

AMERICAN UNIVERSITY OF BEIRUT

A COMPARATIVE STUDY OF A PROTECTED AREA AND
A BIOSPHERE RESERVE IN LEBANON

by
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ABSTRACT

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Human survival and evolution are directly and indirectly dependent on biodiversity conservation and the different ecosystem services that assure the wellbeing of people. Protected areas and biosphere reserves are two land conservation approaches that were developed independently by the International Union for Conservation of Nature (IUCN) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO) respectively. Both land conservation approaches are adopted by countries all over the world and aim at protecting biodiversity, providing clean air and water as well as protecting the environment from natural disasters caused by climate change. Lebanon, like many countries, has established protected areas and biosphere reserves to conserve its biodiversity. This study looks at two case studies, a protected area – Horsh Ehden – and a biosphere reserve - Jabal Moussa - to develop an understanding of how these were established, their history, governance structure and their current state. In depth interviews were conducted following a stakeholder analysis and desk research. The research findings revealed similarities and differences between the case study protected area and biosphere reserve at the level of governance structure, land ownership, and government oversight. In addition, the study explains similarities and differences in criteria to be considered when establishing a biosphere reserve or a protected area. The findings of this study may inform, and guide policy makers, civil society, and local communities interested in land conservation.

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ABBREVIATIONS

BR	(Biosphere Reserve)
PA	(Protected Area)
MOE	(Ministry of Environment)
MAB	(Man and Biosphere Program)
APJM	(Association for the Protection of Jabal Moussa)
IBA	(Important Bird Areas)
ICC	(International Coordinating Council)
ACBR	(Advisory Committee for biosphere reserve)
SPAW	(The Protocol for Specially Protected Areas and Wildlife)

CHAPTER I

INTRODUCTION

Our environment today faces one of the most significant threats there is to it, which is the depletion of land and resources. Due to population growth and the increase in demand for resources, ecosystems are bearing the consequences of people's actions all around the world. Due to overexploitation of land and resources, many have come to realize that if the situation continues as it is, the planet will ultimately run out of the land and natural habitats. Nature is man's most crucial resource of survival. Ever since the industrial revolution, the environment we live in has started to become more and more endangered. As people moved from rural areas and developed cities, the availability of natural areas started to decrease (CBD, 2008). Thus, the only way to be able to save and take care of the environment and natural resources are conservation measures that target the protection of nature.

Human survival and evolution are directly and indirectly dependent on biodiversity conservation. Nature is a source of fiber, food, and provides different ecosystem services that assure the wellbeing of people. They protect services such as water, provide clean air, and are a protection mechanism against natural disasters. Exploring protected areas takes people back to also appreciating the cultural value of nature. Exploring these new areas helps individuals be one with their environment and understand it; it is also a source of education and exercise. They offer a sense of adventure, challenge, and self-discovery (Djoghlaif, 2008).

Protected areas and biosphere reserves are two independent ideas and concepts of land conservation which are adapted by different countries all over the world. Both

methods aim at protecting biodiversity, providing clean air and water as well as protecting the environment from natural disasters caused by climate change.

A. Background Information

Conservation is defined as the comprehensive approach to preserving and taking care of what is already there for the future generation, it also includes restoration of what has been destroyed to convert it back to its natural state to be able to make use of it in the future. For conservation to be successful, ethical, social, and scientific tools must be used in addition to environmental laws and regulations (Mason, 2019)

Conservation efforts dated back to the industrial era, in response to the exploitation of uncontrolled industrial growth and capitalism. During that time, the world ran almost entirely on coal, this was when people started to realize that coal is not an infinite source, started questioning the availability of other resources, and what they would do if they ran out of natural resources (Mason, 2019)

To guide the conservation strategy, two major movements were launched in the 60s and 70s. The concept of protected areas by IUCN and the concept of Biosphere reserves by UNESCO.

In the 1960s, the IUCN established the concept of protected areas, these areas are vital for biodiversity conservation, they provide clean air and water, and they contribute to the protection against natural disasters in response to climate change. Protected areas also contribute to the livelihoods of local communities, they serve as a source of income to millions of people through tourism (IUCN, 2019)

Over the past two decades, the number of protected areas has dramatically increased globally. These areas today represent the solution to climate change as well as the

safeguard of nature, cultural resources, and mitigated human impacts on biodiversity. Currently, there exist around 202,467 protected areas around the world that make up around 20 million square kilometers or around 14% of the world (IUCN, 2019)

