement that policy or plan; (d) have research, monitoring, education and training programs (seventh criterion).

These criteria also serve as a basis for MAB-UNESCO to assess the management effectiveness of a recognized biosphere reserve and decide to withdraw its title if the biosphere reserve does not meet the above criteria. Any member country participating in the network accepts these conditions. Vietnam is one of the members of the MAB-UNESCO network, so the development of a management plan for Langbiang Biosphere Reserve is a requirement.

In Vietnam, the legal framework for the management of biosphere reserves recognized by Viet Nam MAB National Committee (MAB Vietnam) is drafted by MAB Viet Nam. The draft is in the process of consultations with stakeholders to submit to the Government for approval. MAB Vietnam's support activities are just the advisory role for the Biosphere Reserves in the areas of expertise. MAB Vietnam does not have the function of state management or specialized management of activities in UNESCO recognized biosphere reserves in Viet Nam.

With the support of National Commission for UNESCO, Vietnam and Vietnam MAB National Committee, after the recognition by MAB-UNESCO under agreements signed by the Government of Vietnam with the international community, MAB Vietnam recommends the Provincial People's Committees where there are biosphere reserves to issue a decision to establish a management board with the functions, tasks and organizational structure to implement biosphere management objectives. Often, multidisciplinary, multisectoral coordination mechanisms, relationships with professional agencies and local governments as well as operational programs and plans are not covered by this decision. The decision to establish Langbiang Biosphere Reserve Management Board is an example.

3.3.2 Other Related Legal Documents

Although there is no legal document specifically focusing on the biosphere reserve at present, the management of the biosphere reserve, particularly the management of its core and buffer zones, should follow the exiting laws and decrees relevant to forest management and biodiversity conservation. Among other legal documents related to the operation of BRs, the following laws and decrees are closely linked to the management of the core and buffer zones of the biosphere reserve.

- Law on Forest Protection and Development (2004)
- Law on Biodiversity (2008)
- Decree No. 23/2006/ND-CP on the Implementation of the Law on Forest Protection and Development (2006)
- Decree No. 117/2010/ND-CP on the Organization and Management of the Special Use Forest System (2010)
- Decision No. 17/2015/QĐ-TTg on the Issuance of Regulations on Protective Forest Management (2015)

3.4 Gaps in the Existing Policy and Legislative Frameworks on Biosphere Reserve Management

3.4.1 Gaps in the Legislative Framework

As described above, there is not specific legislative framework exclusively for management of biosphere reserves recognized by MAB-UNESCO in Vietnam. Although there are laws and regulations relating to the management and conservation of forest ecosystems in special use and protection forests in the country, the following legal gaps need to be filled for

- The functions of the state government for management of biosphere reserves are generally not specified in the organizational law of PPCs and People's Councils.
- At the request of MAB-UNESCO Vietnam, the PPCs concerned have issued decisions on the establishment of biosphere reserves. However, the management boards do not have the legal basis or resources to perform their tasks that would meet the BR management objectives .

- Multidisciplinary or multisectoral coordination mechanisms have not been institutionally recognized as a requirement that stakeholders should consider for proper management of a biosphere reserve. There is no common guideline or standard template for development of a management plan of biosphere reserve in the biosphere reserve network in Vietnam.

It is, therefore, necessary to issue decisions that would i) empower LBWBR-MB to lead the coordination and collaboration among the relevant departments in the province for management of the biosphere reserve, ii) approve the management plan as part of the implementation of PPC's recognized BR management tasks, and iii) authorize LBWBR-MB and relevant departments/agencies to integrate BR management plans into sectoral and local activities. This is also aimed to secure necessary budget for implementation of the programs/sub-programs in the management plan.

3.4.2 Gaps in the Policy Framework

As described in the previous chapter of this document, the current socio-economic development plan and other master plans of Lam Dong province between 2011 and 2020 do not necessarily include interventions exclusively for operation and management of LBWBR. Some activities have been planned in the existing socio-economic development plan and master plans of the relevant agencies which have been effective in protection and management of ecosystems and development of livelihoods of local households living within the biosphere reserve. However, they were not planned under the framework of management of LBWBR. It is, therefore, still questionable whether such activities could be implemented in a systematic and synchronized manner.

Hence, the activities relevant to management of the biosphere reserve in the existing master plans should be re-aligned in the management framework of LBWBR so that LBWBR-MB and other departments could take coordinated actions for achievement of the goal of the management plan.

Ideally, sustainable management and development of the biosphere reserve should be one of the objectives set in the provincial socio-economic development plan in the next term (2021-2031) so that all the relevant sectors could program necessary actions in their own master plans and coordinate their activities with each other.

4 PRESENT CONDITIONS OF THE BIOSPHERE RESERVE

4.1 Natural conditions

4.1.1 Location – area of LBWBR

The entire BR is located in coordinates: North Latitude: 11° 41' 52" - 12° 20' 12"; East longitude: 108° 09' 18" - 108° 45' 48"

Langbiang Biosphere Reserve covers an area of 275,439 hectares, located in the northern part of Lam Dong, in the area of south Central Highlands, Vietnam, and is named after the mountain Lang Biang with its core zone of 34,943 ha within the Bidoup-Núi Bà National Park; 72,232ha of buffer zone and 168,264 ha of transition zone.

The entire area of the biosphere reserve is around the Langbiang Plateau, so the natural condition of the biosphere reserve is similar to the plateau.

4.1.2 Topographic and Slope Conditions

The highest point of LBWBR compared to sea level is 2,287 m in Bidoup mountain and the lowest is 600 m in downstream of K'rông Nô river adjacent to Daklak province. Overall, terrain tilt gradually from east to west and lower gradually from northeast to southwest. The main slope direction is to the west and southwest. The topography is strongly fragmented and high slope is surrounded by main mountain ranges such as Bidoup (2,287m), Gia Rích (1,922m), Hòn Giao (2,060m); Langbiang (2,167m); Chu Yen Du (2,051m) and Heaven Gate (1,882m).

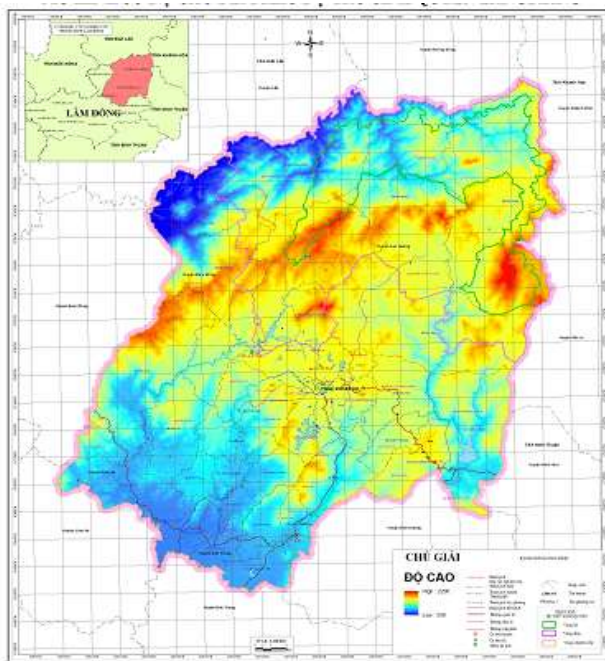


Figure 1. Topographic map of the BR

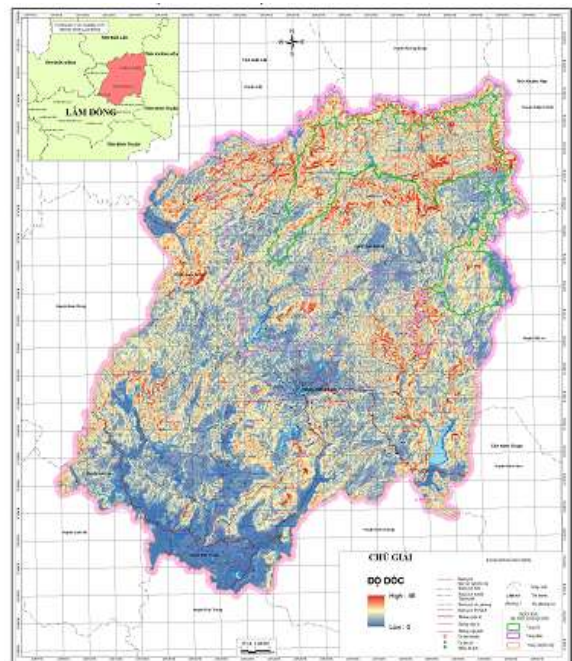


Figure 2. Slope map of the BR

4.1.3 Climate and Bioclimatic Classification

Based on the database of Da Lat station from 1978 to 2014, the characteristics of climate regime of Langbiang Biosphere Reserve are as follows:

The climate of the Langbiang World Biosphere Reserve is divided into two distinct seasons; the dry season is from November to March and the rainy season is from April to October each year.

- Average annual temperature: 17.98oC
- Average temperature of the hottest month is May: 19.5oC
- Average temperature of the coldest month is January: 15.8 oC
- Annual average max temperature is 25.87oC
- Annual average min temperature is 12.36oC

- Annual average humidity in 85.91%.
- Annual average rainfall in 1822 mm.
- The average sunshine hours per day: 5.96 hours.

Table 1. Biological climate zones of Langbiang Biosphere Reserve

Area	Average annual rainfall (mm)	Aridity index		Core zone	Buffer zone	Transition zone
		Penman	(UNEP index)			
Hyper-arid	P<100	<0,05	<0,05			
Arid	100-400	0,05-0,28	0,05-0,20			
Semi-arid	400-600	0,28-0,43	0,21-0,50			
Dry semi-humid	600-800	0,43-0,60	0,51-0,65			
Humid	800-1200	0,60-0,90	>0,65			
Wet	P>1200	>0,90		×	×	×

4.1.4 Climate and hydrological conditions

Langbiang Biosphere Reserve is the source of two rivers, Dong Nai River and the Serepok River. Average river density is 0.31 km / km². Flood season lasts 3 months (from July - September).

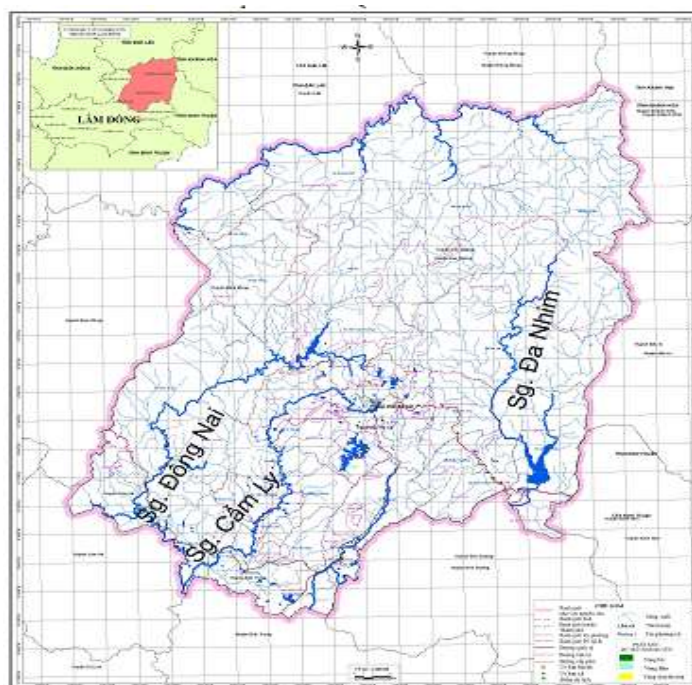


Figure 3. Hydrological map of Langbiang World Biosphere Reserve

4.1.5 Ecosystems and bio-climate zone

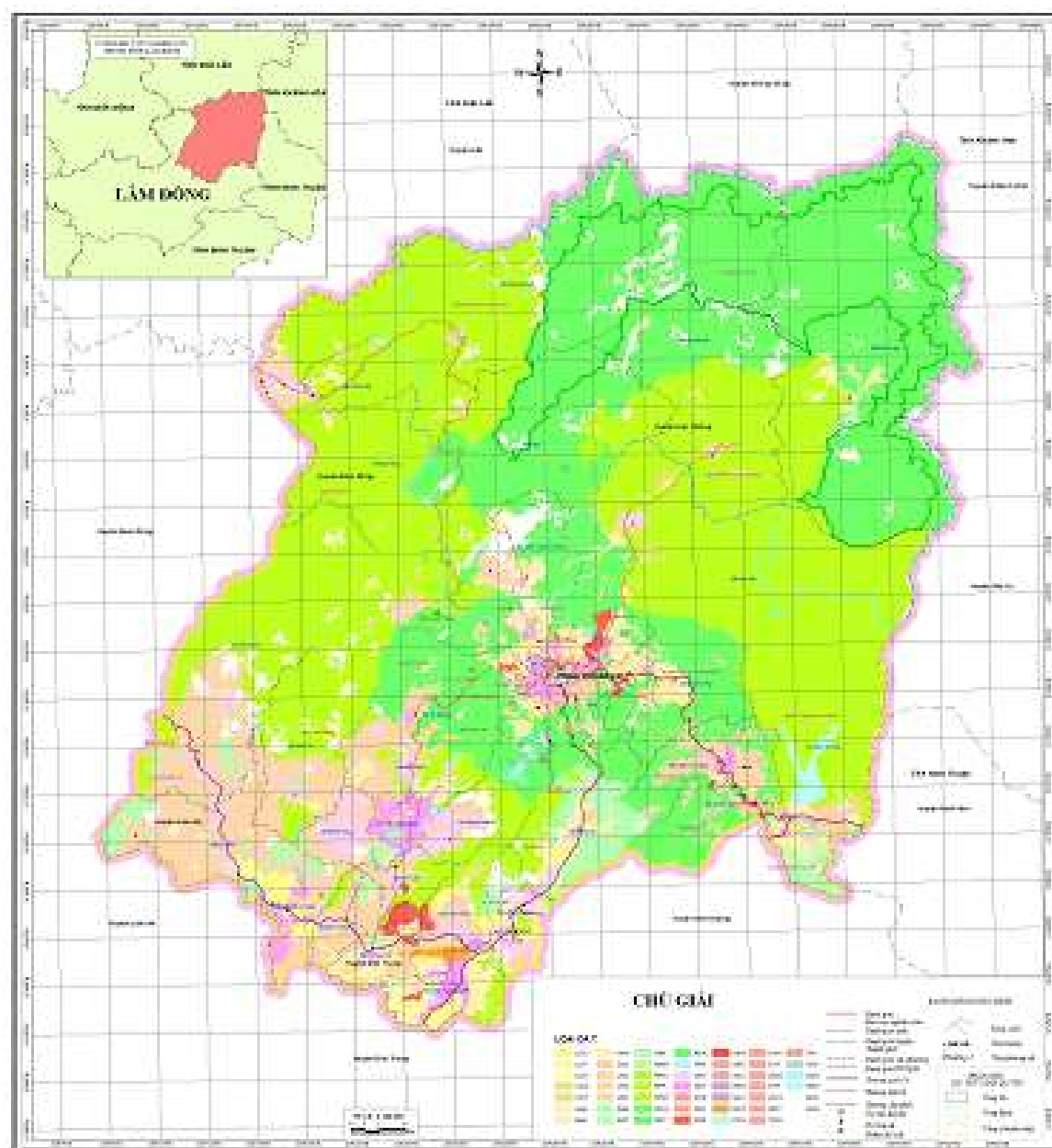


Figure 4. Map of land use status of LBWBR in 2010

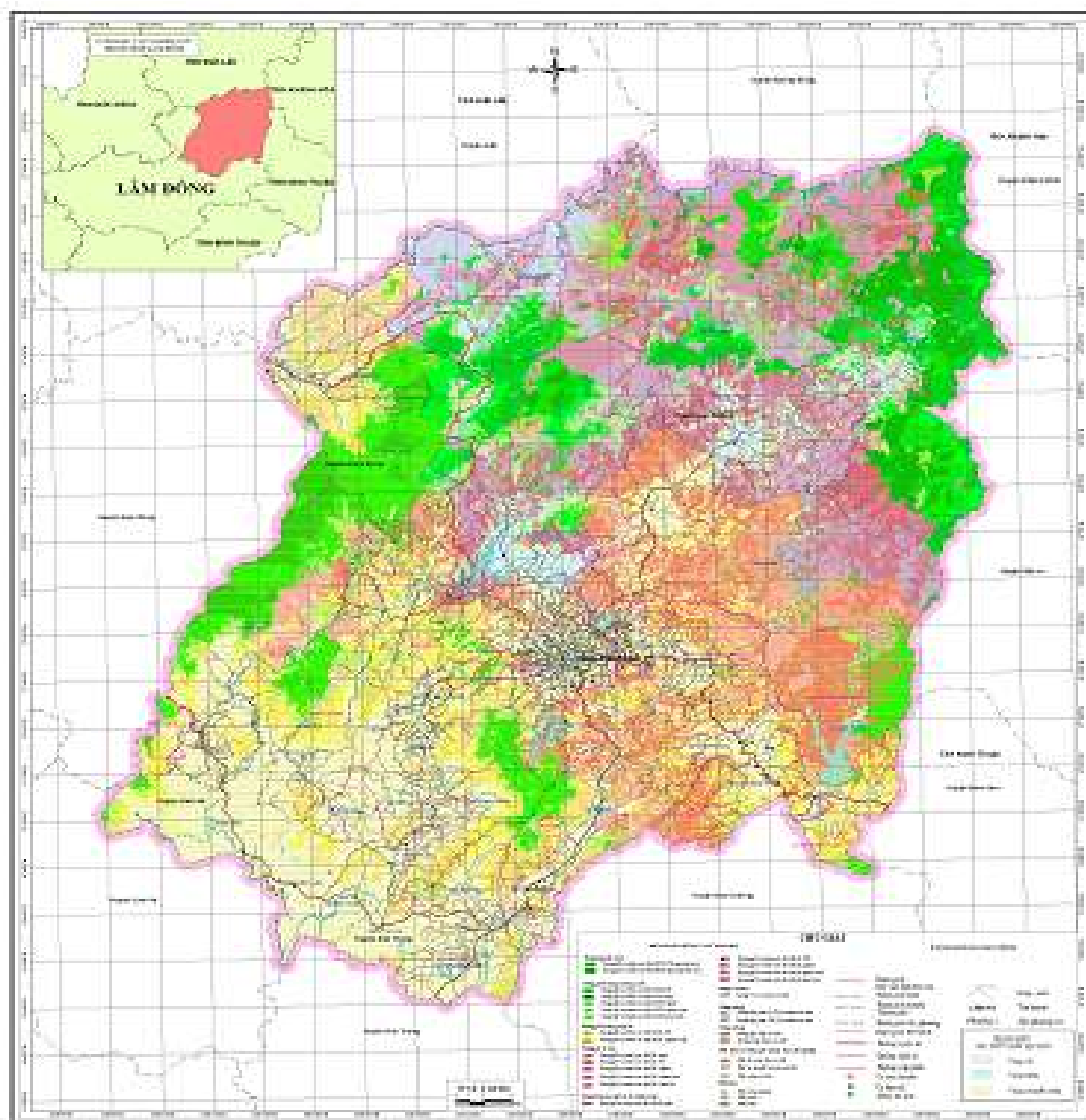


Figure 5. Map of forest cover and vegetation in LBWBR (Source: NFI&S 2016)

Main ecosystems present in the BR are as follows:

- Subtropical moist evergreen closed rainforest
- Subtropical moist broadleaf coniferous mixed forests
- Moss forest subtype
- Coniferous forest
- Broadleaf bamboo mixed forest

Among them, subtropical moist evergreen closed rainforests and subtropical moist broadleaf coniferous mixed forests are the most valuable ecosystems, with many rich biodiversity values. They have many layers and are the natural habitat of many rare and endangered species. In addition, forest ecosystems in Langbiang World Biosphere Reserve, especially in Bidoup Nui Ba National Park and Da Nhim Watershed Protection Forest, function not only as habitats for wildlife but also a corridor to maintain links with surrounding ecosystems in the Central Highlands.