UNESCO is another international organization that launched the concept of biosphere reserves in the 1970s. These areas which are internationally recognized, labeled, and nominated by governments serve as a “Laboratory” for monitoring the management of land, water, and biodiversity (What is Biosphere Reserve, 2019). In 1968, UNESCO organized a biosphere conference where it recognized the concept of a biosphere reserve, the conference aimed to examine how to resolve conservation of natural resources. The conference resulted in recognizing the “Man and Biosphere” (MAB) program in 1970. This conference agreed on several criteria which make an area to be characterized as a biosphere reserve, these areas are 1) typical of the world's terrestrial or coastal ecosystems, 2) demonstrate advanced approaches to living in harmony with nature, and finally 3) show how to attain a sustainable balance between conserving ecosystems and biodiversity. Currently, there are 701 biosphere reserves actively existing around the world under the supervision of UNESCO in the MAB (Man and biosphere program) in 124 countries, including 21 transboundary sites which are distributed as follows: 79 sites in 29 countries in Africa, 33 sites in 12 countries in the Arab world, 157 sites in 24 countries in Asia and the Pacific combined, 302 sites in 38 countries in Europe and North America combines and 130 sites in 21 countries in Latin America and the Caribbean combined (UNESCO, 2020)

Biosphere reserves are divided into 3 main zones, the first zone is the core (also known as natural) zone, which is the innermost zone, this part is legally protected and untouched. Surrounding the core is the buffer zone, which is managed to accommodate

a great diversity of resources mainly used for research and educational purposes. The third and final zone, which is the outermost part of the reserve, is the transition zone which has an active interaction between the reserve, its management, and the locals including the tourists, where different activities such as cropping, forestry, recreation, and others take place. From protecting these areas, several benefits can be gained which are directed to the people and the environment. The benefits include: restoration of degraded ecosystems, preservation of genetic resources and species, supporting educational activities and research, and maintaining social, cultural, and economic developments (Jaisankar, Velmurugan, & Sivaperuman, 2018)

B. Justification

Establishing conservation areas is an essential step for countries to meet their global commitments which is the post 2020 global biodiversity framework to ensure the “development and implementation for the 2050 vision for living in harmony with nature” (IUCN, 2020) and reach global conservation targets called the Aichi Conservation targets made up of 20 targets divided into five different categories (*Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society, Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use, Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity, Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services, Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building*) (CBD, 2020) to nature conservation. Furthermore, the process of conservation of the natural heritage addresses poverty alleviation, water

security, pollution control, climate change adaptation, economic development, and disaster-risk reduction. The establishment and management of conservation sites is proposed by different organizations such as IUCN and UNESCO, however it is not clear how they differ and whether these approaches may lead to different conservation outcomes. Understanding similarities and differences between proposed approaches by these two leading organizations is essential to guide countries and local authorities when they want to decide on the type of protection, and what model to follow.

C. Objective

This study seeks to understand the difference in governance between biosphere reserves and protected areas. Using a protected area, Horsh Ehden, and a biosphere reserve Jabal Moussa, in Lebanon as case studies, it will investigate their history, establishment, governance, and their current state.

D. Literature Review

Several studies have been conducted on different biosphere reserves and protected areas around the world, however, not many studies talk about the differences and similarities between the two. These studies define and explain the goals of biosphere reserves and protected areas in several ways even though the main goal of both is conservation of land and biodiversity.

The idea of protected areas and conservation has been around for many years and used in different forms (Watson et al., 2014). Even though the concept of these areas has evolved and expanded with time, many of the latter do not function as needed and as originally planned, and still face many problems while trying to conserve these

areas (Geldmann et al. 2015). Today, different debates affect the deliverables of these protected areas, debates concerning habitat loss and species conservation, as well as the limited information available regarding the outcomes of the reserve and its management (Laurance, 2013).

Studies have been piloted in Australia, Costa Rica, Germany, and many more to highlight the importance of conservation areas as well as the main aim behind them, these studies show how the conservation and management system has changed with time without changing the main objective of the area.

Protected areas are widely accepted around the world as a place for the conservation of biodiversity. Many years ago, when protected areas were first established, ecologists and forestry officials were the main managers of the reserve with some minimal interference from land-use planners. Today, people from different environmental and non-environmental backgrounds contribute equally in the management and conservation of these designated areas. Conservation of land is part of the millennium development goals with a mission much bigger than what it used to be many years ago and are believed to have an impact on national development and poverty reduction in the future (Naughton-Treves et al., 2005).

Protected areas are widely accepted around the world as a place for the conservation of biodiversity. Many years ago, when protected areas were first established, ecologists and forestry officials were the main managers of the reserve with some minimal interference from land-use planners. Today, people from different poverty reduction in the future (Naughton-Treves et al., 2005).