4.2 Socio-economic and cultural conditions

4.2.1 Population and labor

Total population of the BR is 378,714 people, of whom 1,182 people are in the core zone (belonging to 2 villages of Dung Ksi, Klong Klanh of Da Chais commune, Lac Duong district); 24,730 people in the buffer zone and 361,802 people in the transition zone (statistic data in 2012) (Lam Dong Provincial PC, 2014).

In the buffer zone of the Biosphere Reserve, in addition to Kinh people, the ethnic minority groups mainly consist of K'Ho, M'Nong, Chu Ru, Tay.... Among them, K'Ho people account for the most with a total of 3,421 households in seven communes and one town (Da Chais, Da Nhim, Da Sar, Lac Duong Town, commune of Lat, Dung K'No, and Da Tong). Lat commune of Lac Duong district has the largest number of ethnic minorities compared with other communes in the buffer zone of LBWBR with the majority of K'Ho - Lach indigenous ethnic groups.

According to the statistic data in 2012, the population density is the highest in Dalat City with 544 people/km², 3.4 times greater than the average level of the entire region. The population density is the lowest in Lac Duong district, only 16 people /km² due to the forest covering over 87% of the district area. Regarding population growth rate, from 2005 to 2012, the population of 6 localities in the area of the BR increased by 73,577 people (an average of 9,912 people/year).

4.2.2 Livelihood of local communities

Da Lat City is a political and economic center of the province located in the transition zone of Langbiang Biosphere Reserve. In the remaining districts, people in the biosphere reserve live mainly on agricultural cultivation. In recent years, high-tech agriculture of a part of the population has well expanded leading to rapid income generation for the community, but mainly for the Kinh people and private sectors. The majority of the population is mainly

based on traditional agricultural production, contracted forest protection, non-timber forest product harvest, services, tourism, and small-scale business and other rural occupations.

Currently, there are 278 households living in Klong Klanh and Dung K'si villages of Da Chais commune in the core zone of the Biosphere Reserve. They are native inhabitants who have lived here for a long time. Households are also being mobilized to take part in forest protection contracts, gong performances as an ecotourism service and to receive forest ecosystem service payments as an alternative source of income for the earning from hunting and collecting practiced in the past.

In Lac Duong district, K'Ho is the largest indigenous group with 2872 households accounting for 74.5%. The remaining are 997 Kinh households (25.85%) living in these communes, whose livelihoods are mainly traders; only a few of Kinh people are teachers who have been teaching here for a long time. The ethnic groups mainly do agriculture. M'Nong and K'Ho ethnic groups depend mostly on forests.

Surveys on income sources of local people in the buffer zone of the BR shows that among 980 households, nearly 50% of households receive income from forest protection contracts. Other income sources come from hired labor, salary of government employees, grocery sales, local product sales, and other sources.

Villagers participating in forest protection contracts receive payment. Of the total value of forestry production in some districts of the BR, in recent years, the value of the forestry sector has been mainly driven by increased payments for forest environmental services. The income of local people is increased thanks to policies on payment for forest ecosystem services, forest allocation to indigenous households for protecting forests and leasing of forest environment services.

The following table shows the proportion of households of different income levels in three (3) places located in the buffer and transition zones of the BR.

Table 2. Proportion of Households with Different Income Levels in LBWBR

Place	< VND 24 million/HH	VND24-50 million/HH	VND50-100 million/HH	VND100-200 million/HH	VND200-360 million/HH	> VND 360 million/HH	Total
Lac Duong Town (Transition)	13.7%	24.5%	32.9%	19.2%	5.8%	3.8%	100.0%
Da Nhim Commune (Buffer)	36.4%	37.3%	19.2%	6.3%	0.9%	0.0%	100.0%
Da Chais Commune (Buffer)	38.7%	38.8%	15.1%	6.2%	1.1%	0.0%	100.0%

Source: Final Report on Socio-Economic (Financial) Survey in the Target Villages for Sustainable Natural Resource Management Project by Center for People and Environment of the Central Highland (Sep. 2016)

The data shown in the table above reveal that the majority of households in Lac Duong Town located in the transition zone generate more than VND 50 million per annum, while the

average annual income of those in the buffer zone, namely Da Nhim and Da Chai communes, is generally below VND 50 million.

4.2.3 Cultural Values

Through archaeological investigations, scientists and archaeologists have discovered that Lam Dong Province is one of the oldest settlements lands of ancient inhabitants where many ancient archaeological sites have been preserved. In particular, many of the archaeological sites are in the area of the World Biosphere Reserve such as the Old Stone Age in Dau Voi spring (Duc Trong district), the archaeological sites in P'ro commune (Don Duong district), the archaeological communal burial sites in Da Don commune (Lam Ha district)

Dalat is a famous tourist city in Southeast Asia thanks to its unique geographic location and favorable natural conditions. It also contains cultural values of various regions through the history of formation and development. There are many historical-cultural relics that have been recognized such as Xuan Huong Lake, Than Tho Lake tourist site, Camly Falls tourist site, Da Lat train station ...

The most precious intangible cultural treasure of ethnic minority communities in the biosphere reserve is the Central Highlands gong culture space recognized by UNESCO as the world's intangible cultural heritage - the oral cultural intangible masterpiece of mankind.

K'Ho brocade weaving is also one of the typical cultural values. Besides, the treasures of folk literature, festivals, customs and beliefs are extremely unique and bear many historical and humanitarian meanings of ethnic minority people, contributing to the formation of cultural space of the area.

4.3 Administration boundary

The biosphere reserve covers an area of 275,439 ha, belonging to the administrative boundary of Lam Dong province. The core zone is on an area of 34,943 ha of Lac Duong district; 72,232 ha of buffer zone is a part of Lac Duong district and Dam Rong district; The transition zone covers 168,264 ha in Don Duong, Lam Ha and Duc Trong districts. Thus, the whole BBWBR accommodates 39 communes / wards in 5 districts and Da Lat city.

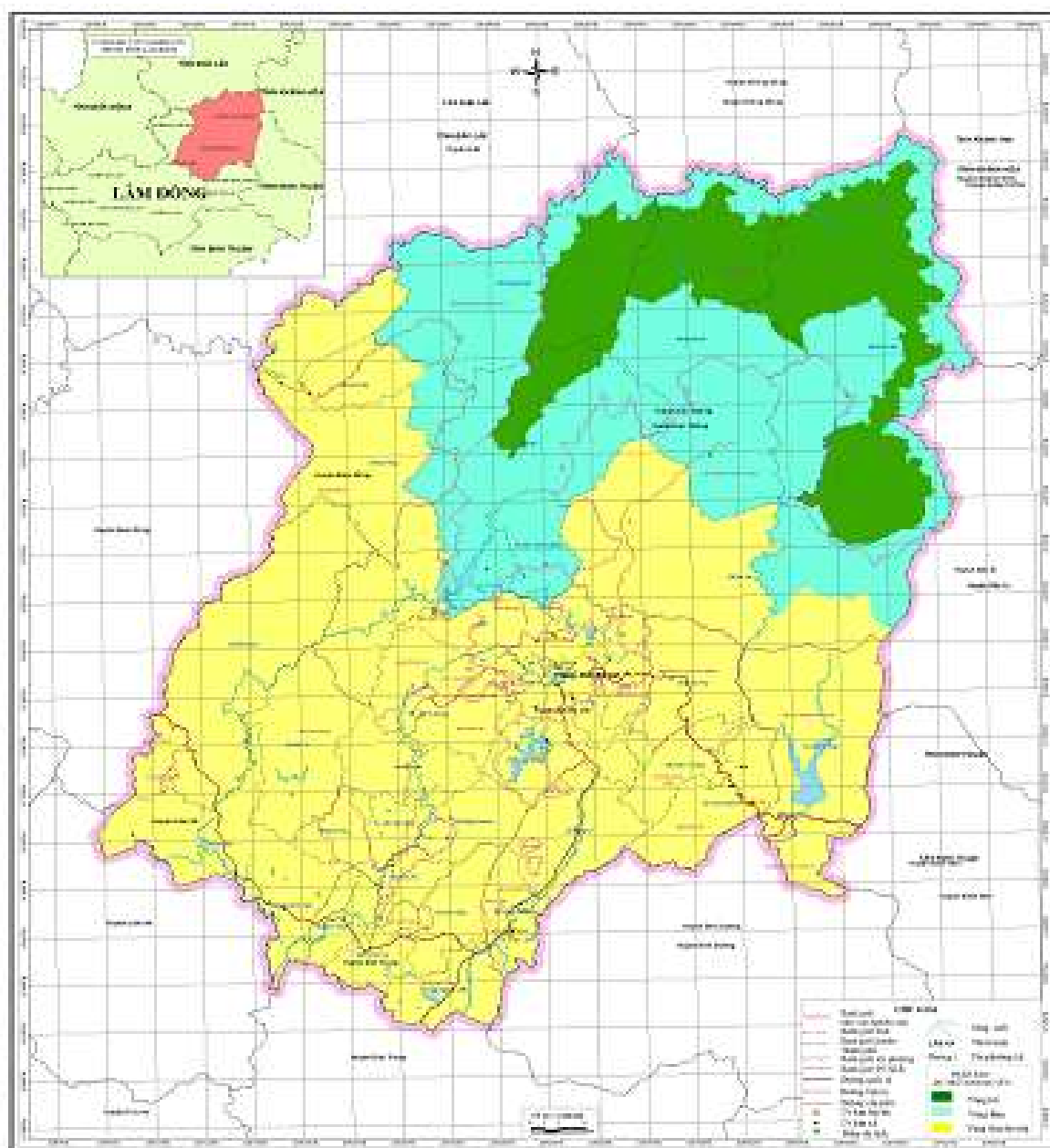


Figure 6. Administrative map of Langbiang World Biosphere Reserve

5 ISSUES TO BE ADDRESSED FOR SUSTAINABLE MANAGEMENT

5.1 SWOT analysis

The SWOT analysis was made in the stakeholder consultation meeting held in December 2016 to assess the strengths, weaknesses, opportunities and threats of Langbiang Biosphere Reserve in a participatory manner. The following table shows the results of the analysis.

Table 3. Results of the SWOT Analysis for the sustainable development of LBWBR

Strengths <ul style="list-style-type: none">- High biodiversity resources- Contains many tourism resources- Forest environmental services have been implemented- Readiness of stakeholders.- Preference of natural conditions;- Political support- The diversity of cultural identity	Weaknesses <ul style="list-style-type: none">- Fragmentation of the ecosystem;- Loss of biodiversity;- Inadequate institutions and policies;- Inadequate payment for forest environmental services- Community awareness of biosphere reserves;- Exploitation / overuse of resources;- Urbanization- Shortage of human resources
Opportunities <ul style="list-style-type: none">- There is great potential for payment for ecosystem services;- Increased resources for development investment;- Development of science and technology;- National Sustainable Development Program;- The growth of tourism and services;- Institutions and policies are improving.- International cooperation;	Threats <ul style="list-style-type: none">- The demand to use resources;- Environmental pollution- Climate change;- Diseases;- Economic Crisis;- Negative cultural mixture;- Lack of human resources;- Lack of long-term investment- Change of policies;- Change in land use planning

Moreover, the following sections describes the results of the further assessments on the major drivers causing the degradation of ecosystems and weaknesses and strengths in the institutional framework for management of the biosphere reserve.

5.2 Causes affecting sustainable development and management objectives

5.2.1 Major Direct Drivers of Forest and Ecosystem Degradation

According to reports of forest owners in Langbiang Biosphere Reserve, hundreds of cases of forest destruction and occupation are reported every year mainly due to the expansion of agricultural lands. The exploitation of NTFPs has also increased and almost uncontrolled, which has caused serious damage to the region's biodiversity. More than 70% of violations of regulations on forest management and protection relate to the expansion of agricultural land and invasion of forest land.

When land becomes a commodity, unofficial trading and transfers cause many difficulties for managers. The problem of land accumulation in accordance with the market rules has made some people lack of land for production and therefore, they have continued to enter the forest to encroach forest land.

In addition, the activities also have significant and immediate impacts on the integrity of the landscape and the entire ecosystem, such as sand mining for growing construction needs in river basins that deform the river, spontaneous exploitation of tin ores in the biosphere reserve community.

5.2.2 Factors affecting Management of Ecosystems in the Biosphere Reserver

(1) Unsynchronized/Unsystematic Policies/Legislation

The lack of synchronous and unorganized mechanisms and policies also has a direct impact on the management of biosphere reserves. Examples of this can be found in laws such as land law, biodiversity conservation law, and forest protection and development law.

While the Land Law recognizes barren land in the protected areas as unused land, so it can be separated from forest land to provide for land use needs, but these areas are very important for herbivores. Or the Biodiversity Law regulates state management of biodiversity by the natural resources and environment sector, but the problem is that biodiversity lies within forest resources managed by the forest sector.

The issue of payment for forest environmental services is not in line with economic principles when the services provided by ecosystems to the community are not properly calculated maintain and develop ecosystem services.

In addition, the lack of mechanisms, policies and resources to sustain the management of biosphere reserves is also a direct constraint affecting management effectiveness.

(2) Rapid Economic Development

Rapid development is currently having a number of negative impacts on sustainable development, such as the development of high-tech agriculture. In recent years, the area of greenhouse gases in the entire biosphere reserve has increased rapidly as an indirect cause of major floods in the rainy season.

The landscape deformed by bulldozing around the Langbiang Plateau greatly influenced the preservation of this heritage. In addition, the construction of the infrastructure also causes the fragmented ecosystems leading to biodiversity degradation.

(3) Perceptions of Stakeholders.

The ecosystem services of Langbiang Biosphere Reserve provide the basis for sustainable development at the present time and in the future not only in the locality but also in the whole region and nation. However, these ecosystems are in very vulnerable conditions and at risk of disappearing when the responsibilities and obligations of the involved parties are not fully implemented for a common goal.

Historically, ecosystem services have traditionally been considered free-for-all, a common approach to the "tragedy of the common" in which essential goods of the ecosystem such as clean water has been consumed to the point of exhaustion. A cooperative management mechanism that clearly defines the roles, responsibilities, rights, and obligations of the stakeholders in the resource management and use of the Langbiang Biosphere Reserve is very necessary.

(4) Lack of a Monitoring and Evaluation Mechanism.

A complete management plan but in lack of monitoring and evaluation will directly affect management objectives. Monitoring and evaluation aims at reviewing, updating, and adjusting activities to achieve the desired performance of managers. For Langbiang Biosphere Reserve, monitoring and evaluation is also the basis for implementing the Government of Vietnam's commitment to the international community in relation to the MAB-UNESCO Program.

5.3 Weaknesses and Strengths in the Institutional Framework

5.3.1 Institutional framework of the Management Board of Lang Biang World Biosphere Reserve

The Langbiang BR Management Board was established under Decision 1164/QĐ-UBND signed by Lam Dong People's Committee on 3 June 2016 (Lam Dong PC, 2016).

The function of the Langbiang Biosphere Reserve Management Board is to assist the Lam Dong People's Committee to coordinate and carry out management activities, international cooperation, scientific research and investment attraction for conservation-related projects in the biosphere reserve according to Vietnamese law.

The main tasks of the Management Board of Langbiang Biosphere Reserve are: formulation of a management plan, management and implementation; Organizing a cooperative management platform/forum; Mobilizing resources for conservation and development; Carrying out propaganda, promotion and introduction programs; Proposing and implementing scientific research projects; acting as a focal point to make contact with UNESCO and MAB Vietnam.

The Management Board consists of 9 members working on a part-time basis headed by a Vice Chairman of the Provincial People's Committee. There is also a secretariat and an

advisory council of national and international scientists, managers of enterprises and 01 full-time staff.

The resources to sustain the activities of the LBBR MB are supported by the PPC budget. In the establishment decision of Lam Dong People's Committee does not specify any activities of the LBBR MB. It is impossible to coordinate and allocate budget. Therefore, the management plan of Langbiang Biosphere Reserve is a priority task of the LBBR MB. This was confirmed in the establishment decision of Lam Dong People's Committee.

5.3.2 Weaknesses

- There is no management plan approved by competent authorities;
- There is no coordination mechanism with related parties to perform the functions of the Management Board;
- There is no specialized institution arrangement to fully implement the tasks of the Management Board;
- The Management Board includes part-time staff. Participation in the Management Board often increases the tasks in the job description of the members. So the MB members spend limited time on the biosphere reserve activities.
- Awareness of the community and stakeholders on the function and importance of the BR is unequal; and
- Lack of funds for management activities of the Management Board (for example, there is no long-term salary for the group of specialized staff); There is no sustainable financial mechanism.

5.3.3 Strengths

- The establishment and maintenance of the activities of the Management Board has received the support and interest of Lam Dong People's Committee;
- The willingness to support of stakeholders and local communities;
- Support from UNESCO Vietnam and MAB Vietnam National Committee;
- The members of the Management Board are enthusiastic and experienced in managing work with professional knowledge;
- The management objectives of Langbiang Biosphere Reserve are in line with the sustainable development objectives that the provincial People's Committee is implementing;
- The forest owners in the biosphere reserve have long experiences in managing forest resources and collaborating with local residents for management and protection of forests; and
- Technical assistance from the Japan International Cooperation Agency (JICA).

6 VISION OF THE BIOSPHERE RESERVE AND OBJECTIVES OF THE MANAGEMENT PLAN

6.1 Vision of the Biosphere Reserve

“To maintain and develop the natural ecosystems and cultural diversity of the Langbiang Biosphere Reserve to serve the sustainable development goals of Lam Dong Province, and to contribute to the achievement of the sustainable development goals of the United Nations.”

Therefore, the vision defines the wish for a better future for Langbiang World Biosphere Reserve not only for the members of the Management Board but also for the stakeholders relating to LBRR, especially residents living in the biosphere reserve.