One study conducted on the Monteverde protected area in Costa-Rica shows how throughout the years the management approach of the protected area has evolved

and changed with time, without changing its main objective, which is the protection of the ecosystem and natural habitat (Davis, 2007). This study shows that the protected area was first created for the protection and conservation of land, agriculture and water reserve within the boundary of the Costa Rica protected area. People today have established different ways of making use of the reserve and gaining economic benefits without harming and destroying it (Davis, 2007).

With the different environmental changes going on in our world today (changes such as population growth, need for agriculture, land, and others.) protected areas are the one hope for conservation of natural habitat and species. Thus, management and protection is a priority for sustainability and life (Mukul et al., 2017)

The second type of land conservation established later on was the idea of biosphere reserves. The concept of Biosphere reserves was first established as a way for implementing project number 8 of the man and biosphere program of UNESCO which is the 'conservation of natural areas and of the genetic materials they contain' (Ishwaran, Persic, and Tri, 2008). These reserves were established to be able to protect and conserve land as a general area rather than focusing on one specific aspect. As the aims and purposes of the biosphere reserves were being set, they were informed to view its principles from different perspectives and goals including conservation, ecological and environmental science research, education, and training (Ishwaran, Persic, and Tri, 2008). Biosphere reserves are selected locations to study and understand how to sustainably conserve and protect social and ecological systems, these locations have four main goals: (1) conservation of biodiversity, viable use of natural resources and reclamation of damaged ecosystem services, (2) sustainable human development and growth, (3) spreading of environmental education and knowledge and finally, (4)

adaptation to climate change to restore damages and enhance the environment (Ferreira et. al, 2020). Biosphere reserves were first established with a goal very similar to that of protected areas, however, one element in its establishment differs from that of protected areas.

Biosphere reserves aim to include not only the area to be protected but also the community living around the reserve (Behera, 2012).

A study conducted on the Rhön Biosphere Reserve Germany, designated by UNESCO in 1991 is considered to be a rural area, where people live. The main aim of the reserve is the conservation of abiotic resources and biodiversity. Another aim for biodiversity is education, where their goal is to teach locals and visitors about sustainable development and what is needed to achieve it (Pokorni, 2006). Their success depends highly on the locals and their commitment as well as creativity, and most importantly their courage to take risks in trying out new ways to achieve sustainability. To establish the biosphere reserve, the management team had to work on several different aspects: (1) convincing locals about the importance of the reserve in the region, (2) relationship among the different stakeholders, (3) Providing the different ways sustainability will be achieved in the reserve (Pokorny, 2006). After working on the project for three years, the management team was able to come up with a management framework to establish the reserve, it included goals and objectives the reserve would meet as well as how they would meet them. Their management team also established the zoning system based on the UNESCO zoning for biosphere reserve (Pokorny, 2006).

E. Governance Structure:

Key to a successful biosphere reserve or protected area is its governance structure and management plan. Governance structures provide a good guide towards the right way of conservation and help in proper decision-making and metrics for a good and effective conservation in the case of conservation areas. Governance structures help create a bond between the higher management team and the on-ground management team to establish a way of communication and implementation of decisions taken for the conserved areas.

Since protected areas and biosphere reserves are based on two different organizations being the IUCN and UNESCO, each has its own governance structure based on guidelines and plans set by the authorities.

IUCN has set four different governance types for protected areas, these four types are an explanation of who has an influence and accountability for decisions related to protected areas. The four types are: governmental governance, shared governance, private governance and governance by indigenous people and local communities (Borrini-Feyerabend et al., 2015)

Management of protected areas within the reserve or from a higher state has evolved immensely with time, it is how different stakeholders and members interact together to govern the specific reserve by using authority, contacts, rights, responsibility and accountability (Abrams et al., 2003) for good management of protected areas, the IUCN has established what is known as the IUCN matrix, which interrelated the different IUCN categories of protected areas with the different governance types, to be able to report and monitor the protected area designated on a local and international level (Borrini-Feyerabend, 2007)

The IUCN matrix has 4 different types of governance for protected areas which within each type there are 2 to 3 different subcategories for a detailed management matrix. The 4 types of structures set are: government managed protected areas, Co-managed protected areas, private protected areas and community conserved areas (Borrini-Feyerabend, 2007) any type of protected area could fall under any of the four categories of the matrix or could use a mix of the classes for its management. When it comes to the management and governance of protected areas, sponsors and decision-makers usually for familiar with categories of protected areas rather than governance types, however knowing the governance types helps have a clearer idea regarding authority and responsibility which will help have a clearer and more accurate idea regarding the reserve and decision making (Borrini-Feyerabend, 2007)

On an international scale, the IUCN matrix can be implemented in the “World database on protected areas” as well as the international UN list of protected areas for any research, reporting and monitoring concerning protected areas. On the national level, it can be used to understand the system of the protected area within the country and its plan in parallel to the circumstances of the country its located in (Abrams et al., 2003)

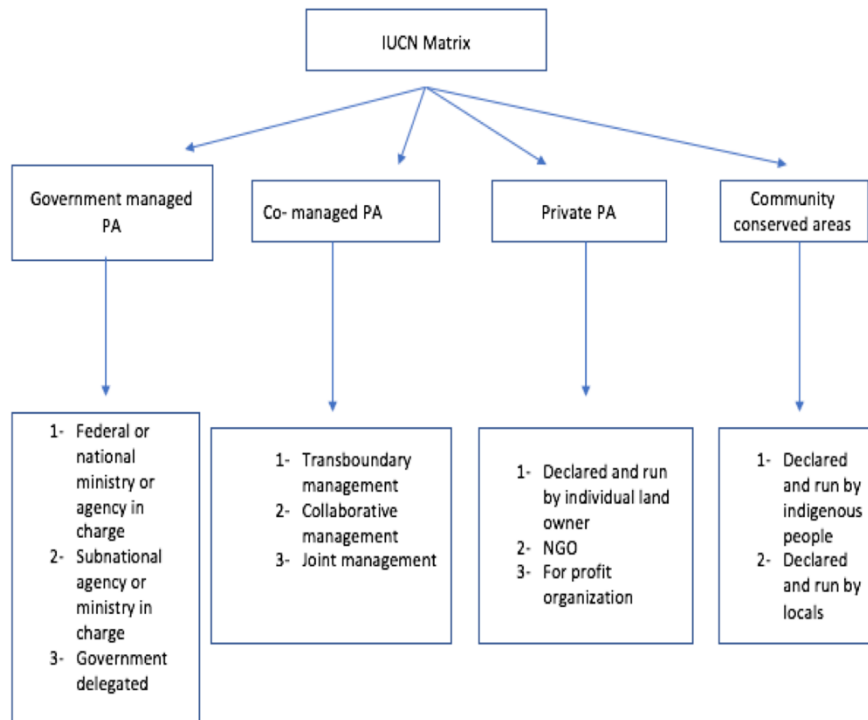


Figure 1: IUCN matrix for Protected Area governance (Borrini-Feyerabend, 2007)

Biosphere reserves on the other hand, have a different strategy for their governance structure which is set and established by UNESCO and the MAB. Biosphere reserve management does not only depend on the on-site active members of the reserve, but also depends on how the stakeholders and the team which communicate and interact with international stakeholders around their legislations and international frameworks (Berkes, 2007) this is why, the MAB has established different sectors who work together to be able to establish, manage and monitor biosphere reserve on a long-term scale. The first team established by the MAB is the International Coordinating Council (ICC) which works in parallel with the International Advisory Committee of biosphere reserves (ACBR). The ICC is responsible for directing and implementing the program set by the general counsel and by comments pointed out by the ACBR. The main job of the advisory committee is to examine proposals for biosphere reserves as

well as advising and proposing changes and modifications which can help improve the biosphere reserve and conservation in the reserve (Schliep & Stoll-Kleeman, 2009)

The ICC and ACBR together share the plan and proposal set for the biosphere reserve with the MAB secretariat which in turn submit the information to the World network of Biosphere reserves, the international committee later on share the information with the supra-national networks (10 in total being ArabMAB, EuroMAB etc.) who exchange information with the MAB national Committee of the country the reserve is established in, to finalize and submit to the individual biosphere reserve itself. (Schliep & Stoll-Kleeman, 2009)

This entire process does not only work for when the reserve is being established, but also to keep up with changes that occur within the reserve and for the projects they carry on regarding conservation and management.