6.2 Objective and Targets of the Management Plan

6.2.1 Objectives

In order to realize the vision statement described above, this management plan set the following objectives:

- Conservation of natural ecosystems
- Conservation of cultural diversity
- Sustainable economic development in the area
- Contribution to environmental education and scientific researches
- Maintenance of a multisectoral cooperation mechanism

A multi-sectoral cooperation mechanism is established to protect, maintain and develop ecosystem services, ensure people's well-being and advanced economic development, and be linked to sustainable development objectives. of the 2030 Agenda for Sustainable Development in Vietnam.

(1) Conservation of Natural Ecosystems

The natural ecosystems, especially those which are natural habitats of valuable and rare/endangered species, should be conserved and rehabilitated to maintain rich biodiversity in the biosphere reserve, as they are one of the core values of LBWBR.

(2) Conservation of Cultural Diversity

At the same time, the cultural diversity in the biosphere reserve, particularly traditional culture of ethnic minorities that reside in the vicinity of the area with valuable forest ecosystems is another core value of the biosphere reserve. They should be preserved and maintained along with the ways of life of ethnic minorities considered as one of the unique elements/features.

(3) Sustainable Economic Development in the Area

Sustainable socio-economic development is the main goal of the socio-economic development plan as well as the sustainable development strategy of Lam Dong Province. In

particular, environmentally sound development in and around the Dalat city is a prerequisite to sustainable development of the biosphere reserve as rapid economic development has caused environmental degradation and disastrous events which would eventually affect human lives.

(4) Contribution to Environmental Education and Scientific Researches

One of the functions that the biosphere reserve is expected to fulfil is to provide environmental education and scientific researches using the resources in the biosphere reserve. Especially, the natural and social peculiarities of the biosphere reserve, namely rich biodiversity in the core zone and indigenous knowledge of ethnic minorities living in the buffer zone, are valuable materials for environmental education and natural and social researches. The biosphere reserve should be fully utilized as a place of study and learning.

(5) Maintenance of a Multisectoral Cooperation Mechanism

The Langbiang Biosphere Reserve Management Board (LBWBR-MB) was established following a multi-sectoral cooperation mechanism to: i) protect, maintain and develop ecosystem services, ii) ensure people's well-being and contribute to economic development, and iii) link to sustainable development goals of the 2030 Agenda for Sustainable Development in Vietnam. As the multi-sectoral approaches are required for realization of the vision statement of the biosphere reserve, this multisectoral cooperation mechanism should be maintained and strengthened in the course of the implementation of the management plan.

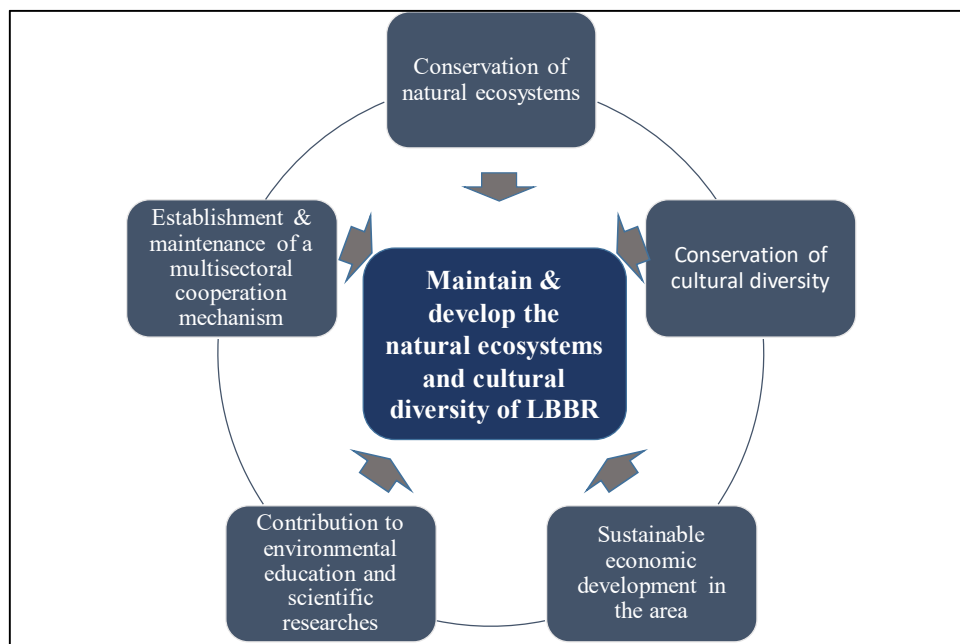


Figure 7. Objectives of the Management Plan

6.2.2 Targets (Indicators of Objectives) to 2022

Specifically, the following targets are set as indicators of the objectives of the management plan.

- a. The rate of natural forest loss/degradation will be reduced by 50 % as compared to the same period from 2010-2015.
- b. The marketing brand based on the natural and social settings of the biosphere reserve will be widely known among local residents living in LBWBR and visitors to Da Lat.
- c. The average annual income of households residing in the buffer zone will increase by 20% compared to the income in 2016/2017.
- d. Research data on natural ecosystems and biodiversity in the core and buffer zones in the biosphere reserve will be accumulated and stored systematically.
- e. Environmental education and eco-tourism tours will be programmed and organized regularly in the buffer zone.
- f. LBWBR-MB will monitor the progress of this management plan on a regular basis, evaluate the results of the collaborative actions taken by the members, and develop the next five-year management plan based on the results of the evaluation in a participatory manner.

6.2.3 Milestones of the Activities (Indicators of the Activities) planned in the Management Plan till 2022

To achieve the targets of the specific objectives of the management plan, the following indicators are set as milestones of the activities in the course of the implementation of the management plan.

- 1) A collaborative management (CM) model being currently introduced and tested by the JICA Project (SNRMP) for sustainable management of existing forests in special use and protection forests in the biosphere reserve will be applied to more than 20 % of villages in the buffer and core zones by the end of 2022.
- 2) The incidence of agricultural land occupation will gradually decline in the areas covered by the CM model in the biosphere reserve, and especially, the number of such cases will be reduced by 20 % by the end of 2022 as compared to the figure in 2017.
- 3) More than 70 % of activities of the programs/sub-programs planned in the management plan will be carried out by the relevant stakeholders by the end of 2022.
- 4) The brand marketing with core values of LBWBR will be developed and by the end of 2020
- 5) The marketing brand will be used for introducing and selling local products/commodities produced in the biosphere reserve by the end of 2019 .
- 6) More than 3 sustainable livelihood development options which can be introduced in the core zone will be developed and demonstrated in the biosphere reserve by the end of 2018.

- 7) Environmental education and community-based eco-tourism programs will be organized in the biosphere reserve, especially in the buffer zone, on a regular basis in partnership with the private sector by the end of 2017.
- 8) The forest ecosystems and biodiversity in the biosphere reserve, especially in the core zone, will be regularly monitored by the forest owner, i.e., BNNBP-MB, and the monitoring data will be stored by the forest owner in collaboration with DARD/MARD and DONRE/MONRE in a systematic manner.
- 9) LBWBR-MB will develop and implement an annual management plan with budget estimates based on this five-year management plan every year after approval of this five-year plan.
- 10) By the end of 2022, over 70% of CM model members will apply sustainable livelihood options
- 11) LBBR-MP will monitor the progress of the implementation of the management plan on a quarterly basis from 2018 to be reported to Provincial PC and propose solutions to any issues/difficulties with stakeholders in the course of the implementation of the management plan.

Targets and target description will be adjusted within one year based on the results of activities of programs/sub-programs performed by agencies and departments.

6.3 Strategic Approaches taken

6.3.1 *SLIQ: (System thinking, Landscape planning, Inter-sectoral coordination, and Quality economy) Approach (Tri et al., 2014)*

The biosphere reserves as the "model" systems on Earth, the management of the biosphere reserve is based on the motto "System thinking, landscape planning, intersectoral coordination, quality economy," which could be the guide for all sustainable management models of the biosphere reserves. The principle ideas on the SLIQ approach are described below.

- **Systems Thinking:** which is an approach applied academically as well as practically to achieve harmonization of conservation with development;
- **Landscape Planning:** which is the zonation of the different landscapes of the biosphere reserve into the 'three-zone-scheme' of UNESCO-MAB, which involves ecology-based planning under consideration of the various political-ecological-cultural tenures;
- **Inter-sectoral Coordination:** which aims to achieve mutual understanding and partnerships between/among state, market and civil society through multistakeholder involvement and combination of bottom-up and top-down approaches; and

- **Quality Economy:** which aims at building a conservation-based/green economy and sustainable development by introducing biosphere reserve labelling for goods and services.

The necessity of introduction of the SLIQ approach in LBWBR is further highlighted below.

Table 4. SLIQ Approach in Langbiang BR

SLIQ	Description
System thinking	From a system viewpoint, the biosphere reserves are systems that consist of many components and express very well the diverse, complex relationships, and connect the natural and socio-economic components, structure and material architecture with human values, cultural spaces and natural landscapes, ecological politics and creative ecology ... System thinking is an effective tool to help managers and policymakers have appropriate solutions to practical issues that are constantly moving, complex and changing over time and space.
Landscape planning	In recent years, landscape planning has been applied in many fields, especially is related to land use and modeling, forecasting the changing of landscape, environment in the future. Ecological landscape researchers are very interested in the impact of territorial fragmentation by industry and agricultural development on biodiversity conservation. The territorial fragmentation by human activities is presented in two factors: the habitat area of the wildlife (natural environment in the landscape) is degraded and the remaining fragments are isolated. How to connect the remaining fragments are needed for ecological landscape researchers. Maintaining biodiversity needs studies on ecological landscape.
Inter-sectoral coordination	<p>The Biosphere Reserve provides a new way of thinking about conservation science, it not only shows the relationship between people and nature from inside and around those areas but also shows how to harmonize, respond/meet the social needs for a sustainable future.</p> <p>The biosphere reserves often have large areas covering national parks, nature reserves, protected areas, and Ramsar sites (Ramsar Convention for the Conservation of Migratory Birds of International Importance), The World Heritage Site ... So, there will be a lot of national, international and local legislations and documents in a biosphere reserve. This shows that the management of the biosphere reserves is in fact coordinating and making the most of existing local human and financial resources.</p> <p>The biosphere reserve shows a lot of functions compared with protected areas and nature reserves. The essence of interdisciplinary co-ordination and the sharing of benefits and responsibilities in the management of natural resources by those working in agriculture, forestry and fisheries, scientists, local communities, government and state agencies, the world community ...</p> <p>The biosphere reserve is a model that actually solve conflicts in land use and biodiversity conservation, creating opportunities in education, entertainment and tourism, and the sense of solidarity among all people around the world for the sustainable management of the biosphere, the earth which is our common house.</p>

SLIQ	Description
Quality economy	<p>More and more internationally recognized titles will create more investment opportunities for conservation and development. These titles are put into annual investment plans when compared to other places without these titles, are always predominant. In Vietnam there are typical examples such as Cat Tien, Xuan Thuy (national park, biosphere reserve, Ramsar area), Cat Ba (national park, biosphere reserve, marine protected area). Cat Ba Biosphere Reserve has been selected by UNESCO / MAB for projects in Southeast Asia and the world "using the biosphere as learning laboratories for sustainable development" with participation of agencies, associations, private economic sectors.</p> <p>Some activities to develop quality economy such as registration of brand for goods and geographical indications, control of pollution and the number of visitors, models of four participating houses: scientist, manager, enterprise and local people, capacity and 'ecological disaster', the principle of "iceberg"</p>

6.3.2 Participatory approach

The participatory approach will be employed to ensure the participation of stakeholders in order to i) harmonize the point of views and benefit of the parties and ii) provide opportunities for weak groups to participate in the processes of planning, implementation and monitoring and evaluation of the results. This approach also aims to harmonize between policy of departments (top-down) and participation of people (bottom-up).

Specifically, the following 05 groups of stakeholders should be involved in the processes.

- a. Group 1: Governmental Administrative organizations: People's Committees at provincial, district and commune levels, Departments (Natural Resources and Environment, Science and Technology, Agriculture and Rural Development, Finance, Education and Training, Planning and Investment, Foreign Affairs ...), Langbiang BR Management Board, ...
- b. Group 2: Governmental Functional Organizations/Public non-business units:, national parks, protection forest MBs, agricultural extension centers
- c. Group 3: National and international academic/ educational / scientific/ development /research organizations
- d. Group 4: Businesses and enterprises are located / interested in Langbiang BR
- e. Group 5: Local communities and civil society organizations (Youth Union, Women's Unions, Farmer's Association, Veterans Association, non-governmental organizations ...), Community Learning Center

6.3.3 Inter-Sectoral Approach

The biosphere reserve needs to be managed with the linkage of stakeholders in management based on the existing policy systems to solve complex issues which could be understood and solved only by combining the point of views of two or more different sectors/fields.

6.3.4 *Ecosystem-based Approach*

The 12 principles in "ecosystem-based" management described below shall be observed and followed in the management of the biosphere reserve.

1. The objectives of management of land, water and living resources are a matter of social choices.
2. Ecosystem management should be decentralized to the lowest appropriate level.
3. Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.
4. Ecosystem management should be done regularly in a specific economic context, through which potential gains from management could be recognized: decrease in market drawbacks negatively affecting biodiversity, encouraged promotion of sustainable use and conservation of biodiversity and feasible planning for costs and benefits of a given ecosystem
5. Conservation of ecosystem structure and functions, should be a priority target of the ecosystem approach.
6. Ecosystems must be managed within the limits of their functioning.
7. The ecosystem approach should be undertaken at the appropriate spatial and temporal scales.
8. Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term.
9. Management must recognize the change is inevitable.
10. The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.
11. The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.
12. The ecosystem approach should involve all relevant sectors of society and scientific disciplines.

The management of LBWBR should involve the participation of all stakeholders under the following groups:

- a. Group 1: Governmental Administrative organizations: People's Committees at provincial, district and commune levels, Departments (Natural Resources and Environment, Science and Technology, Agriculture and Rural Development, Finance, Education and Training, Planning and Investment, Foreign Affairs ...),...
- b. Group 2: Governmental Functional Organizations/public non-business units: national parks, Protection Forest MBs, agricultural extension centers ...
- c. Group 3: National and international academic/ educational / scientific, research, development, organizations

- d. Group 4: Bussinese and enterprises are located / interested in Langbiang BR
- e. Group 5: Local communities and civil society organizations (Youth Union, Women's Unions, Farmer's Association, Veterans Association, non-governmental organizations ...), Community Learning Centers

6.4 Zonation and functions in LBWBR

6.4.1 Functions of LBW BR

Langbiang World Biosphere Reserve has three main functions: conservation, development and support.

- (1) Conservation: Conserve the core values of the biosphere reserve to serve sustainable development.
- (2) Development: Encourage and promote economic development as well as human development, in which socio-cultural and ecological sustainability is secured.
- (3) Support: support for demonstration, environmental education and training, research and monitoring projects relating to local, regional, national and global conservation and sustainable development issues

6.4.2 Zonation

Langbiang Biosphere Reserve is aimed toward the integrated management of soil, fresh water and living resources by planning the biological area on the basis of appropriate zoning. Langbiang World Biosphere Reserve's special zoning system is based on land use practices and opportunities while the integration of conservation and sustainable development is facilitated through the dissemination of knowledge and collaborative management.

As described in the previous section “strategic approaches taken,” the areas of the biosphere reserve are classified into three (3) management zones to fulfil three mandatory and mutually reinforcing functions defined by UNESCO*:

1. The core area(s) comprises a strictly protected ecosystem that contributes to the conservation of landscapes, ecosystems, species and genetic variation;
2. The buffer zone surrounds or adjoins the core areas, and is used for activities compatible with sound ecological practices that can reinforce scientific research, monitoring, training and education; and
3. The transition area is the part of the reserve where the greatest activity is allowed, fostering economic and human development that is socio-culturally and ecologically sustainable.

In line with the principles described above, the three (3) zones are delineated in the biosphere reserve in consideration of the following conditions.

- Current forest and vegetation covers
- Existing boundaries of national parks and protection forests (including sub-zones of the national park)
- Present and future land use

* Man and Biosphere Programme, UNESCO

As a result, 34,493 ha in Lac Duong district, 72,232 ha, which overlaps with parts of Lac Duong district and Dam Rong district, and 168,264 ha in Da Lat city, Don Duong, Lam Ha and Duc Trong districts are classified into three (3) zones: core, buffer, an transition zones, respectively. The zoning map of the biosphere reserve is shown in the figure below:

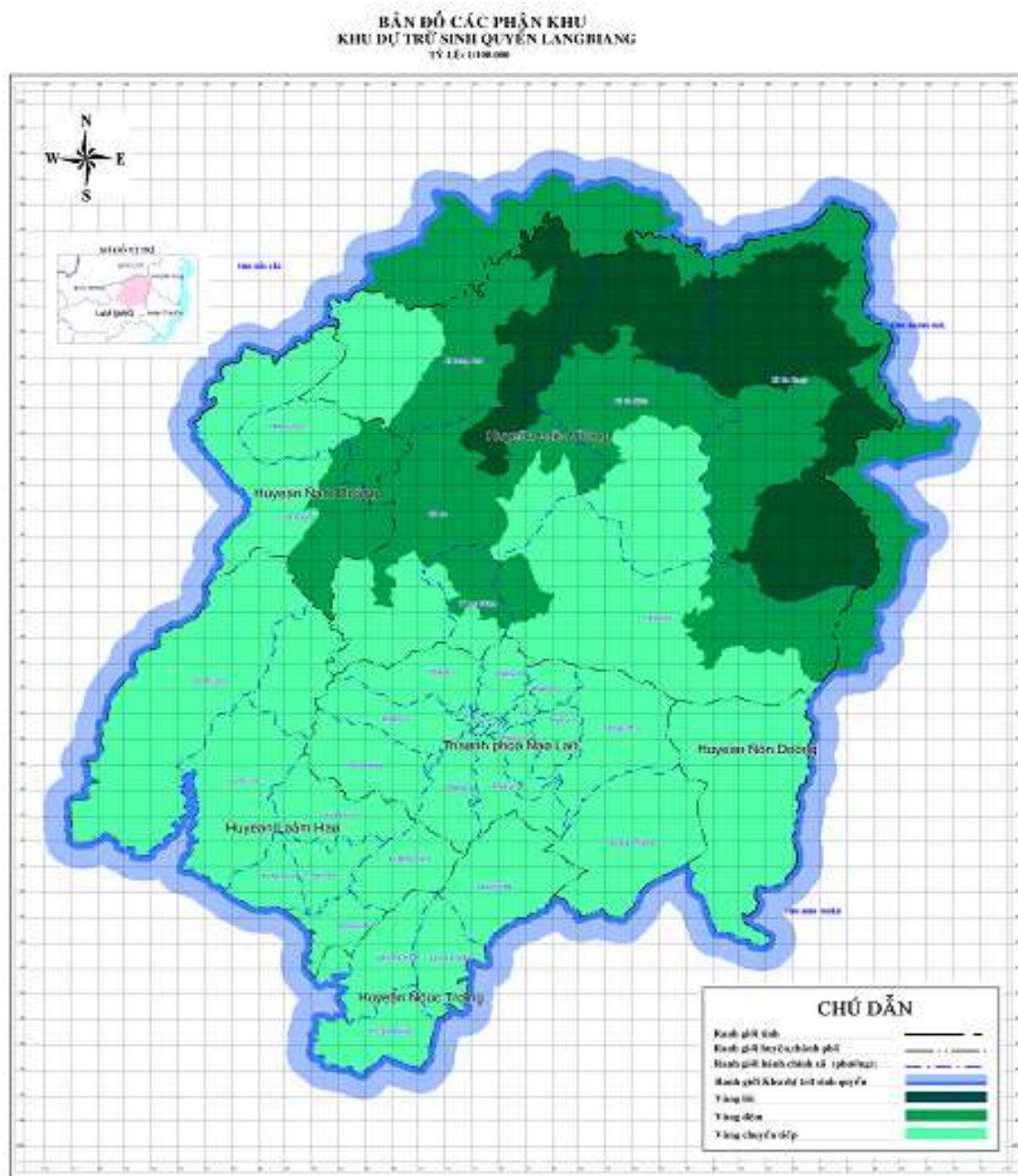


Figure 8. Zoning Map of the Langbiang World Biosphere Reserve

6.4.3 Roles and activities in functional zones

Table 5. Expected roles and activities to be carried out in the zones

Zones	Roles	Activities to be carried out
Core zone	<ul style="list-style-type: none"> Conserve natural ecosystems, biodiversity, and genetic resources in the biosphere reserve. 	<ul style="list-style-type: none"> Protection of forests (Patrolling and other protection activities) Conservation of forest ecosystems and