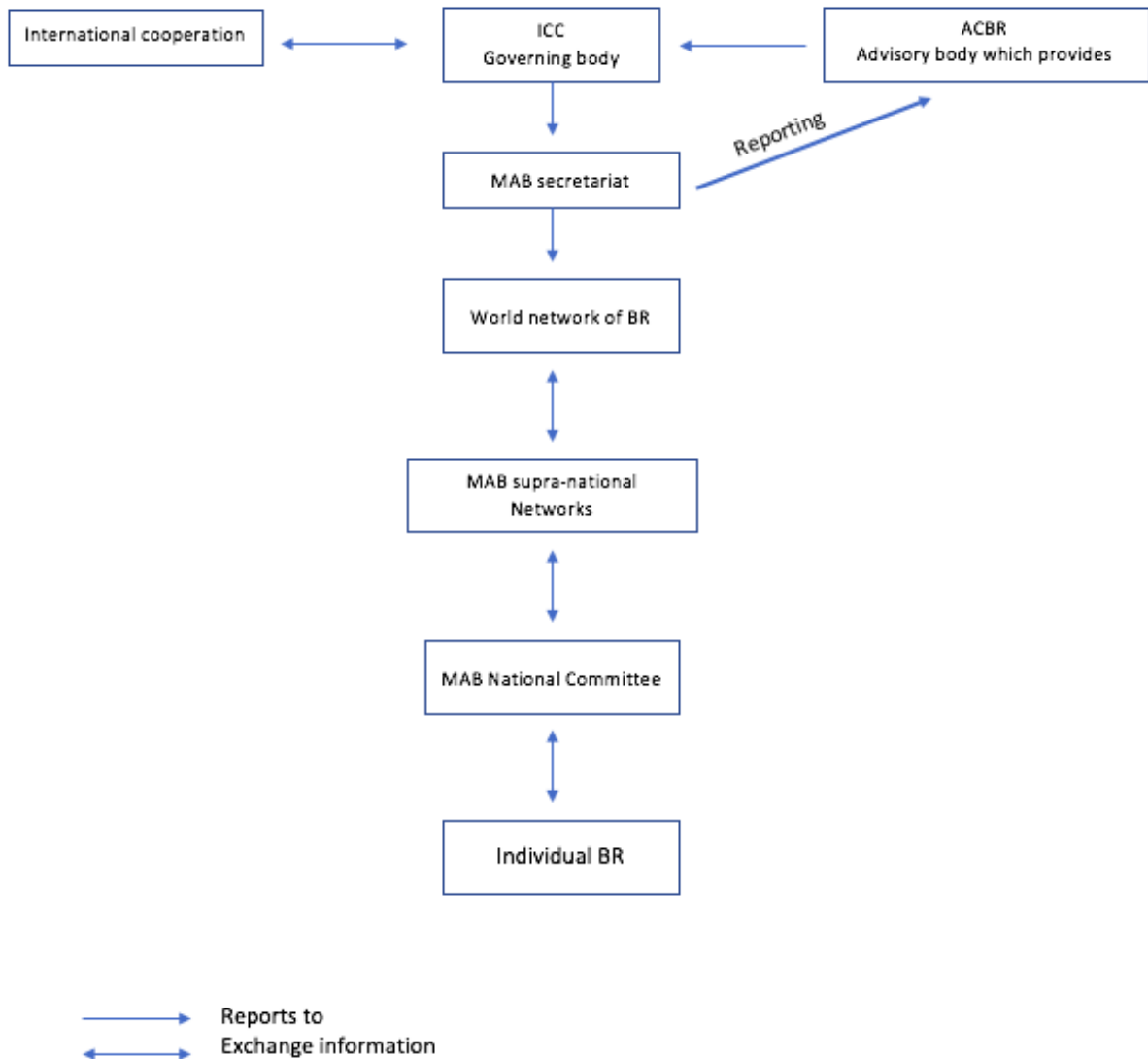


Figure 2: Governance structure of Biosphere Reserves (Schliep & Stoll-Kleeman, 2009)

By comparing the different studies mentioned above and looking at how similar yet different protected areas are from biosphere reserves, this study is being conducted to identify the differences between the two in two different conservation areas located in Lebanon which are the Jabal Moussa Biosphere reserve and Horsh Ehden protected area.

CHAPTER II

MATERIALS AND METHODS

A. Study Site

The study is based upon two different conservation lands in Lebanon, the Horsh Ehden protected area and Jabal Moussa biosphere reserve. Horsh Ehden is situated on the upper northwestern slopes of Mount Lebanon, ranging in altitude from 1200 m to 2000, Horsh Ehden Nature Reserve covers more than 450 ha and is considered to be a very important part of the country for its unique biodiversity. It is labeled as an “Important Bird Area”, and the amount of plant species recognized till now is nearly 40% of the plant species of Lebanon. It is known for its Cedar forest, which makes up 20% of the cedar forest in Lebanon.

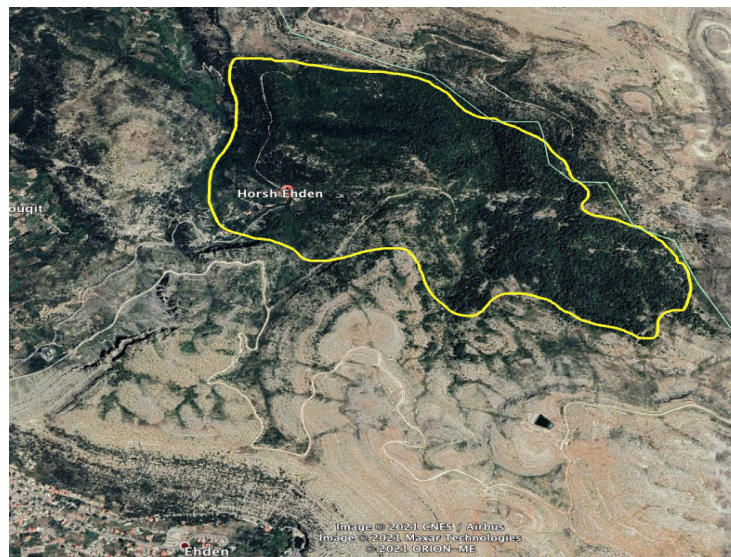


Figure 3: Location of Ehden on the map of Lebanon (Google Maps)

Jabal Moussa is a biosphere reserve located in the Kesrouan district, on the shoulders of the western slopes of Mount Lebanon. It has a rich natural and cultural

heritage, with many plant species that are endemic to Lebanon or even Jabal Moussa, as well as being the habitat for nationally endangered animals like the tabsoun or rock hyrax. The reserve also contains many sites of archaeological interest spanning the Bronze Age to Ottoman periods, some of which have been already conserved or restored by its association. It has an altitude of 350 to 1700m and an area of 6500 ha. The reserve is surrounded by 7 villages Yahchouch, Ghbaleh, Jouret el Termos, Nahr el Dahab, Qehmez, Chouwan, and Al Iibrè

The reserve was stabled in 2007 by the APJM (Association for the protection of Jabal Moussa) The site is known or thought to be a ‘bottleneck’ site where at least 20,000 storks (Ciconiidae) or raptors (Accipitriformes and Falconiformes) or cranes (Gruidae) regularly pass during spring or autumn migration. Its habitat is made up of the following: 40 % Woodland, 40% scrubland, 10% agriculture, less than 1% artificial (quarry and buildings) It also has a large variety of wildlife (14 large and medium mammal species such as the Rock Hyrax. 215 plant species among which 20 tree species and 11 endemics

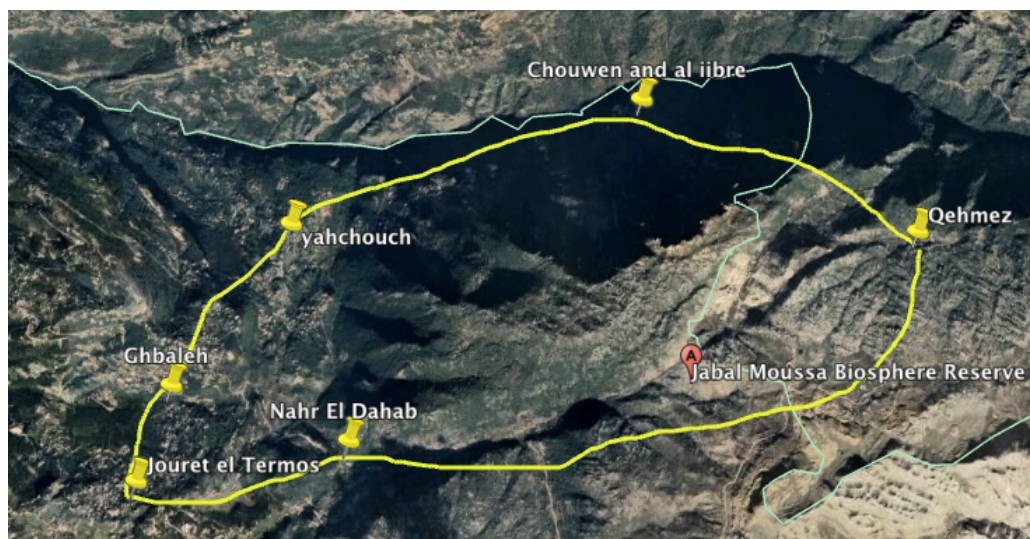


Figure 4: Map of Jabal Moussa Biosphere reserve on the map of Lebanon (Google Maps)