Zones	Roles	Activities to be carried out
	<ul style="list-style-type: none"> • Provide scientific data on forest ecosystems, biodiversity and genetic resources. • Provide indigenous knowledge which can be used for adaptation to climate changes 	<p>biodiversity (including rare species and genetic resources)</p> <ul style="list-style-type: none"> • Scientific research • Monitoring of forest resources, ecosystems, and biodiversity • Socio-economic survey
Buffer zone	<ul style="list-style-type: none"> • Provide additional sources of income / livelihoods from sustainable management of forest and other resources. • Restore and rehabilitate forest ecosystems. • Provide venues and opportunities for environmental education, community-based eco-tourism, and researches. • Maintain traditional culture and life styles of ethnic minorities. 	<ul style="list-style-type: none"> • Reforestation of indigenous trees • Development of nurseries for <i>Pinus kesiya</i>, <i>Pinus krempfii</i> • Introduction of environmentally-friendly agriculture / livelihood options • Promotion of community-based eco-tourism • Operations of village-based tourism activities, such as gong performance • Conduct of environmental education • Monitoring of forest resources and ecosystems • Socio-economic survey
Transition zone	<ul style="list-style-type: none"> • Introduce and develop high-tech but environmentally-friendly agriculture (Produce vegetables, flowers, and other high-value crops/plants.). • Develop the tourism industry combined with community-based ecotourism • Market products/commodities produced in the buffer zone. • Provide employment opportunities to local residents in the biosphere reserve, especially those in the buffer zone. 	<ul style="list-style-type: none"> • Improvement of high-tech agriculture by introduction of environmental friendly agriculture techniques • Reforestation of indigenous trees • Urban afforestation/greening • Development of marketing brand of local commodities/products • Organization of events for promotion of green development / sustainable development • Provision of vocational training for local residents, especially ethnic minorities • Conduct of environmental education • Monitoring and evaluation of development activities • Socio-economic survey

7 ACTION PLAN OF THE MANAGEMENT PLAN

7.1 Proposed programs of the Management Plan

The proposed programs are mapped out on the basis of the overall socio-economic development plan of Lam Dong province up to 2020 approved by the Prime Minister in Decision No. 1462/QĐ-TTg dated 23 August 2011; Decision No. 1119/QĐ-UBND dated June 10, 2013 of the People's Committee of Lam Dong Province approving the action plan for the implementation of the sustainable development strategy for 2011-2020 in Lam Dong; Resolution No. 137/NĐ-HĐND dated July 11, 2015 by the Lam Dong People's Committee on the proposed public investment plan for 2016-2020; Decision No. 2527/QĐ-UBND dated 20/11/2014 of the People's Committee of Lam Dong Province approving the implementation plan of the national environmental protection strategy until 2020 and vision to 2030; Decision No. 169/QĐ-UBND dated 28/8/2015 of the People's Committee of Lam Dong Province approving the biodiversity conservation master plan of the Lam Dong province until 2030; Decision No. 673/QĐ-UBND dated 8/04/2013 of the People's Committee of Lam Dong Province approving the plan for implementation of the Vietnam's tourism development strategy to 2020 and vision to 2030; and Functions and duties of the Langbiang Biosphere Reserve Management Board.

To achieve the objectives of the management plan, the management plan proposes a total of nine (9) action programs, which shall be implemented in close coordination and cooperation with the relevant departments and organizations concerned with LBWBR.

Table 6. Action programs of Langbiang World Biosphere Reserve

- (1) Natural Resource Conservation program.
- (2) Program for preserving cultural values
- (3) Environmental- friendly economic development support program
- (4) Responsible tourism development program
- (5) Environmental pollution reduction program
- (6) Environmental education and communication program
- (7) Scientific research program.
- (8) M & E program.
- (9) International cooperation program.

7.2 Sub-programs programmed in the Management Plan during 2018-2022

To meet the achievement goal, the nine (9) proposed programs listed above are further broken into 36 sub-programs as listed below. These sub-programs including activities or

different projects will be implemented by the relevant departments/organizations in LBWBR under the supervision of the Lam Dong PPC for the next five (5) years (2018-2022).

Table 7. Sub-programs proposed in the Management Plan

- 1. Natural Resource Conservation program**
 - 1.1. Protection of forest resources
 - 1.2. Forest fire prevention
 - 1.3. Planning for conservation and sustainable development of the BR
 - 1.4. Conservation of biodiversity
 - 1.5. Building of botanical gardens and animals parks
 - 1.6. Development of the collaborative management model for natural resource management
- 2. Program for Preserving Cultural Values**
 - 2.1. Proposed intergration mechanism of cultural and natural conservation
 - 2.2. Preservation of indigenous knowledge and traditional festivals
 - 2.3. Preservation of gong culture (recognized by UNESCO)
 - 2.4. Restoration of traditional handicrafts
 - 2.5. Construction of the Museum of Central Highlands nature and culture
- 3. Program for Support in Environmentally-friendly Economic Development**
 - 3.1. Payment for forest environment services
 - 3.2. Planning of conservation and sustainable development of biosphere reserve
 - 3.2. Building and development of BR brand
 - 3.3. Promotion of public-private partnership in biosphere reserves
 - 3.4. Green growth, ecological village, green urban areas
 - 3.5. Development of sustainable livelihood models
- 4. Responsible Tourism Development program**
 - 4.1. Development of tourism promotion strategies
 - 4.2. Development of agricultural tourism models
 - 4.3. Development of community tourism models
- 5. Environmental Pollution Reduction program**
 - 5.1. Monitoring and evaluation of environmental quality
 - 5.2. Waste management (solid, waste water)
 - 5.3. Classification of domestic waste at source (3Rs)
 - 5.4. Waste management model (eco-toilets, biogas, compost, etc.)
- 6. Environmental Education and Communication program**
 - 6.1. Development of a communication strategy on biosphere reserve values
 - 6.2. Building and operation of the website and social network of the biosphere reserve
 - 6.3. Environmental education
- 7. Scientific Research program**
 - 7.1. Development and proposal of scientific research topics
 - 7.2. Coordination with the implementation of scientific researches
 - 7.3. Application and transferring of sciences and technologies
- 8. M & E program**
 - 8.1. Monitoring of the implementation of the management plan
 - 8.2. Biodiversity monitoring
 - 8.3. Evaluation according to the requirements of the biosphere reserves
 - 8.4. Development of a five year investment project (2020-2025) and plan for expanding the BR
- 9. International Cooperation program**
 - 9.1. Cooperation with MAB-UNESCO
 - 9.2. Cooperation with the biosphere reserve network in the world
 - 9.3. International cooperation in scientific research in the biosphere reserve

All the 36 sub-programs are in line with the existing plans of Lam Dong province, particularly Socio-economic Development Master Plan of Lam Dong province. Although most of them are described or listed in the existing plans, some of them are newly proposed in the BR Management Plan to enhance the functions of the biosphere reserve, namely conservation of forest ecosystems, contribution to socio-economic development of local communities, and environmental researches and education.

The table shown below describes the outline of the 36 sub-programs and their relationship with the existing plans (master plans and action plans). It is noted that the sub-programs may contain several activities (or sub-programs) relating to the objectives of the respective sub-programs.

Table 8. Relationship between the sub-programs proposed in the LBWBR Management Plan and master plans, plans, projects being implemented in Lam Dong

No	Sub-programs/activities	Outline of the Sub-programs/Activities	Related to plans <1
1	Natural Resource Conservation program		
1.1	Protection of forest resources	<ul style="list-style-type: none"> Protect forests, especially forests existing in the core and buffer zones of the biosphere reserve in collaboration with the forest owners (BNBP-MB and DWPF-MB), local communities, and CPCs. 	Socio-economic development master plan, provincial forest protection and development plan
1.2	Forest fire prevention	<ul style="list-style-type: none"> Enhance the capacities of the forest owners and district ranger offices on forest fire prevention and fire fighting through provision of fire equipment and facilities and community participation in fire control. 	Socio-economic development master plan, provincial forest protection and development plan
1.3	Planning for conservation and sustainable development of the BR	<ul style="list-style-type: none"> Making a plan for implementing forest ecosystem conservation and sustainable development in the BR based on the five-year management plan. 	
1.4	Conservation of biodiversity	<ul style="list-style-type: none"> Enhance biodiversity conservation and management in natural forest ecosystems, especially coniferous forests. Minimize negative impacts on forest ecosystems and biodiversity through i) enhancement of community awareness of biodiversity, ii) capacity development for biodiversity conservation, and iii) enhancement of community participation in biodiversity conservation. 	Action plan of biodiversity conservation strategy, biodiversity conservation planning
1.5	Building of botanical gardens and animals parks	<ul style="list-style-type: none"> Conserve endangered, precious, and rare species and genetic resources through development of conservation centers, e.g., botanical gardens and animal parks in Bidoup – Nui Ba NP. 	Biodiversity conservation planning (BCP)
1.6	Development of the collaborative management model for NRM	<ul style="list-style-type: none"> Develop and institutionalize the collaborative management model (i.e., Collaborative Management Agreement) introduced and demonstrated by the JICA Project (SNRMP) as a new management method of special use and protection forests in the core and buffer zones. 	Sustainable Forest Protection and Development Plan
2	Program for Preserving Cultural Values		

No	Sub-programs/activities	Outline of the Sub-programs/Activities	Related to plans <1
2.1	Intergration mechanism of cultural and natural conservation	<ul style="list-style-type: none"> Preserve traditional culture and indigenous knowledge 	
2.2	Preservation of indigenous knowledge & traditional festivals	<ul style="list-style-type: none"> Preserve and promote traditional festivals (such as flower festival and tea festival) and traditional cultures of different ethnic groups for tourism development. 	Socio-economic development master plan (SEDP), action plan of biodiversity conservation strategy (BCS)
2.3	Preservation of gong culture	<ul style="list-style-type: none"> Preserve the gong culture and develop a local tourist product together with local communities through gong products. 	SEDP, action plan of (BCS)
2.4	Restoration of traditional handicraft (works)	<ul style="list-style-type: none"> Restore traditional/cultural handicrafts and improve their quality to market them as quality traditional products peculiar to the biosphere reserve. 	SEDP
2.5	Construction of the Museum of Central Highlands nature and culture	<ul style="list-style-type: none"> Construct a museum of central highland nature and culture which can be used as an education, training, and scientific research center of the region. 	SEDP
3	Program for Support in Environmentally-friendly Economic Development		
3.1	Payment for forest environment service	<ul style="list-style-type: none"> Using PFES for protection and management of 3 types of forests in the BR, especially in the buffer and core zone 	Provincial REDD+ action plan
3.2	Development of BR brand	<ul style="list-style-type: none"> Develop and implement the marketing strategies with the BR brand for local commodities and products produced in the BR. 	JICA-SNRM Project
3.3	Promotion of public-private partnership in biosphere reserves	<ul style="list-style-type: none"> Promote investments from the private sector in the form of public-private partnership (PPP) for environmentally-friendly economic development project, such as bottling and marketing of clean water. 	Master plan of Bidoup-Nui Ba NP
3.4	Green growth, ecological village/ urban area	<ul style="list-style-type: none"> Promote and implement green growth activities, such as eco-urban area green rural area, green residential house, and refuse segregation mainly in the transition zone 	Green Growth program of Dalat City
3.5	Development of some sustainable livelihood models	<ul style="list-style-type: none"> Develop and promote sustainable livelihood development models introduced and tested by the JICA Project (SNRMP) in the buffer zone of the biosphere reserve 	Mountainous rural programs
4	Responsible tourism development program		
4.1	Development of tourism promotion strategies	<ul style="list-style-type: none"> Develop the strategies for promotion of tourism activities and expanding new markets for tourism development. 	Implementation plan of tourism development strategy (TDS)
4.2	Development of agricultural tourism models	<ul style="list-style-type: none"> Develop and promote green tourism models using existing farms, such as vegetables, flowers, and tea in the transition and buffer zones. 	Implementation plan of TDS
4.3	Development of community tourism	<ul style="list-style-type: none"> Develop and promote community-based eco-tourism models introduced and tested by the JICA Project 	-

No	Sub-programs/activities	Outline of the Sub-programs/Activities	Related to plans <1
	models	(SNRMP) in the buffer zone of the biosphere reserve.	
5	Environmental Pollution Reduction program		
5.1	Monitoring and evaluation of environmental quality	<ul style="list-style-type: none"> Monitor and evaluate the environmental quality in the biosphere reserve, which include the development of local environmental monitoring stations, especially automatic surface water environmental monitoring stations in key rivers in the biosphere reserve. 	Implementation plan of environmental protection strategy (EPS)
5.2	Waste management (solid, waste water)	<ul style="list-style-type: none"> Develop necessary infrastructure facilities for waste management, e.g., solid waste collection and treatment, and waste water treatment, in the transition zone. 	Implementation plan of EPS
5.3	Classification of domestic waste at source (3Rs)	<ul style="list-style-type: none"> Develop and promote 3Rs (Reduction, Reuse and Recycle) models in the buffer and transition zones 	Implementation plan of EPS
5.4	Waste management model (eco-toilets, biogas, compost, etc.)	<ul style="list-style-type: none"> Promote waste management models, such as eco-toilets, biogas, compost, etc., to reduce and reuse domestic wastes in the buffer and transition zones. 	Implementation plan of EPS
6	Environmental Education and Communication program		
6.1	Development of a communication strategy on biosphere reserve values	<ul style="list-style-type: none"> Develop and implement the strategy and action plans to enhance communication among stakeholders and increase social awareness on the values of the biosphere reserve. 	Implementation plan of EPS, BCP
6.2	Building and operation of the website and social network of the biosphere reserve	<ul style="list-style-type: none"> Build, operate, and manage the website and social network medium of the biosphere reserve for enhancement of public awareness of the values of the biosphere reserve. 	-
6.3	Environmental education	<ul style="list-style-type: none"> Develop and implement an environmental education plan to raise public awareness of environmental protection, biodiversity conservation, and biosphere reserve. Construct/upgrade the environmental education center of Bidoup- Nui Ba NP. 	Implementation plan of EPS, BCP
7	Scientific Research program		
7.1	Development of scientific research topics	<ul style="list-style-type: none"> Develop an action plan for scientific researches in cooperation with national and international research institutes, universities, and scientific organizations to further study biodiversity and indigenous culture. 	BCP
7.2	Coordination with the implementation of scientific researches	<ul style="list-style-type: none"> Conduct scientific researches in cooperation with the relevant institutes/universities/organizations, such as i) introduction and utilization of remote sensing data for management and monitoring of forest ecosystems and ii) integration of natural and cultural conservation. 	BCP
7.3	Application and transferring of sciences and technologies	<ul style="list-style-type: none"> Apply new and advanced technologies and science for improving the management of the biosphere reserve and making local economic activities more sustainable and effective. Implement the upland rural development project. 	BCP

No	Sub-programs/activities	Outline of the Sub-programs/Activities	Related to plans <1
8	Operation and M & E Program		
8.1	Operation and Monitoring of the implementation of activities	<ul style="list-style-type: none"> Operate LBWBR-MB to fulfill its managerial tasks and maintain the assets necessary for management of the biosphere reserve. Regularly monitor the progress of the activities to be carried out by the stakeholders (provincial departments, PCs, and private sectors) in the framework of the management plan 	-
8.2	Evaluation according to the requirements of the biosphere reserve	<ul style="list-style-type: none"> Assess and evaluate the results of the sub-programs carried out by the stakeholders on an annual basis and extract useful lessons from the evaluation. 	-
8.3	Biodiversity monitoring	<ul style="list-style-type: none"> Conduct the biodiversity monitoring periodically in the core zone of the biosphere reserve to confirm the status of biological diversity in the ecosystems and identify any sign of its changes. 	-
8.4	Development of investment project (2020-2025) for the BR and expansion of the BR in the future	<ul style="list-style-type: none"> Develop a five-year investment plan for management of the biosphere reserve from 2020 to 2025 based on the results of the evaluation of the sub-programs. Develop a plan or proposal as well as the associated necessary documents for expansion of LBWBR. 	-
9	International Cooperation program		
9.1	Cooperation with MAB-UNESCO.	<ul style="list-style-type: none"> Communicate with MAB-UNESCO on a regular basis. 	-
9.2	Cooperation with the biosphere reserve network in the world.	<ul style="list-style-type: none"> Coordinate and communicate with other biosphere reserves in the world. 	-
9.3	International cooperation in scientific research in the biosphere reserve.	<ul style="list-style-type: none"> Cooperate and coordinate with research institutes and universities, international organizations for scientific researches. 	BCP

7.3 Priority sub-programs

Out of the 36 sub-programs/activities proposed and 9 programs, the following 20 sub-programs are selected as priority ones, which should be emphasized and preferentially implemented in the course of the implementation of the management plan.

Criteria for identifying priority sub-programs are:

- (1) Be as a part of the sustainable development program of Lam Dong Province to meet sustainable development goal of Vietnam until 2230;
- (2) Meet the management objectives of the BR;
- (3) Under proposals of stakeholders in the consultation process;
- (4) Be in line with the functions and duties of the Management Board;
- (5) Be able to mobilize financial resources for implementation.

Table 9. Priority sub-programs/activities in the management plan of LBWBR

1. Natural Resource Conservation program

- 1.1. Protection of forest resources
- 1.3. Planning for conservation and sustainable development of the BR
- 1.5. Building of botanical gardens and animals parks
- 1.6. Development of the collaborative management model for natural resource management

2. Program for Preserving Cultural Values

- 2.1. Proposed intergration mechanism of cultural and natural conservation

3. Program for Support in Environmentally-friendly Economic Development

- 3.1. Payment for forest environment services
- 3.2. Building and development of BR brand
- 3.3. Promotion of public-private partnership in biosphere reserves
- 3.5. Development of sustainable livelihood models

4. Responsible Tourism Development program

- 4.1. Development of tourism promotion strategies
- 4.2. Development of agricultural tourism models
- 4.3. Development of community tourism models

6. Environmental Education and Communication program

- 6.1. Development of a communication strategy on biosphere reserve values
- 6.2. Building and operation of the website and social network of the biosphere reserve
- 6.3. Organization of environmental education activities

7. Scientific Research program

- 7.1. Development and proposal of scientific research topics
- 7.2. Coordination with the implementation of scientific researches
- 7.3. Application and transferring of sciences and technologies

8. Operation and M & E program

- 8.1. Monitoring of the implementation of the management plan
- 8.2. Biodiversity monitoring
- 8.4. Development of a scientific investment project for expanding the BR

9. International Cooperation program

- 9.1. Cooperation with MAB-UNESCO
- 9.2. Cooperation with the biosphere reserve network in the world
- 9.3. International cooperation in scientific research in the biosphere reserve

7.4 Institutional Framework for Implementation of the Management Plan

7.4.1 Overall Management Framework for Langbiang World Biosphere Reserve

The LBWBR Management Plan will be implemented by all stakeholders from the five main groups, namely: Managerial organizations (including specialized agencies and local authorities at all levels), governmental functional organizations (public non-business organizations) (governmental forest owners), science academic organizations (national and international educational, research institutes), business, and community and civil society, under the direct management and guidance of the Lam Dong PPC. LBWBR MB is composed of nine (9) members from different departments/organizations under the leadership of Vice Chairperson of the Lam Dong PPC. The MB will play important roles in the implementation of the management plan, particularly in coordinating and integrating the sub-programs relating to the relevant stakeholders. The following figure illustrates the institutional framework for implementation of the management plan.

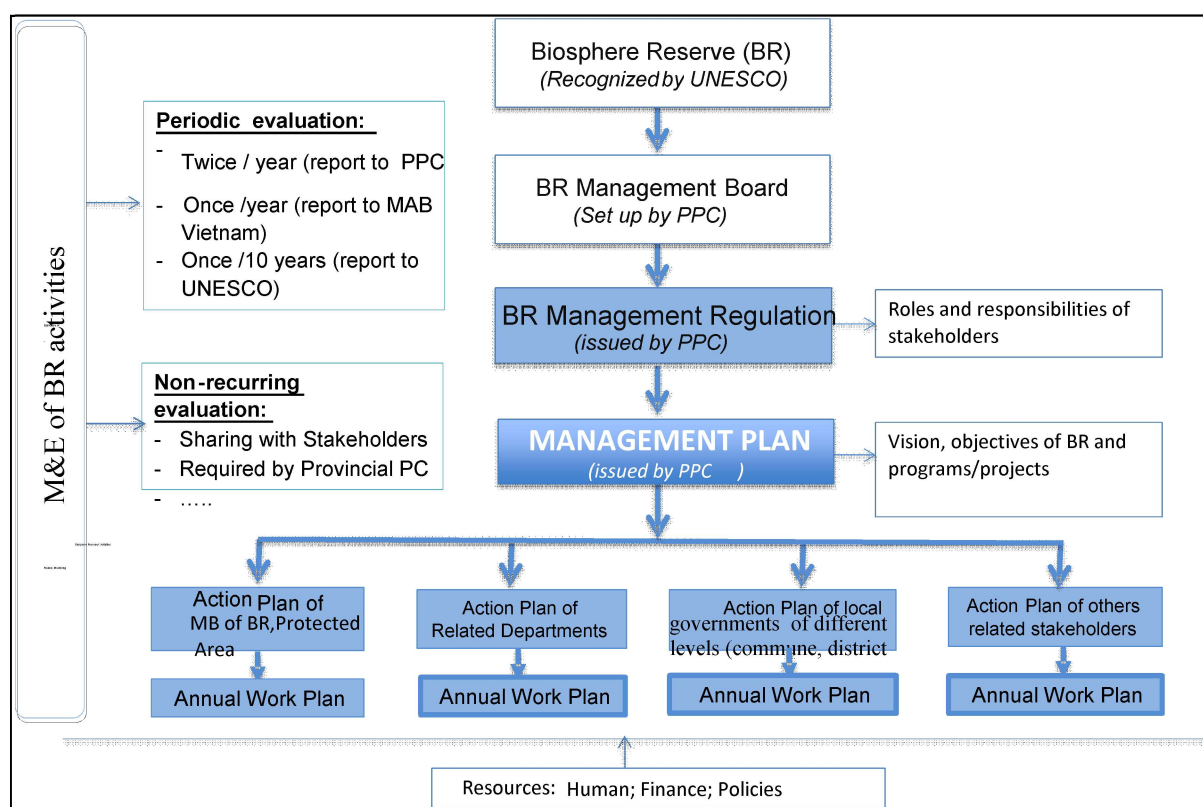


Figure 9. Proposed management framework for the Langbiang Biosphere Reserve

7.4.2 Lang Biang World Biosphere Reserve Management Board

The Langbiang World Biosphere Reserve Management Board was established on June 3, 2016 by PPC Decision No. 1164 /QĐ –UBND. The Management Board is a multisectoral organization composed of representatives from eight (8) different government organizations as shown below.

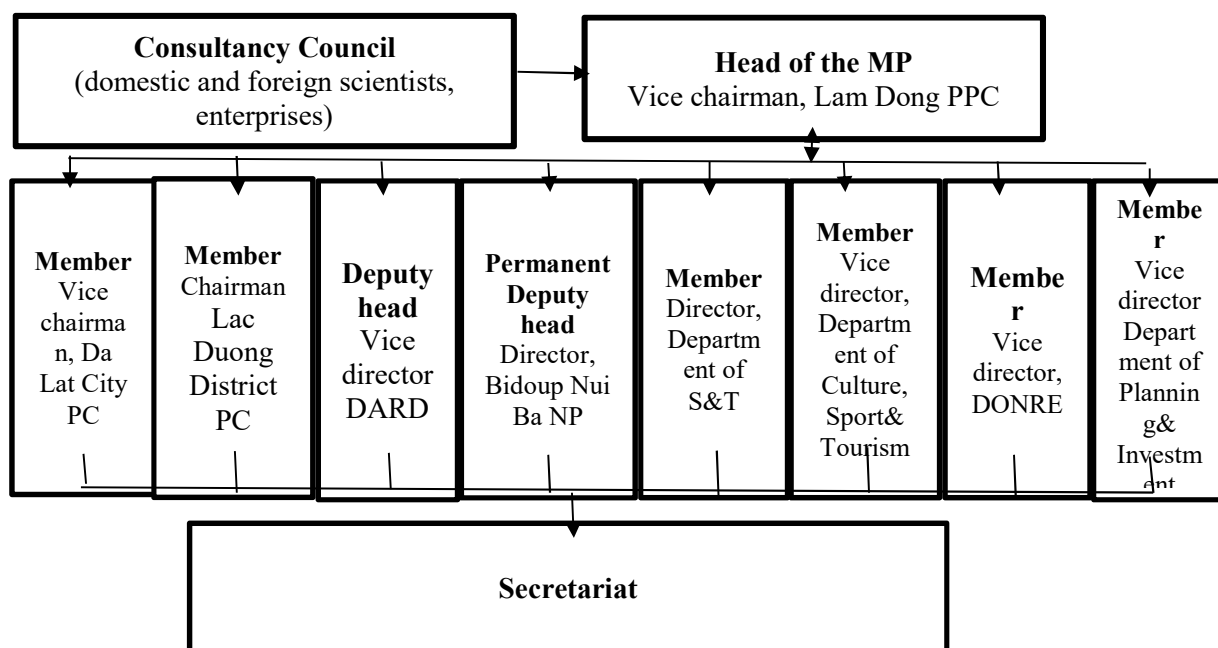


Figure 10. Management structure for LBDR MB

Functions and responsibilities of LBWBR-MB, which are defined by Decision No. 1164/QĐ-UBND, are shown below.

Table 10. Functions and responsibilities of LBWBR Management Board

Item	Description
Function	LBWBR MB is a standing body to support Lam Dong PPC to implement the operation of LBWBR followed by Vietnamese regulations and by technical support from Vietnam National Commission for UNESCO (UNESCO Vietnam) and MAB Vietnam.
Responsibilities	<ul style="list-style-type: none"> • To prepare the management plan for the operation of LBWBR in consultation with UNESCO Vietnam, MAB Vietnam and then submit it to Lam Dong PPC for approval and enforcement; • To conduct and implement plans and planning, programs, projects with approval from competent organization for the conservation and sustainable development of the LBW BR; • To organize a collaborative management platform for stakeholders to join the conservation, management and sustainable development of LBWBR; • To advise Lam Dong PPC about the establishment of the International Consultant Council for the conservation and sustainable development of LBWBR and to be the organization in charge of the operation of the Council under the laws of Vietnam; • To mobilize and access to international and national resources for the implementation of programs, projects, activities for the conservation and sustainable development of LBW BR followed by current laws and regulations; • To implement awareness raising, educational, promotion programs to promote the

Item	Description
	<p>LBWBR;</p> <ul style="list-style-type: none"> • To propose scientific research, cooperation and collaboration with international and national organizations; to receive research outcome made for the LBWBR; • To act as a focal point to contact with UNESCO Vietnam, MAB Vietnam to accept and implement LBWBR-related activities; to join the world network of biosphere reserves to strengthen the cooperation with international and national scientists under MAB/ UNESCO network; • To manage, utilize materials, properties and financial resources from relevant sources to operate the LBWBR;

7.4.3 Major Functions and Tasks of the Relevant Stakeholders

The relevant stakeholders are responsible for the implementation of the management plan, especially the sub-programs related to the relevant sectors and localities. The general roles and responsibilities given to each department/agency/organization are proposed as follows:

(1) Lam Dong Provincial People's Committee

- Directly manage and instruct activities of LBWBR-MB (Vice Chairperson of Lam Dong PPC is the head of the LBWBR-MB);
- Decide and issue a legal framework to support the LBWBR MB in the implementation of activities within the framework of the management plan;
- Approve the five-year management plan of LBWBR; and
- Allocate necessary budgets for implementation of the sub-programs of the relevant departments/agencies which are programmed in the five-year management plan.

(2) Bidoup-Nui Ba National Park Management Board

- Director of the NP is permanent deputy head of the LBWBR responsible for supporting the vice chairman of Lam Dong PPC to perform his/her role as the head of LBWBR MB;
- Organize operation of the Secretariat of the LBWBR MB, specifically: i) assistance in the implementation of the sub-programs of the relevant departments/organizations, ii) facilitation in the coordination and integration of the sub- programs of the relevant departments/organizations, and iii) facilitation in the communications among the members of LBWBR-MB, especially between the head of the LBWBR-MB and other members;
- Integrate the programs/sub-programs of LBWBR into those of Bidoup-Nui Ba NP-MB;
- Facilitate the Secretariat in coordinating collaborative management platform of LBWBR;
- Take part in collaborative management platform of LBWBR

(3) Departments at Provincial Level (Departments of Agriculture and Rural Development, Planning&Investment, Finance, Natural Resources & Environment, Culture, Sport & Tourism, Science & Technology, Education & Training ...)

- Support LBWBR MB to implement the management plan of LBWBR based on the assigned functions and tasks in Decision No: 1164 /QD –UBND;
- Integrate the sub-programs of the LBWBR management plan related to the respective departments into the operation programs of the departments and be responsible for implementation of the sub-programs relating to the respective departments;
- Coordinate with/support LBWBR MB to organize the implementation of the sub-programs in the management plan of LBWBR;
- Report the progress and results of the implementation of the sub-programs to LBWBR-MB.
- Send staff to the platform for collaborative management of LBWBR

(4) Forest Management Boards/Forestry company in the BR

- Coordinate its activities with LBWBR-MB and other relevant departments for implementation of the programs/sub-programs proposed in the management plan, particularly i) Protection of forest resources, ii) Payment for forest environmental services, iii) Forest fire prevention, and iv) Development of the collaborative management model for natural resource management under the Nature Conservation program;
- Integrate the sub-programs related to management of forests under its jurisdiction;
- Be responsible for implementation of the sub-programs related to management of forests under its management;
- Develop an work plan for the programs/sub-programs of the BR according to regulations of units/agencies; and
- Join in collaborative management platform of LBWBR

(5) District People's Committees in LBWBR

- Support LBWBR MB to implement the sub-programs/programs of LBWBR in the respective jurisdictional areas of districts based on the assigned functions and tasks in Decision No: 1164 /QD –UBND;
- Integrate the management objectives, sub-programs of LBWBR into local socio-economic development programs for implementation;
- Coordinate with LBWBR MB to organize the implementation of the sub-programs in the management plan of LBWBR;
- Participate in the implementation of sub-programs of the BR in the district jurisdictional areas; and

- Report the progress and results of the implementation of the sub-programs implemented in its jurisdictional areas in the meetings of LBWBR-MB.
- Send staff to the forum/platform of collaborative management of LBWBR

(6) Organizations and individuals engaged in science and technology activities

Forest Science Institute of South Central and Central Highland, research institutes, universities, colleges ...participate in protection and development of LBWBR through the activities:

- Propose and implement research projects in LBWBR
- Participate in planning, implementation, and reviews of the sub-programs/programs set in the management plan;
- Provide advice, comments, and any proposal for better management of LBWBR and proper implementation of the management plan;
- Coordinate with LBWBR-MB and the forest owners, especially Bidoup- Nui Ba NP-MB, to conduct researches in the relevant fields; and
- Share the results of researches and studies with LBWBR-MB and the forest owners, especially Bidoup- Nui Ba NP-MB for improvement of its management of LBWBR, such as development of database, improvement of management programs based on scientific arguments, and development of a management tool/model.
- Proactively participate in the forum/platform for Langbiang Biosphere Reserve Collaborative management

(7) Businesses in LBWBR

- Be entitled to enjoy benefits from engagement in production and/or business activities that exploit and use natural resources in LBWBR within the rights and benefits prescribed by law;
- Participate in discussions and consultations with the relevant provincial departments/agencies about the management plan of LBWBR.
- Cooperate with LBWBR-MB and relevant departments/agencies in the implementation of the sub-programs related to the respective business fields.

(8) Local community living in LBWBR

- Provide suggestions for planning of biodiversity conservation and preservation of cultural heritage of the BR;
- Participate in public awareness raising activities and environmental education;
- Join the forest protection contract with the forest owners
- Be responsible for forest protection as counterparts in the framework of collaborative management of valuable forest ecosystems in LBWBR;
- Enjoy benefits from protecting, developing and promoting the value of the BR;

- Proactively make suggestions and comments to LBWBR MB and related parties (feedback on the management plan, suggest or promptly report problems occurring locally); and
- Participate in development of sustainable livelihood improvement models and community-based ecotourism models and help the relevant departments/agencies promote the same activities.
- Encourage the community to send representatives to the LBWBR management forum/platform

7.4.4 Responsibilities of stakeholders for Implementation of the Sub-programs/Activities of the Management Plan

The sub-programs will be carried out by the relevant departments/agencies/organizations as shown below.

Table 11. Responsibilities of stakeholders in implementing the operational programs of the management plan

#	Operational programs	Implementation arrangement	
		Responsible organization	Supporting organization
1	Natural Resources Conservation program		
1.1	Protection of forest resources	DARD, City PC, DPCs, forest owners	related stakeholders
1.2	Forest fire prevention	DARD, City PC, DPCs, CPCs, forest owners, community	related stakeholders
1.3	Planning for conservation and sustainable development of LBWBR	LBWBR MB	related stakeholders
1.4	Biodiversity conservation	DARD, DONRE, Bidoup-Nui Ba NP, forest owners, community	Related stakeholders
1.5	Building of botanical gardens and animals parks.	Bidoup-Nui Ba NP	LBWBR MB, and relevant departments/sectors
1.6	Development of the collaborative management model for natural resources management	Bidoup- Nui Ba NP, LBWBR MB	related stakeholders
2	Program for Preserving Cultural Values		
2.1	Proposed mechanism for combined natural and cultural conservation	Department of Culture, Sports & Tourism, LBWBR MB	Related stakeholders
2.2	Preservation of indigenous knowledge and traditional festivals	Department of Culture, Sports & Tourism, City PC, District PCs (DPCs)	LBWBR MB, and related stakeholders
2.3	Preservation of gong culture	Department of Culture, Sports & Tourism, DPCs	LBWBR MB, and related stakeholders

#	Operational programs	Implementation arrangement	
		Responsible organization	Supporting organization
2.4	Restoration of traditional handicrafts	Department of Culture, Sports & Tourism, DPCs	LBWBR MB, and related stakeholders
2.5	Construction of the Museum of Central Highlands nature and culture	Department of Science and Technology	LBWBR MB, and related stakeholders
3	Program for Support for Environmentally-friendly Economic Development		
3.1	Payment for Forest Environment Services	DARD, forest owners	Related stakeholders
3.2	Development of LBWBR brand	Bidoup-Nui Ba NP and LBWBR MB	Related stakeholders
3.3	Promotion of public-private partnership in LBWBR	Departments/Divisions/Sectors/ Provincial Centre for Tourism and Investment Promotion, Bidoup-Nui Ba NP	LBWBR MB, and related stakeholders
3.4	Green growth, ecological village, green urban area	Da Lat City People's Committee, DPCs	Related stakeholders
3.5	Development of sustainable livelihood models	LBWBR MB, Bidoup-Nui Ba NP, DPCs	Related stakeholders
4	Tourism Development program		
4.1	Development of tourism promotion strategies	Department of Culture, Sports & Tourism, Provincial Centre for Tourism and Investment Promotion	LBWBR MB, and related stakeholders
4.2	Development of agricultural tourism models	Department of Culture, Sports & Tourism/City PC, DPCs	LBWBR MB, and related stakeholders
4.3	Development of community tourism models	Department of Culture, Sports & Tourism/City PC, DPCs, Bidoup-Nui Ba NP, businesses	LBWBR MB, and related stakeholders
5	Environmental Pollution Reduction program		
5.1	Monitoring and evaluation of environmental quality	DONRE	LBWBR MB, and related stakeholders
5.2	Waste management (solid, waste water)	DONRE	LBWBR MB, and related stakeholders
5.3	Classification of domestic waste at source (3Rs)	DONRE	LBWBR MB, and related stakeholders
5.4	Waste management model (eco-toilets, biogas, compost,)	DONRE	LBWBR MB, and related stakeholders
6	Environmental Education and Communication program		
6.1	Development of a communication strategy on LBWBR values	Department of Culture, Sports & Tourism, LBWBR	Related stakeholders

#	Operational programs	Implementation arrangement	
		Responsible organization	Supporting organization
		MB	
6.2	Building and operation of the website and social network of the biosphere reserve	LBWBR MB	Related stakeholders
6.3	Environmental education	LBWBR MB, Bidoup-Nui Ba NP, DONRE	Related stakeholders
7	Scientific Research program		
7.1	Development of scientific research topics	Department of Science& Technology, research agencies, LBWBR MB, Bidoup-Nui Ba NP	Related stakeholders
7.2	Coordination with the implementation of scientific researches	LBWBR MB, research agencies	Related stakeholders
7.3	Application and transferring of sciences and technologies	Department of Science&Technology, LBWBR MB, research agencies	Related stakeholders
8	Operations and M & E program		
8.1	Monitoring of the implementation of the management plan	LBWBR MB, departments/divisions, DPCs	Related stakeholders
8.2	Biodiversity monitoring	DONRE, DARD, LBWBR MB, Bidoup- Nui Ba NP,	Related stakeholders
8.3	Evaluation requested by BRs	LBWBR MB, Bidoup- Nui Ba NP	Related stakeholders
8.4	Building of a five-year investment project (2020-2025) and plan for expansion of the BR	LBWBR MB	Related stakeholders
9	International Cooperation program		
9.1	Cooperation with MAB-UNESCO	LBWBR MB	Related stakeholders
9.2	Cooperation with the biosphere reserve network in the world.	LBWBR MB	Related stakeholders
9.3	International cooperation in scientific research in the biosphere reserve.	LBWBR MB/research agencies	Related stakeholders

7.5 Necessary Arrangements for Implementation

After approval of the management plan by the Lam Dong PPC, it should be publicized and disseminated to relevant local stakeholders including local communities in the biosphere reserve. Based on the objectives and content of the management plan, LBWBR MB will play a coordination role and cooperate with stakeholders to implement the plan.