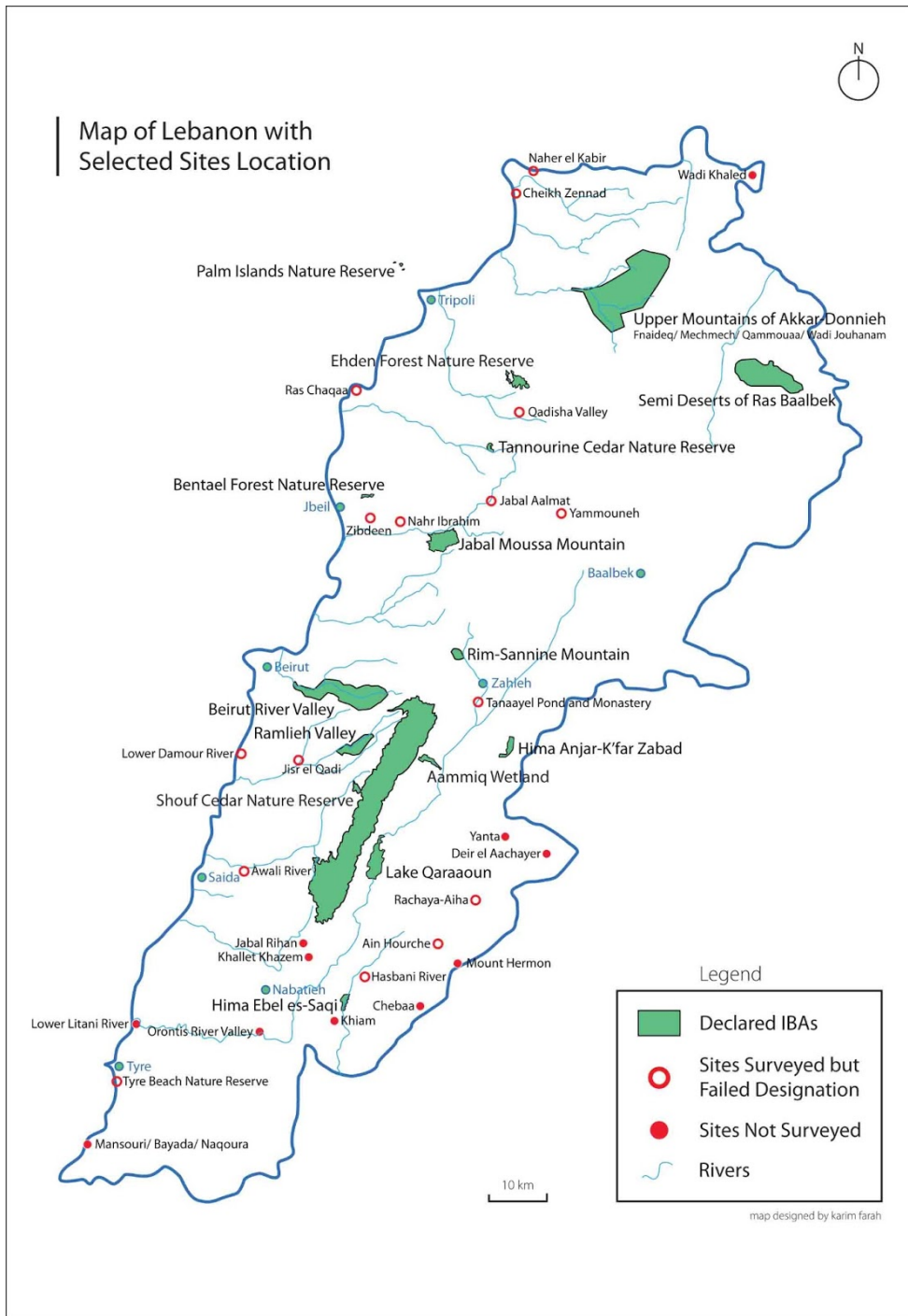


Figure 5: Map of Protected areas and Biosphere reserves in Lebanon (Ecocentra, 2016)

B. Data collection, verification and processing

The two areas where the research was conducted are Jabal Moussa biosphere reserve, and the Ehden protected area. Stakeholder analysis was piloted to be able to identify those who will be contacted to hold interviews with. Stakeholder analysis is a technique used in management studies, it is commonly used for generating knowledge about actors whether individuals or organizations, their behaviors, interests, and their stand-in decision making (Rastogi et al, 2010). Stakeholder analysis also helps identify the current stand of actors in projects as well as plans for the project and the people contributing to the project. “Reputational Approach” was used for this study (Rastogi et al, 2010); this approach involves consulting knowledgeable individuals for their suggestions to enumerate the stakeholders (Rastogi et al, 2010). Once the stakeholders were identified, an in-depth interview was conducted to be able to get detailed information about their knowledge of the studied area. The in-depth interview is qualitative research that uses a small number of respondents with a large amount of information gained. When the number of interviewees is smaller, more time will be provided to them to answer more comfortably and freely where details will matter and help in making the study more accurate (Boyce, 2006). In-depth interviews have several advantages as well as disadvantages, some of its advantages include: provision of more detailed information as well as relaxation and comfort to the person interviewing and being interviewed, these two are very important when it comes to data collection to be able to collect factual and accurate information (Rastogi et al., 2010)