For systemic, efficient and effective implementation of the management plan, it is necessary for LBWBR-MB and the relevant departments/agencies to jointly take the following actions in the course of the implementation of the management plan.

After the approval of the management plan

- Based on the LBWBR management plan (MP), the relevant departments/agencies/localities should develop operation plans for the implementation of the MP under their jurisdictions/responsibilities and arrange the implementation;
- The relevant departments/agencies should share the annual operation plans with LBWBR-MB so that LBWBR-MB could consolidate the annual operations plans into one master plan; and
- LBWBR-MB should agree with/comment on the annual operation plans for the plans to be sent to the Lam Dong PPC for approval.

1st Year after the approval of the annual operation plans/the master plan

- LBWBR-MB and the relevant departments/agencies should try to mobilize resources for implementation of the annual operation plans;
- LBWBR-MB and the relevant departments/agencies should implement the annual operation plans.
- LBWBR-MB and the relevant departments/agencies should monitor the progress, results, and accomplishments of the respective annual operation plans in the regular meetings of LBWBR-MB;
- LBWBR-MB and the relevant departments/agencies should report and share any difficulties and issues they face in the implementation of the respective annual operation plans in the regular meetings of LBWBR-MB;
- LBWBR-MB and the relevant departments/agencies should discuss and deliberate measures and means to address difficulties/issues in the regular meetings of LBWBR-MB;
- LBWBR-MB should help the relevant departments/agencies develop annual operation plans.

Period from the 2nd to 5th year

- Repeat the activities carried out in the 1st year in a collaborative manner.

In addition to the activities listed above, LBWBR-MB should: i) propose programs and projects on scientific researches, ii) communicate with the education sector as well as the private sector for promotion of environmental education, iii) cooperate with national and international organizations for further supports, iv) communicate and coordinate with the relevant ministries and central agencies to strengthen the networks, and v) exchange ideas and opinions with local communities as well as other stakeholders on the management of LBWBR.

8 BUDGET ESTIMATES FOR IMPLEMENTATION OF THE MANAGEMENT PLAN

8.1 Pre-conditions of Budget Estimates

As this management plan is developed on the basis of the existing master plans, e.g., Provincial Socio-Economic Development Plan, Action Plan for the Sustainable Development Strategy, Implementation plan of the National Environmental Protection Strategy, and Provincial Biodiversity Conservation Master Plan, the significant parts of the sub-programs and the associated activities have already been programmed into the existing master plans as well as annual operation plans of the relevant departments and organizations.

In order to avoid duplication of budget allocation to similar activities, this management plan indicates the estimated budgets only for the sub-programs and activities which have not been programmed in the existing plans of the relevant departments and agencies. The estimation is only based on projects which have been arranged to be financed from budgets or may be financed from budgets and other sources. Other prioritized activities without possibility of getting financial support are not included.

8.2 Budget needs for programs / projects for the period 2018-2022

LBWBR is a large-sized, multi-sector and diversified biosphere reserve, which means that the budgets allocated to it are likely to be raised and not restricted by the estimates shown in the below table depending on the government's possible budgets and other financial sources.

The cost of implementing sub-programs/activities newly required for implementation of the management plan for the period 2018-2022 is estimated at about VND 48.9 billion, of which 55% is from the state budget and 41% is from other sources. The breakdown of the cost estimates is shown below.

Table 12. Budget estimates for activities included in the Management Plan 2018-2022

No.	Activities / Sub-programmes	Financial sources (million VND)			Note
		Total	Governm ent's budget	Others	
1	Natural resource conservation program				
1.2	Planning for conservation and sustainable development of LBWBR	5,000	5,000		The MB of LBWBR has asked the Ministry of Finance and the Provincial Department of Finance to finance the activity and has got approval from the Ministry of Finance. However, the activity has been postponed waiting for a law on planning.

1.6	Developing the collaborative management model for natural resources management	1,500		1,500	The project of sustainable natural resources management (SNRM) – phase 3 has been financed and in progress.
2	Conservation of cultural values				
2.1	Proposing a combination of natural and cultural conservation	200	200		The project titled “Research on establishing a mechanism of combined conversation of landscapes-biodiversity and cultural values in LBWBR” coded ĐTĐL.XH.11/15 MST is in progress.
3	Program for Support for Environmentally-Friendly Economic Development				
3.2	Developing and implementing marketing strategies for the brand of LBWBR	2,000		2,000	The project of sustainable natural resources management (SNRM) – phase 3 has been financed by MST and the public.
3.5	Developing sustainable livelihood models	4,000	3,000	1,000	It has been combined with other ongoing relevant projects implemented by the DARD with part of its finance received from the public.
4	Responsible tourism development program				
4.1	Developing strategies for promoting tourism	2,000	2,000		It has been combined with other activities initiated by the Department of Culture, Sports and Tourism; being done by the Investment Promotion Center.
4.2	Developing agricultural tourism models	2,000	2,000		It has been combined with projects initiated by the People’s Committee of the city and done by the DCST.
4.3	Developing community tourism models	4,000		4,000	The project of community-based management capacity building and the project of SNRM – phase 3 sponsored by JICA.
6	Environmental education and communication program				
6.1	Developing strategies for communicating biosphere reserve values	2,500	1,500	1,000	The project of SNRM, combined with activities initiated by DCST and the Tourism Promotion Center of the province

6.2	Developing and administering of the LBWBR website and social network page	100	100		Requested to be financed from the province's public budget
6.3	Conducting environmental education activities				
6.3.1	Conduct of environmental education activities	2,500	1,500	1,000	The project of SNRM and the province's environmental fund
6.3.2	Constructing and upgrading the environmental education center for LBWBR	2,000	1,000	1,000	The project of SNRM and the province's environmental fund
7	Scientific research program				
7.2	Coordinating and implementing scientific research				
7.2.1	Developing and applying the remote sensing for NRM	1,000	1,000		Financed from the province's scientific fund, in progress. The contract for the implementation of the scientific and technological research project No 25/HD-SKHCN signed on June 23, 2017 between Lam Dong Department of Science and Technology and Rainforest Research Center - Bidoup Nui Ba National Park
7.2.2	Integrating nature and cultural conservation	5,000	5,000		Ministry of Science and Technology, project DTDL.XH.11/15 by the Southern Institute of Ecology
7.3	Applying and transferring scientific and technological advances				
	Developing and implementing the upland rural project	6,000	3,000	3,000	Decision No. 2480/QD-BKHCN dated 14 th October 2017 approving the requested list of projects under the rural mountainous program, authorizing local management has been effective since 2018. It has been financed from the province's scientific fund, payments for forest environment services of Bidoup-Nui Ba National Park and the community.

8	Monitoring and evaluation program				
8.1	Monitoring the implementation of the management plan				
	Maintaining the operation of the MB of LBWBR	2,500	2,500		Requested to be financed from the province's public budget
8.2	Monitoring biodiversity in LBWBR	2,500		2,500	The project of SNRM – phase 3 sponsored by JICA
8.4	Developing an investment and expansion plan for LBWBR				
8.4.1	Developing a mid-term investment plan for LBWBR	500	500		Requested to be financed from the province's public budget in compliance with the Law on Investment
8.4.2	Developing an expansion plan for LBWBR	3,000		3,000	The project of SNRM – phase 3 sponsored by JICA
9	International cooperation programme				
9.1	Cooperating with MAB/UNESCO	600	600		Requested to be financed from the province's public budget
Total		48,900	28,900	20,000	

Note:

(1) Central budget: VND 11.7 billion, accounting for 24%. It is the budget allocated by MST for approved projects.

(2) Local budget: VND 17.2 billion, accounting for 35%

(3) ODA capital: VND 16.0 billion, accounting for 33%. Under the Sustainable Natural Resource Management Project funded by the Government of Japan in Decision No. 4713/QĐ-BNN-HTQT dated 15th November 2006 of MARD

(4) Other financial sources: VND 4 billion, accounting for 8%, expected to be funded by the stakeholders

Since the investment and construction project for LBWBR has not been prepared and approved, the MB of LBWBR has not proposed funding from the investment and development fund under the public investment law for the period 2017-2020.

8.3 Principles for financial management of the operational programs of the biosphere reserve

- 1) The relevant sectors and local authorities shall develop and propose plans of the sub-programs and the associated projects to the Lam Dong PPC for allocation of funds for implementation based on functions and tasks described in section 7.4 of this management plan.
- 2) The financial resources allocated for the activities carried out by LBWBR-MB shall be managed in accordance with the current regulations of the State.
- 3) The financial resources of support from ODA projects and programs are managed in accordance with current regulations of the Vietnamese government or donor agreements.
- 4) The financial resource of support from organizations and individuals for LBWBR-MB shall be spent exclusively for the activities of the biosphere reserve and managed according to the regulations of the State or at the request of organizations and individuals;
- 5) The provincial budget shall be used for operations of the activities of LBWBR MB. LBWBR-MB shall elaborate the operation plan and budget based on the approved management plan and send it to the provincial/municipal finance services for evaluation. The annual operation plan and budget will be submitted to the Lam Dong PPC for consideration and approval according to the provisions of the State Budget Law.

8.4 Implementation

Table 13. Plan for implementation of priority activities

No.	Activities / Programmes	Year of implementation				
		2017	2018	2019	2020	2021
1	Natural conservation conservation program					
1.2	Planning for conservation and sustainable development of LBWBR					
1.6	Developing the collaborative management model for natural resources management					
2	Conservation of cultural values					
2.1	Proposing a combination of natural and cultural conservation					
3	Program for Support for Environmentally-Friendly Economic Development					
3.1	Developing the brand of LBWBR					
3.2	Developing and implementing marketing strategies with the brand of LBWBR					

No.	Activities / Programmes	Year of implementation				
		2017	2018	2019	2020	2021
3.5	Developing sustainable livelihood models					
4	Responsible tourism development program					
4.1	Developing strategies for promoting tourism					
4.2	Developing agricultural tourism models					
4.3	Developing community tourism models					
6	Environmental education and communication program					
6.1	Developing strategies for communicating biosphere reserve values					
6.2	Developing and administering of the LBWBR website and social network page					
6.3	Conducting environmental education activities					
	Conduct of environmental education activities					
	Constructing and upgrading the environmental education center for LBWBR					
7	Scientific research program					
7.2	Coordinating and implementing scientific research					
	Developing and applying the remote sensing for NRM					
	Integrating nature and cultural conservation					
7.3	Applying and transferring scientific and technological advances					
	Developing and implementing the upland rural project					
8	Monitoring and evaluation program					
8.1	Monitoring the implementation of the management plan					
	Maintaining the operation of the MB of LBWBR					
8.2	Monitoring biodiversity in LBWBR					
8.4	Developing an investment and expansion plan for LBWBR					

No.	Activities / Programmes	Year of implementation				
		2017	2018	2019	2020	2021
8.5	Developing a mid-term investment plan for LBWBR					
8.6	Developing an expansion plan for LBWBR					
9	International cooperation programme					
9.1	Cooperating with MAB/UNESCO					

9 MONITORING AND EVALUATION PLAN

The monitoring and evaluation plan is composed of three (3) parts: i) monitoring of the implementation of the management plan, ii) evaluation of the results and impacts of the management plan, and iii) monitoring of any changes in the functions of the biosphere reserve, and. Hence, the main objectives of the monitoring and evaluation plan are: i) to systematically manage the implementation of the management plan and strategically use resources for achievement of goal and objectives of the management plan, ii) to assess the project impact adequately and extract lessons useful for development of the next 5-year management plan, iii) to figure out necessary actions for maintaining the values of the biosphere reserve, and iv) to assess any changes in biological, environmental and social values and functions of the biosphere reserve.

9.1 Monitoring of the Implementation of the Management Plan

9.1.1 Regular Monitoring

The implementation of the management plan shall be regularly monitored by LBWBR-MB in collaboration with relevant departments and agencies in the Lam Dong Province pursuant to the Public Investment Law (No. No. 49/2014/QH13). The focus of the regular monitoring will be placed on the following points:

- Progress and results of the sub-programs planned in the management plan
- Any negative environmental and social impacts caused by the project activities
- Any difficulties faced in the implementation of the sub-programs
- Recommendations

LBWBR-MB shall collect the monitoring data in collaboration with relevant departments and agencies using the monitoring format given in Appendix-xx attached to this management plan. The results of the regular monitoring shall be reported in the regular meeting of LBWBR-MB so that any necessary actions to be taken for addressing such difficulties could be discussed among the members of LBWBR-MB.

9.1.2 Annual Monitoring

The annual monitoring mainly aims to monitor i) physical accomplishments of the management plan, ii) financial expenditures made by the relevant departments and agencies for implementation of the sub-programs, iii) progress of milestones of the activities listed in Section 6.2.3, and iv) issues to be addressed in the implementation of the management plan.

Likewise, LBWBR-MB shall collect the monitoring data in collaboration with relevant departments and agencies using the monitoring format given in Appendix-xx attached to this management plan. The results of the annual monitoring shall be reported in the annual meeting of LBWBR-MB so that LBWBR-MB together with the relevant departments/agencies could review and develop the respective annual operation plans for the following year based on the results of the annual monitoring.

9.2 Evaluation of the Results and Impacts of the Management Plan

The results of the management plan along with the level of accomplishment of the specific objectives shall be reviewed and evaluated in the middle and end of the management plan. The main objectives of the mid-term and final valuation are:

Mid-term evaluation:

- to verify if the management plan has been implemented on the right track to achieve its goal and specific objectives in an efficient and effective manner;
- to determine any difficulties and issues in the implementation of the management plan; and
- to figure out possible solutions for improvement of the management plan.

Final evaluation:

- to evaluate the framework and designs of the management plan, process of implementation, performances of the stakeholders, level of achievement of the goal and objectives of the plan, and efficiency in using the resources;
- to evaluate the benefits and potential impacts to be generated by the programs/sub-programs and the sustainability of the effectiveness of the programs/sub-programs; and
- to extract lessons learned and deliver recommendations to the next five year management plan.

The major activities to be carried out in the mid-term and final evaluations are summarized below.

- i) Analysis of the progress and accomplishments of the management plan
- ii) Evaluation of the achievement level of the specific objectives of the management plan
- iii) Evaluation of potential impact (positive and negative) on forest ecosystems/biodiversity, local livelihood, environment, regional economy, and scientific researches/education

- iv) Difficulties and issues in the implementation of the management plan
- v) Necessary actions for improvement of the management plan (only for Mid-term evaluation)
- vi) Recommendations to the next five-year management plan (only for Final evaluation)

Some data and information necessary for the evaluations, such as the progress and accomplishments of the management plan, can be collected from reviews of the results of regular and annual monitoring made by LBWBR-MB and interviews to the relevant departments and agencies. Nevertheless, the further analyses and surveys listed below may be needed for collection of data on the achievement level and potential impacts.

Analysis of the latest remotesensing data covering the biosphere reserve to assess the changes in forest cover and forest ecosystems in the biosphere reserve

- Questionnaire survey to assess the changes in household income of local communities after implementation of the sub-programs
- Interview survey to assess the additional benefits generated by the sub-programs of the management plan, especially those under the Program for Support for Environmentally-friendly Economic Development and Tourism Development Program.
- Water quality analysis in the major rivers

9.3 Monitoring of the Functions of the Biosphere Reserve

In addition to the monitoring and evaluation of the management plan, LBWBR-MB shall regularly monitor and assess whether or not the biosphere reserve still maintains its values and functions as it had when being recognized by UNESCO MAB. Although the official review shall be carried out every 10 years to comply with the requirement of UNESCO MAB. It is advisable to check the status of the biosphere reserve more frequently so that necessary action could be taken for maintenance of its values and functions of the biosphere reserve before they change to the irretrievable level. The seven (7) criteria set by UNESCO MAB can be used for monitoring of the status of the biosphere reserve.

One of the tools that LBWBR-MB could use for regular monitoring of the status of the biosphere reserve, especially core and buffer zones, is METT (Management Effectiveness Tracking Tool) for the protected area, which was developed by WWF/World Bank Alliance for Forest Conservation and Sustainable Use since in 2002. This toolkit has been kept updated throughout continuous use in many nature reserves around the world. METT consists of 2 parts, evaluation forms and guidebooks. In 2007, the form was updated by WWF and its user handbooks were revised in 2016 (Stolton and Dudley, 2016). Annex 4 shows the updated form of METT.

The METT was used to assess the management effectiveness of the Bidoup-Nui Ba natural reserve (predecessor of Bidoup-Nui Ba National Park) in 2003, and 10 years later the tool was reused to evaluate the effectiveness of management for Bidoup-Nui Ba National Park.

As the tool has been used for monitoring of the national park, which cover the core and part of the buffer zone of the biosphere reserve, it would be easy and practical for the key stakeholders, such as BNNP-MB, to continuously use the same form for monitoring of the biosphere reserve.

APPENDIXES

Appendix 1. Analysis of difficulties, challenges, causes and solutions to LBWBR

No.	Difficulties / challenges	Causes	Solutions
1	Extension of agricultural land: unsanctioned sale of agricultural land, illegal clearance leading to encroachment on natural ecosystems.	<ul style="list-style-type: none"> - Demand for production land: afforestation for production, tourism, rice cultivation, etc. - Increased production values of agricultural land: Kinh people have bought land from indigenous people at high prices and then landless people have encroached the forestland for agricultural land. - Inadequate law enforcement and supervision of law enforcement; - Inadequate awareness of the community and businesses 	<ul style="list-style-type: none"> - Promoting communication and raising awareness of stakeholders - Strengthening supervision of law enforcement - Controlling the migration status more strictly
2	Excessive and rapid development of greenhouses caused by the demand for high-tech agriculture	<ul style="list-style-type: none"> - Profits from greenhouse-based production - Lack of planning and guidance of functional agencies 	<ul style="list-style-type: none"> - Planning and controlling the greenhouse development by functional agencies
3	<ul style="list-style-type: none"> - Water pollution - Light pollution and thermal pollution caused by high-tech agriculture 	<ul style="list-style-type: none"> - Overuse of pesticides and fertilizers, lack of control over the use of pesticides and fertilizers; little management of agricultural waste. - Waste from everyday life and tourism - Unsustainable development of agriculture without planning 	<ul style="list-style-type: none"> - Developing and supervising the implementation of programs to reduce pollution caused by waste water and waste (from agriculture, everyday life and tourism) - Communicating environmental matters - Enhancing the efficiency of environment companies - Strengthening social and environmental responsibility of enterprises
4	Unplanned and spontaneous development	<ul style="list-style-type: none"> - Inappropriate mechanisms and policies 	<ul style="list-style-type: none"> - Changing and adjusting mechanisms and policies to

No.	Difficulties / challenges	Causes	Solutions
	of tourism leading to the fact that in some areas, tourism has exceeded the environment capacity while in other areas, tourism has not brought its potentials into full play and therefore, wasted resources.	<ul style="list-style-type: none"> - Ineffective surveillance system despite planning 	<ul style="list-style-type: none"> - make them more reasonable - Developing a sustainable and responsible tourism programme - Enhancing the surveillance system
5	Mining minerals (sand, stone, tin) resulting in fragmented landscapes and environmental pollution	<ul style="list-style-type: none"> - Need for economic development - Poor management of environmental exploitation and poor surveillance of assessment of environmental impacts 	<ul style="list-style-type: none"> - Promoting assessment of environmental impacts and surveillance mechanism to minimize negative impacts - Strengthening social and environmental responsibility of enterprises
6	Development of infrastructure (roads) in the buffer zone (causing ecosystem fragmentation) without taking into account the integrity of the ecosystem as well as the conservation of natural values and landscapes.	<ul style="list-style-type: none"> - Need for infrastructure development - Pressure from increased population - Lack of research on master planning based on landscape planning, ecosystem approach and system thinking 	<ul style="list-style-type: none"> - Landscape planning / strategic environmental assessment prepared by Department of Transport (based on assessment procedure developed by MONRE) - Integrating ecosystem approach and system thinking into the planning of infrastructure and socio-economic development.
7	Illegal harvesting of forest products (timber, non-timber, animals) leading to a reduction in the ecosystem's health / value	<ul style="list-style-type: none"> - Dependence of people's livelihood on forest resources - Indigenous people's living habits in close proximity to the forest - Demand for and pressure of forest exploitation from outside (people in other provinces, tourists) - Awareness of stakeholders 	<ul style="list-style-type: none"> - Developing ecosystem conservation programs - Developing sustainable livelihood models to reduce the dependence of local communities on forest resources - Promoting communication to raise awareness and change behavior
8	Natural forest fire	<ul style="list-style-type: none"> - Forest type which is easy to catch fire - Increasing temperature, hotter weather and more droughts (climate change) - Fire accidentally caused by people freely walking and producing goods in the forest - Ineffective fire prevention programs 	<ul style="list-style-type: none"> - Strengthening the effectiveness of fire prevention and fighting programs (monitoring, detection and handling) - Communicating fire prevention and fighting to communities - Upgrading the forest fire alarm system, applying advanced science and technology in fire prevention and fighting

No.	Difficulties / challenges	Causes	Solutions
9	Negative cultural mixture and loss of traditional cultural values of ethnic minorities under the influence of Kinh people	<ul style="list-style-type: none"> - Trends of global integration - Improved socio-economic climate, increased meeting opportunities and the need to keep up with modern trends - People migrating from other regions - Tourism development 	<ul style="list-style-type: none"> - Promoting programs for preserving indigenous culture: writing, language - Promoting the preservation of indigenous culture and folk knowledge
10	Climate change: rising temperatures, increased extreme weather events, unusual natural disasters	<ul style="list-style-type: none"> - Greenhouse gas emissions from production activities and everyday life activities - Forest fire 	<ul style="list-style-type: none"> - Making action plans to cope with climate change at all levels (province, district) - Implementing the Green Growth Plan (Da Lat city) - Enhancing communication on climate change
11	Pressure, threats from cultural and social development (debates, conflicts of interest among stakeholders and among community households)	<ul style="list-style-type: none"> - Increased population, increased demand for consumption, changes in the social structure, losses of land, sovereignty and indigenous rights faced with indigenous peoples (they are now in a weak position), encroachment on forests 	<ul style="list-style-type: none"> - Planning for sustainable development of the biosphere reserve - Coming up with a solution for population stabilization in the biosphere reserve's zones

Appendix 2. Review of legal documents

Developing the Management Plan of LBWBR bases on reviewing all relevant legal documents of economic, social and environmental projects and plans at the national, provincial and local levels. The contents proposed in this management plan should follow the vision and objectives of the socio-economic development plan of Lam Dong Province and ensure the following requirements:

- Complying with land use plans and development plans / programs of other provincial departments;
- Stating clear objectives, responsibilities delegated to stakeholders, activities with specific points of time, and monitoring and evaluation mechanisms; and
- Contributing to achieving the objectives of the Vietnam Agenda 2030 as well as other related policies, plans and strategies.

There are a number of documents, plans, projects and programs prepared by the government and departments, including some contents related to the conservation and development objectives of LBWBR. Important policy documents used as the legal basis for developing the Management Plan, include:

- Prime Minister, 2011. Decision 1462/QĐ-TTg: Approval of the master plan for socio-economic development of Lam Dong Province up to 2020;

- Central Party Committee, 2013. Resolution No. 24-NQ/TW: Actively responding to climate change, strengthening natural resources management and environmental protection;
- People's Committee of Lam Dong Province, 2014. Action Program No. 64-Ctr/TW by Lam Dong Provincial Party Committee: Implementing Resolution No. 24-NQ/TW of the Party Central Committee, Session IX on "Actively responding to climate change, strengthening natural resources management and environmental protection";
- People's Committee of Lam Dong Province, 2016. Decision No. 1164/QĐ-UBND: Establishment of the LBWBR Management Board, Lam Dong Province;
- People's Committee of Lam Dong Province, 2011. Resolution 107/NQ-CP: Land use master plan to 2020 and land use plan for the first period of five years (2011-2015) of Lam Dong Province;
- People's Committee of Lam Dong, 2016. Decision 928/QĐ-UBND. Revised Decision No. 2691/QĐ-UBND: Approval of adjusted planning of three forest types in Lac Duong District, Lam Dong Province, 2013-2020;
- Lam Dong People's Committee, 2017. Decision 169/QĐ-UBND: Approval of the biodiversity conservation plan of Lam Dong Province to 2020, with orientation to 2030;
- People's Committee of Lam Dong, 2016. Decision 322/QĐ-UBND: Approval of the master plan for population distribution in Lam Dong Province to 2020, with orientation to 2025;
- Law on Forest Protection and Development in 2004;
- Law on Environmental Protection in 2005;
- Law on Biodiversity in 2008.

Appendix 3. Some relevant plans and projects

i) Socio-economic development master plan of Lam Dong Province to 2020: The main objectives are to build Lam Dong Province to 2020 to become a relatively developed province in the Central Highlands region, with a high proportion of the service sector in the economic structure, a basically synchronous and modern infrastructure system; to develop the education and training system so as to meet requirements of human resources for development; to improve the material and cultural life of people of different ethnic groups; to maintain defense and security.

Accordingly, Lam Dong Province aims at sustainable development, specifically growing the service sector and the tourism industry, diversifying trade types; developing supporting industries and hi-tech agriculture; establishing brands for a number of agricultural products specific to each region; strengthening sustainable forest management and exploitation, stabilizing the population, further applying new science and technology, protecting natural resources and the environment, actively responding to climate change (Prime Minister, 2011).

ii) Land use master plan to 2020 and land use plan for the first period of five years (2011-2015) of Lam Dong Province (Resolution 107/NQ-CP): According to this master plan, areas of agricultural land, non-agricultural land and unused land will decrease; areas of urban land and tourism land will increase; only the area of the nature reserve land will remain unchanged (Prime Minister, 2013a).

Table 1. Land use status in 2010 and planning to 2020

No.	Type	Status in 2010		Planning to 2020	
		Area (ha)	Percentage (%)	Area (ha)	Percentage (%)
	Total area	977.354		977.354	100,00
1	Agricultural land	900,446	92.13	890,932	91.16
2	Non - agricultural land	53.198	5.44	74.474	7.62
3	Unused land	23.710	2.43	11.948	16.04
4	Urban land	75.364	7.71	90.384	9.25
5	Nature reserve land	91.940	9.41	91.940	9,41
6	Tourism land	9.391	0.96	32.038	3.28

iii) The biodiversity conservation plan of Lam Dong Province to 2020, with orientation to 2030 (Decision 169/QĐ-UBND): Conserving and sustainably developing important natural ecosystems, endangered precious and rare species and gene sources in Lam Dong Province; maintaining and developing ecosystem services in response to climate change; completing basic statistics on the provincial biodiversity database; maintaining and developing LBWBR, national parks, species/habitat conservation areas; building and putting into operation the Central Highlands Nature Museum; Central Highlands Wildlife Sanctuary and Wildlife Rescue Centers (Lam Dong People's Committee, 2017).

iv) General Planning of Da Lat City and neighbouring areas to 2030 and vision to 2050 (Decision No. 704/QĐ-TTg): Developing Da Lat City and neighboring areas following the chain model of urban centers with beltway-based and radial links; connecting ecotourism areas, forest landscape areas, agricultural landscapes; sustainable development; preserving and promoting natural, cultural and historical characteristics; attaching the city development to protection of ecosystems, fauna and flora and biodiversity through the conservation of Bidoup - Nui Ba National Park, protection forests and production forests in Lac Duong, Da Lat, Duc Trong and Don Duong; protecting aquatic and related terrestrial ecosystems throughout the region; developing, notably, in the future, hi-tech agriculture mostly in Lac Duong, Da Lat, Don Duong and Lam Ha; transforming agriculture in the present urban areas into clean and ecological agriculture (Prime Minister, 2014).

v) Management Plan of Bidoup-Nui Ba National Park for the period of 2013 - 2017, vision and orientation to 2020: Effectively protecting the NP's natural resources; raising awareness of forest conservation and indigenous culture protection for local communities; developing and operating a collaborative management model with local communities; utilizing forests through integrated ecosystem services; minimizing pressure from the buffer zone on the core zone due to urbanization and expansion of Da Lat City; and building capacity for the NP's MB to effectively manage natural resources and successfully implement conservation activities (Project PA, 2013).

vi) Agenda 2030 on Sustainable Development: Based on 17 general objectives and 169 specific objectives of Agenda 2030 for Sustainable Development of the United Nations, Vietnam has set the overall (drafted) objectives to the year of 2030 as follows: maintaining sustainable economic growth in

parallel with promoting social advancement and equality, protecting the ecological environment, effectively managing and utilizing natural resources, actively responding to climate change, ensuring that all people are able to call into play their potentials, contribute to the development and equally enjoy development achievements, building a peaceful, prosperous, inclusive, democratic, equitable, civilized and sustainable society.

Out of 17 general objectives, objectives 3, 8, 11, 13 and 15 of Agenda 2030 are in line with general and sectoral strategies and development plans in Lam Dong.

Consequently, the management plan of LBWBR needs to be harmonized, in line with the general objectives of the national and provincial strategies and plans, and those of related sectors as well as the specific objectives (3, 8, 11, 13 and 15) of Agenda 2030 to achieve the objectives of conservation and sustainable development of LBWBR in particular and sustainable development in Lam Dong in general, contribute to sustainable development of the country and the world (Sustainable Development Office, 2016).

Appendix 4: Management Effectiveness Tracking Tool for Bidoup-Nui Ba National Park

The METT was used for Bidoup-Nui Ba Nature Reserve (predecessor of Bidoup-Nui Ba National Park) in 2003, and Bidoup-Nui Ba NP in 2013. The METT should be used by LBWBR's MB for the NP. The METT consists of 3 tables: (i) general information on the nature reserve; (ii) Threats; (iii) Evaluation sheet

Table 1. General information on Bidoup-Nui Ba National Park

Name and contact details of the person responsible for completing the METT				
Date of assessment				
Name of protected area		Bidoup-Nui Ba National Park		
WDPA protected area code (this code can be found on www.wdpa.org/303067)		303067		
Recognition	National	IUCN classification	International (Please fill in the information on the next page)	
	National Park	2 nd	the core zone of the BR	
Country	Vietnam			
Location of protected area (province and map if available)		Lam Dong Province		
Date of founding	11 December 2004			
Ownership details (please tick)	State-owned	Private	Community-owned	Others
	√			
Regulatory Authority		Management Board of Bidoup-Nui Ba National Park		
Area (ha)		70,038.45 ha		
Number of staff		Permanent	Temporary	

Annual budget (US\$) - excluding salaries		Frequent (active)		Project or other supplementary sources	
Main values of the protected area		Natural values; cultural values; and services and ecosystem values			
List two main objectives of the protected area					
First management objective	preserving and effectively utilizing biodiversity values and general ecosystem functions of Bidoup Nui Ba National Park,				
Second management objective	and, at the same time, improving local livelihoods by encouraging community participation in conservation				
Number of people involved in the assessment					
Including (please tick)	PA's Management <input type="checkbox"/>	PA's staff <input type="checkbox"/>	Other agencies <input type="checkbox"/>	NGOs <input type="checkbox"/>	
	Community <input type="checkbox"/>	Donors <input type="checkbox"/>	Specialists <input type="checkbox"/>	Others <input type="checkbox"/>	
Specify the name of the project and the organization or donor for this assessment (if there is any).					

Information about international titles			
UNESCO World Natural Heritage (see whc.unesco.org/en/list)			
Date of recognition	Name of heritage	Area	Geographical coordinates
Not applicable	Not applicable	Not applicable	Not applicable
Criteria for recognition (eg. criterion i to x)			
Validate global highlights			
Ramsar Park (see www.ramsar.org)			
Date of recognition	Name of park	Area	Geographical coordinates
Not applicable	Not applicable	Not applicable	Not applicable
Reason for recognition (according to the RAMSAR data sheet)			
UNESCO Biosphere Reserve (see www.unesco.org/mab/wnbrs.shtml)			

Date of recognition	Name of biosphere reserve	Area	Geographical coordinates
9 th June 2015	Lang Biang World Biosphere Reserve	Total: 275.439 ha Core zone:34.943 ha Buffer zone:72.232 ha Transition zone: 168.264 ha	from 11°41’52” to 12°20’12” North latitude and from 108°09’18” to 108°45’48” East longitude
Criteria for recognition	The recognition of the biosphere reserve is based on 7 criteria: 1) Availability of diverse representatives of ecosystems; 2) High significance of biodiversity conservation; 3) opportunities available for exploring and demonstrating sustainable development approaches at the regional level; 4) sufficient area to ensure the performance of 3 functions; 5) being partitioned in detail; 6) need for organisational arrangements; 7) mechanism of implementation available.		
Implementation of three functions of MAB (conservation, development and support)	Conservation of biodiversity and culture Environmentally-friendly economic development Support for research and education		
List of other honorable titles (eg, ASEAN Heritage, Natura 2000) and supporting information			
Name:	Details:		
Name:	Details:		
Name:	Details:		

Table 2. Threats to the National Park

Please assess all current relevant threats by ticking one of levels of high, medium or low impact. A high-ranking threat seriously undermine values of the protected area; a medium-ranking threat has some negative effects; a low-ranking threat is present but doesn't affect values of the protected area seriously; or N/A means there is no threat or it is not applicable in the protected area.

1. Population and trade development in the protected area

Threats of significant impact from migration and non-agricultural land use

High	Medium	Low	N / A	
				1.1 Housing construction and settlement / migration
				1.2 Commercial and industrial areas
				1.3 Tourism and entertainment infrastructure

2. Agriculture and aquaculture in the protected area

Threats from cultivation and cattle grazing in agriculture and intensive farming, including forestry, and aquaculture.

High	Medium	Low	N / A	
				2.1 Planting annual non-timber trees and perennial trees
				2.1 Planting medicinal plants
				2.2 Planting trees for wood, paper
				2.3 Rearing and grazing cattle
				2.4 Aquaculture

3. Energy production and mining in the protected area

Threats from the production of non-biological resources

High	Medium	Low	N / A	
				3.1 Oil and gas
				3.2 Mining and quarrying
				3.3 Energy production, including hydropower

4. Transport, infrastructure and corridors for wildlife protection

Threats from transport systems and corridors for wildlife protection including the number of wildlife deaths caused by collisions with vehicles

High	Medium	Low	N / A	
				4.1 Roads and railways
				4.2 Road utilities and services (eg. electrical cables, telephone lines, etc.)
				4.3 Shipping of waterways and canals
				4.4 Air travel

5. Exploitation of wild fauna and flora

Threats from deliberate and unintentional consumption of "wild" fauna and flora; including mistreatment or captivity of certain species (hunting and killing animals also included)

High	Medium	Low	N / A	
				5.1 Hunting, killing and collecting terrestrial animals (including killing animals due to conflicts between humans and wildlife)
				5.2 Collecting terrestrial plants or plant products (non-timber)
				5.3 Exploiting wood
				5.4 Fishing, killing and harvesting aquatic resources

6. Intrusion of people and disturbance in the protected area

Threats from human activities which alter, destroy or disturb habitats and species related to unconsumed resources (eg bird and animal watching)

High	Medium	Low	N / A	
				6.1 Recreational and tourist activities
				6.2 War, civil unrest and military exercises
				6.3 Research, education and other related work activities in protected areas
				6.4 Activities done by conservation managers (eg construction or use of transport, artificial sprinklers and dams)
				6.5 Activities to deliberately destroy the protected area or threaten visitors and staff working in the protected area

7. Natural system changes

Threats from other actions that convert or degrade habitats or change the form of ecological functions

High	Medium	Low	N / A	
				7.1 Fire and fire fighting
				7.2 Hydrological changes, dams and water use/management
				7.3a Increased fragmentation in the protected area
				7.3b Separation from other natural habitats (eg deforestation, dam construction without effective pathways for aquatic animals)
				7.3c "side effects" to the values of the protected area
				7.3d Disappearance of important species (eg. top predators, pollinators, etc.)

8. Genetically modified organisms and exotic species

Threats from native and non-native terrestrial and aquatic plants and animals, bacteria or genetic materials or pathogenic bacteria / pathogens whose appearance, growth and spread are expected to harm the biodiversity.

High	Medium	Low	N / A	
				8.1 Invasion of exotic plants (eg. <i>Mimosa pigra</i> , <i>Ageratum conyzoides</i>)
				8.1a Invasion of exotic animals (eg. <i>Dendrolimus punctatus</i> , <i>Pomacea canaliculata</i>)
				8.1b Pathogen (non- native or native but creating new problems or increasing problems)
				8.2 Introduction of genetic materials (eg. genetically modified organisms)

9. Pollution in the protected area

Threats from the appearance of strange materials or excess of materials or energy from identified or unidentified sources

High	Medium	Low	N / A	
				9.1 Household wastewater and urban wastewater

				9.1a Wastewater and waste from facilities in the protected area (eg. toilets, hotels, etc.)
				9.2 Military, mining and industrial waste (eg. water discharged from dams which is of bad quality, temperature, unnatural and oxidized materials and other pollutants)
				9.3 Agricultural and forestry waste (eg. pesticides or excess fertilizers)
				9.4 Garbage and solid waste
				9.5 Air pollutants
				9.6 Excessive energy (eg. heat pollution, lights, etc)

10. Geological events

Geological events may be part of natural changes in many ecosystems, but they can be threats if a species or habitat is damaged and has lost its resilience and susceptibility to disturbance. The management capacity to respond to these changes may be limited.

High	Medium	Low	N / A	
				10.1 Volcano
				10.2 Earthquake / tsunami
				10.3 Snowslide / Landslide
				10.4 Erosion and sedimentation (eg changes of coast or river bed)

11. Climate change, extreme weather

Long-term threats from climate change that could be related to global warming and extreme weather / severe weather beyond the natural range of change

High	Medium	Low	N / A	
				11.1 Habitat transformation and transfer
				11.2 Drought
				11.3 Temperature extremes
				11.4 Storm and flood

12. Cultural and social threats

High	Medium	Low	N / A	
				12.1 Loss of cultural connections, traditional knowledge and/or management practices
				12.2 Natural degradation of important cultural values
				12.3 Destruction of cultural heritage buildings, orchards, areas, etc.

Table 3. Evaluation framework and evaluation results for 2003 and 2013 of the NP

Note:

- Regarding the order of questions: The questions were rearranged to suit the assessment of the NP in the BR. For the sake of future reference, the number of questions (in parentheses) is the same as the original of the WWF Assessment Tool, 2007.

Problem	Criteria	Point	Year			Explanation
			2003	2013	2018	
The total points have been adjusted to % (point / max * 100) (the highest points shown in the 2003, 2013 and present are 91, 99 and 102 points respectively)		100	41	55		

Problem	Criteria	Point	Year			Explanation
			2003	2013	2018	
TOTAL SCORE		102	37	54		
I. MANAGEMENT		78	30	43		
1 (1). Legal status	The establishment of the NP has not been declared.	0	3	3		
Does the NP have legal status? <i>Background</i>	The establishment of the NP has been approved to be declared but this process has not yet started.	1				
	The establishment of the NP is in the process of being declared, but the process is not yet complete.	2				
	The establishment of the NP has been fully declared.	3				
2 (2). Regulations of the NP	There are no regulations for controlling land use and activities in the NP.	0	2	2		
Are there appropriate regulations applied to control land use and activities in the NP? <i>Zoning</i>	There are several regulations for controlling land use and activities in the NP, but these regulations are little effective.	1				
	There are regulations for controlling land use and activities in the NP but their validity is limited.	2				
	There are regulations for controlling inappropriate land use and activities in the NP and these regulations provide a strong foundation for the management of the NP.	3				
3 (3). Law enforcement	The NP staff have no capacity to enforce the regulations and legislation in the NP.	0	1	2		
Are the NP staff capable of enforcing current regulations? <i>Input</i>	The NP staff have little capacity to enforce the regulations and legislation in the NP (eg. their shortage of skills, lack of budgets for patrolling, shortage of institutional support, etc.)	1				
	The NP staff have some capacity to enforce the regulations and legislation in the NP but there are still some key deficiencies	2				
	NP staff have good capacity to enforce the regulations and legislation in the NP	3				
4 (4). The objectives of the	The NP does not have agreed	0	3	2		

Problem	Criteria	Point	Year			Explanation
			2003	2013	2018	
NP Has the management met the agreed objectives? <i>Planning</i>	objectives.					
	The NP has agreed objectives but it is not managed to achieve them.	1				
	The NP has agreed objectives, but is managed to achieve some of them.	2				
	The NP has agreed objectives and is managed to achieve all of them.	3				
5 (5) Design of the NP Is the size of the NP big enough to protect key species and habitats? <i>Planning</i>	The designed size of the NR is not big enough, which means that it will be difficult to achieve key objectives.	0	2	2		
	The designed size of the NR is not big enough, which means that it will be difficult to achieve main objectives but mitigation activities will be undertaken (eg with agreements with adjacent landowners for the corridors of wild animals).	1				
	The designed size of the NR does not impede the achievement of the objectives but should be further improved.	2				
	The designed size of the NR supports the achievement of the objectives well.	3				
6 (6). Boundary marking of the NP Has the boundary been identified and marked? <i>Process</i>	The boundary of the NP has not been identified by the management board, the local authorities or neighboring land users.	0	2	2		
	The boundary of the NP has been identified by the MB but not local authorities or neighboring land users.	1				
	The boundary of the NP has already been identified by the MB, local authorities and neighboring land users but the boundary marking has not been completed yet.	2				
	The boundary of the NP has already been identified by the MB, local authorities and neighboring land users but the boundary marking has been	3				

Problem	Criteria	Point	Year			Explanation
			2003	2013	2018	
	completed.					
7 (7). Management plan	There is no management plan of the NP	0	1	2		
Is there a management plan and has it been implemented? <i>Planning</i>	A management plan is being prepared but has not completed yet.	1				
	There is a management plan, but it has been only partially implemented for funding reasons or other issues.	2				
	There is a management plan and it is being implemented.	3				
<i>Additional points: Planning</i>						
7 (7) a. Planning process	The planning process provides sufficient opportunity for key stakeholders to participate in the management plan.	1	1	1		
7 (7) b. Planning process	The management plan is scheduled to be adjusted and updated periodically.	1	0	1		
7 (7) c. Planning process	Results of monitoring, research and evaluation are often incorporated into planning.	1	NA	0		
8 (8). Regular work plan	There is no regular work plan.	0	2	2		
Is there a regular work plan and has it been implemented? <i>Planning / Output</i>	There is no regular work plan but only a little of work has been completed.	1				
	There is no regular work plan and a lot of work has been completed.	2				
	There is no regular work plan and all of work has been completed.	3				
9 (13). Number of staff of the NP	There are no staff working in the NP.	0	1	2		
Are there enough staff working to manage the NP? <i>Input</i>	There are not enough staff to carry out important management activities.	1				
	The number of staff is lower than the number needed to carry out important management activities.	2				
	There are enough staff to carry out management activities.	3				
10 (14). Staff training	The staff lack necessary skills needed in the management of the NP.	0	1	2		
Are the staff fully trained to be able to implement	The staff are short of necessary	1				

Problem	Criteria	Point	Year			Explanation
			2003	2013	2018	
the management objectives? <i>Input / Process</i>	skills needed in the management of the NP.					
	The staff's skills are sufficient but need to be further improved to adequately fulfill the management objectives of the NP.	2				
	The staff's skills meet the requirements for fulfilling management objectives the NP	3				
11 (15). Current budget	There is no budget for the management of the NP.	0	1	1		
Is the current budget sufficient? <i>Input</i>	The current budget is insufficient for basic management activities and there are severe limitations on management capacity.	1				
	The current budget is acceptably sufficient but needs to be increased for the effective management of the NP.	2				
	The current budget is sufficient for effective management of the NP.	3				
12 (16). Sustainability of the budget	The budget for the management of the NP is entirely dependent on external factors and changes sharply.	0	1	1		
Is the budget sustainable? <i>Input</i>	The budget for the management of the NP is unstable and the NP can not function adequately without external funding sources.	1				
	The budget for the management of the NP is quite sustainable for normal activities in the NP, but improvements are entirely dependent on external funding sources.	2				
	The budget is sustainable for the management of the NP.	3				
13 (17). Budget management	The management of the budget is very poor and ineffective (eg. slow disbursement in the fiscal year).	0	2	2		
Is the budget used to meet management needs? <i>Process</i>	The management of the budget is a bit poor and ineffective.	1				
	The management of the budget is good but needs to be improved	2				

Problem	Criteria	Point	Year			Explanation
			2003	2013	2018	
	The management of the budget is very good and meets the management needs	3				
14 (18). Equipment Is the equipment sufficient for the management needs? <i>Input</i>	There is little or no equipment needed for the management needs.	0	NA	1		
	There is some equipment for the management needs but there is not enough equipment for most of the management needs.	1				
	There is a lot of equipment for the management needs but some equipment is not available, which limits the management.	2				
	There is enough equipment for the management needs.	3				
15 (19). Maintenance of equipment Is the equipment fully maintained? <i>Process</i>	There is little or no maintenance of the equipment.	0	1	2		
	There is some occasional maintenance of the equipment.	1				
	There is basic maintenance of the equipment	2				
	The equipment is well maintained.	3				
16 (21). Water and land use planning Does land and water use planning take into account the NP and support the achievement of the objectives? <i>Planning</i>	Planning of adjacent land and water use does not take into account the needs of the NP and the activities and policies of the planning are damaging to the existence of the NP.	0	NA	1		
	Planning of adjacent land and water use does not take into account the long-term needs of the NP, but activities do not adversely affect the NP.	1				
	Planning of adjacent land and water use takes into account some of the long-term needs of the NP.	2				
	Planning of adjacent land and water use pays full attention to the long-term needs of the NP.	3				
<i>Additional points: Water and land use planning</i>						
16 (21) a: Water and land use planning for environmental conservation	Planning and managing basins or landscapes covering protected areas which are fully subject to environmental conditions (eg.	1	NA	NA		

Problem	Criteria	Point	Year			Explanation
			2003	2013	2018	
	volume, quality and duration of water, air pollution levels, etc.) to maintain the relevant habitat.					
16 (21) b: Water and land use planning for connectivity	Managing corridors connecting the protected area with critical habitats outside the protected area, enabling wildlife to migrate (for example, allowing migratory fish to migrate between freshwater and marine bearing habitats, or allowing animals to migrate)	1	NA	NA		
16 (21) c: Water and land use planning for conservation of ecosystem services and species	Planning meeting the specific needs of the ecosystem and / or the needs of particular species of concern, taking into account the size of the ecosystem (eg. volume, quality and duration of freshwater flow for sustaining specific species and managing fire in dry, flammable environment, etc.)	1	NA	NA		
17 (22). In-line governmental agencies and commercial organisations	There is no contact between managers and in-line staff and no managerial coordination among land users.	0	1	2		
Is there any cooperation with in-line land users? <i>Process</i>	There is little contact between managers and in-line staff and little managerial coordination among land users.	1				
	There is some contact between managers and in-line staff and some managerial coordination among land users.	2				
	There is regular contact between managers and in-line staff and regular managerial coordination among land users.	3				
18 (23). Indigenous Peoples	Indigenous peoples and permanent residents in the NP are not involved in the decision-making process for the management of the NP.	0	1	1		
Are indigenous peoples and permanent residents in the NP involved in the decision-making process for the management of the NP?	Indigenous peoples and permanent residents in the NP are a little involved in the decision-making process for the	1				

Problem	Criteria	Point	Year			Explanation
			2003	2013	2018	
<i>Process</i>	management of the NP.					
	Indigenous peoples and permanent residents in the NP are partly involved in the decision-making process for the management of the NP but their involvement should be improved.	2				
	Indigenous peoples and permanent residents in the NP are directly involved in the decision-making process for the management of the NP.	3				
19 (24). Local communities	Local communities are not involved in the decision-making process for the management of the NP.	0	1	1		
Are local communities living in and near the NP involved in the decision-making process for the management of the NP? <i>Process</i>	Local communities are a little involved in the decision-making process for the management of the NP.	1				
	Local communities are partly involved in the decision-making process for the management of the NP but their involvement should be improved.	2				
	Local communities are directly involved in the decision-making process for the management of the NP.	3				
<i>Plus points: Local communities / Indigenous people</i>						
19 (24) a. Impact on the communities	There is open and reliable communication between indigenous peoples and local communities, stakeholders and the NP's managers.	1	1	0		
19 (24) b. Impact on the communities	There are programs which are aimed to improve livelihoods for the communities but still maintain the resources of the NP.	1	0	1		
19 (24) c. Impact on the communities	Indigenous and local people actively support the NP.	1	0	0		
20 (26). Monitoring and evaluation	There is no monitoring and evaluation system for the management of the NP.	0	0	2		
Is the implementation of management activities	There are occasional monitoring and evaluation activities for the	1				

Problem	Criteria	Point	Year			Explanation
			2003	2013	2018	
monitored? <i>Planning / Process</i>	management of the NP, but there is no overall strategy and / or the activity of collecting results regularly.					
	There is a monitoring and evaluation system for the management of the NP, but the results have not been reported for improvement of management activities.	2				
	There is a monitoring and evaluation system for the management of the NP and the results have been reported for the improvement of management activities.	3				
21 (29). Fees If there are fees applied (eg. entrance fees, fines), do they support the management of the NP? <i>Input / Process</i>	Although the fees are theoretically applicable, they are not collected.	0	NA	2		
	Fees are collected but they do not contribute to the management of the NP.	1				
	Fees are collected but they contribute slightly to the management of the NP.	2				
	Fees are collected but they contribute significantly to the management of the NP.	3				
22 (30). Conditions of the values What are the conditions of the key values of the NP? <i>Output</i>	Many cultural, ecological and biodiversity values of the NP are seriously degraded.	0	2	1		
	Some cultural, ecological and biodiversity values of the NP are seriously degraded.	1				
	Some cultural, ecological and biodiversity values of the NP are partially degraded but important values have not been significantly affected.	2				
	Cultural, ecological and biodiversity values of the NP have not been affected.	3				
<i>Points added: Conditions of values</i>						
22 (30) a: Conditions of values	Evaluating the conditions of values is based on research and / or monitoring	1	NA	1		

Problem	Criteria	Point	Year			Explanation
			2003	2013	2018	
22 (30) a: Conditions of values	Specific management programs are being implemented to address threats to cultural, ecological and biodiversity values of the NP.	1	NA	0		
22 (30) a: Conditions of values	Activities to maintain important ecological, ecological, and biodiversity values are carried out regularly in the management of the NP.	1	NA	1		
II. CONSERVATION		9	3	3		
23 (9). Inventory of resources	There is little or no information on the critical habitats, species and cultural values of the NP.	0	1	1		
Does the NP have enough information to manage inventory of resources? <i>Input</i>	Information on important habitats, species and cultural values of the NR is insufficient for planning and decision-making.	1				
	Information on key habitats, species and cultural values of the NR is sufficient for planning and decision-making for key areas.	2				
	Information on the critical habitats, species and cultural values of the NR is sufficient for planning and decision-making for all areas.	3				
24 (10). Security systems	Security systems (eg. patrolling, licensing, etc.) are not available or are ineffective in controlling access to or use of resources.	0	1	1		
Can the existing security systems control access to or use of resources of the NP? <i>Process / output</i>	The security systems available have low effectiveness in controlling access to or use of resources.	1				
	The security systems available have medium effectiveness in controlling access to or use of resources.	2				
	The security systems available are highly effective in controlling access to or use of resources.	3				
25 (12). Management of resources	The active management of resources has not been implemented.	0	1	1		

Problem	Criteria	Point	Year			Explanation
			2003	2013	2018	
Is the active management of resources implemented? <i>Process</i>	There are very few requirements for the active management of critical habitats, species and cultural values to be implemented.	1				
	There are a number of requirements for the active management of critical habitats, species and cultural values to be implemented, but some key issues remain unresolved.	2				
	The requirements for the active management of critical habitats, species and cultural values are fully implemented.	3				
III. DEVELOPMENT		9	1	5		
26 (25). Economic benefits	The NP does not provide any economic benefits to local communities.	0	1	2		
Does the NP provide economic benefits to local communities, for example, income, jobs, payments for environmental services? <i>Output</i>	The potential economic benefits which the NP can provide are realised and planned to to be used for local communities.	1				
	The NP provides some economic benefits to local communities.	2				
	The NP provides important economic benefits to local communities.	3				
27 (27). Facilities for guests	There is demand but there are no facilities and services for visitors.	0	0	2		
Are facilities adequate for visitors? <i>Input</i>	Facilities and services for visitors do not meet the current number of visits.	1				
	Facilities and services for visitors meet the current number of visits but need further improvement.	2				
	Facilities and services for visitors meet the current number of visits well.	3				
28 (28). Commercial tour operators	There is little or no contact between managers and commercial tour operators doing business in the NP.	0	0	1		
Are commercial tour operators contributing to the management of the NP?	There is contact between managers and commercial tour operators doing business in the	1				

Problem	Criteria	Point	Year			Explanation
			2003	2013	2018	
<i>Process</i>	NP but most of it is about administrative issues.					
	There is a little contact between managers and commercial tour operators doing business in the NP about enhancing the tourism experience and maintaining the values of the NP.	2				
	There is good coordination between managers and commercial tour operators doing business in the NP in enhancing the tourism experience and maintaining the values of the NP.	3				
IV. SUPPORT		6	1	3		
29 (11). Research Is there a survey program for management and research? <i>Process</i>	There is no survey or research conducted in the NR.	0	0	1		
	There are few research surveys but not directly aimed at the management needs of the NR.	1				
	There are a remarkable number of research surveys but not directly aimed at the management needs of the NR.	2				
	There is a comprehensive and integrated research program in line with the management needs of the NP.	3				
30 (20). Education and awareness-raising Is there an education program planned to be in line with objectives and needs? <i>Process</i>	There is no education and awareness-raising program.	0	1	2		
	There are very few and infrequent education and awareness-raising programs.	1				
	There is an education and awareness-raising program that meets only some of the needs and needs to be improved.	2				
	There is an adequate and appropriate education and awareness-raising program	3				

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