The following characteristics were used to identify the primary stakeholders which helped name others to be included in the interviews (Rastogi et al., 2010)

- 1- Knowledge levels about the biosphere reserves and protected areas that the study will take place in
- 2- Knowledge about the people who live and work in the region
- 3-Their interest in the biosphere reserves or protected area and the advantage and disadvantages observed by these stakeholders
- 4- Their relationships with other stakeholders
- 5-Leadership: which is the amount of input they bring to the biosphere reserve and protected area

Once the interviews were conducted, the first step taken was the transcription of data followed by a thematic analysis from the information gathered which was later on revised and discussed (Erlingsson and Brysiewicz, 2017)

The interviews conducted gave us an idea of why and how the protected area and biosphere reserve were first established, their goals and how they evolved with time (Malkawi, 2017). Additional information such as the activities and the changes that have happened during the years in the reserve were collected, these data will help give an idea on how changes during the years have attracted more people to visit the reserve and how people's perception of the reserve has changed (Rastogi et al., 2010)

The questionnaire prepared was translated into Arabic as well to be able to use the preferred language of the interviewee for them to answer more comfortably during the one on one interviews. All interviews were audio-taped as consent was taken from those being interviewed and later on translated into English and transcribed to conduct a thematic analysis by identifying different themes and codes for the information collected.

C. Ethical Consideration

Interviews were conducted in both Horosh Ehden and Jabal Moussa in compliance with the guidelines on human subjects for Social and Behavioral Sciences adopted by the Institutional Review Board (IRB) at the American University of Beirut (AUB). All the interviews were recorded on a password protected device and were only used by the researcher. All the interviews conducted were anonymous, since there was no personal or private information gathered by the interviewer and the study conducted was completely voluntary. Since most of the interviews conducted were by the phone, oral consent was taken from the interviewees to record the interview.

CHAPTER III

RESULTS

A. Historical overview

Before Horsh Ehden was turned into a protected area by the MoE, it was a public land unsustainably used by local communities for grazing, wood cutting, and picnics. During this period, the church, representing most of the local communities in the area, took upon itself the responsibility of protecting lands from excessive exploitations including uncontrolled grazing and tree cutting.

An interviewee said

“The members of the Church used to do all that they could to protect the land, the priest even punished those who cut trees and tried to harm the nature because it was the only way to stop locals from invading the land”

The case of Jabal Moussa is like that of Horsh Ehden in terms of unsustainable practices; nearby residents practiced uncontrolled grazing, quarrying and cleared natural areas for agriculture. One of the participants explained that during the Ottoman empire most residents worked in the silk industry and planted the lands with mulberry and wheat. However, as the silk industry and agriculture both declined, people abandoned the lands and moved to cities in contrast, grazing persisted and quarrying activities were started.

B. Establishment of the conservation area:

Protected areas in Lebanon did not exist prior to 1992. Horsh Ehden was one of the first three protected areas declared by the government of Lebanon, although the

process was not formalized up until 1996. The establishment of the Horsh Ehden PA was financed through GEF (Global Environmental Facility), backstopped by the IUCN, and locally implemented by the UNDP through a local NGO that was established specifically for the management of the protected area.

According to one interviewee, the interest in formally protecting Horsh Ehden was led by environmental activists who attended a lecture about Horsh Ehden, its history and its importance in terms of biodiversity at the American University of Beirut. The lecture on Horsh Ehden triggered the interest of the activists who mobilized residents from Ehden and worked with them to formally protect the area. However, since Lebanon did not have a ministry of environment at the time (it was formed in 1993), these activists took it upon themselves to protect the land until the official establishment of the reserve in 1996. Horsh Ehden protected area was established based on the IUCN global guidelines, as well as national guidelines set by the MOE. The newly established NGO, which consisted of residents, was put in charge of the management of the newly protected area. The list of members of the management team was presented to the MoE, municipality and parliament for official approval. When the GEF funding ceased, the MoE took charge supervising and funding management activities in the Horsh Ehden PA.

The protection of Jabal Moussa followed a similar ad hoc path to that of Horsh Ehden. According to an interviewee the interest in protecting Jabal Moussa started during the 2006 war on Lebanon when people from Qamhez heard strange noises coming from nearby, only to find out they were due to illegal quarrying. In response a group of residents and environmental activists decided to formalize the protection of the land following the biosphere reserve concept. An NGO, Association for the protected of

Jabal Moussa, was formed for this purpose and it presented a proposal for the creation of the Jabal Moussa Biosphere Reserve, following UNESCO Man and Biosphere guidelines, to the concerned municipalities and landowners (to be able to rent the land), to the MoE. An application was subsequently submitted to UNESCO to designate Jabal Moussa as a biosphere reserve.

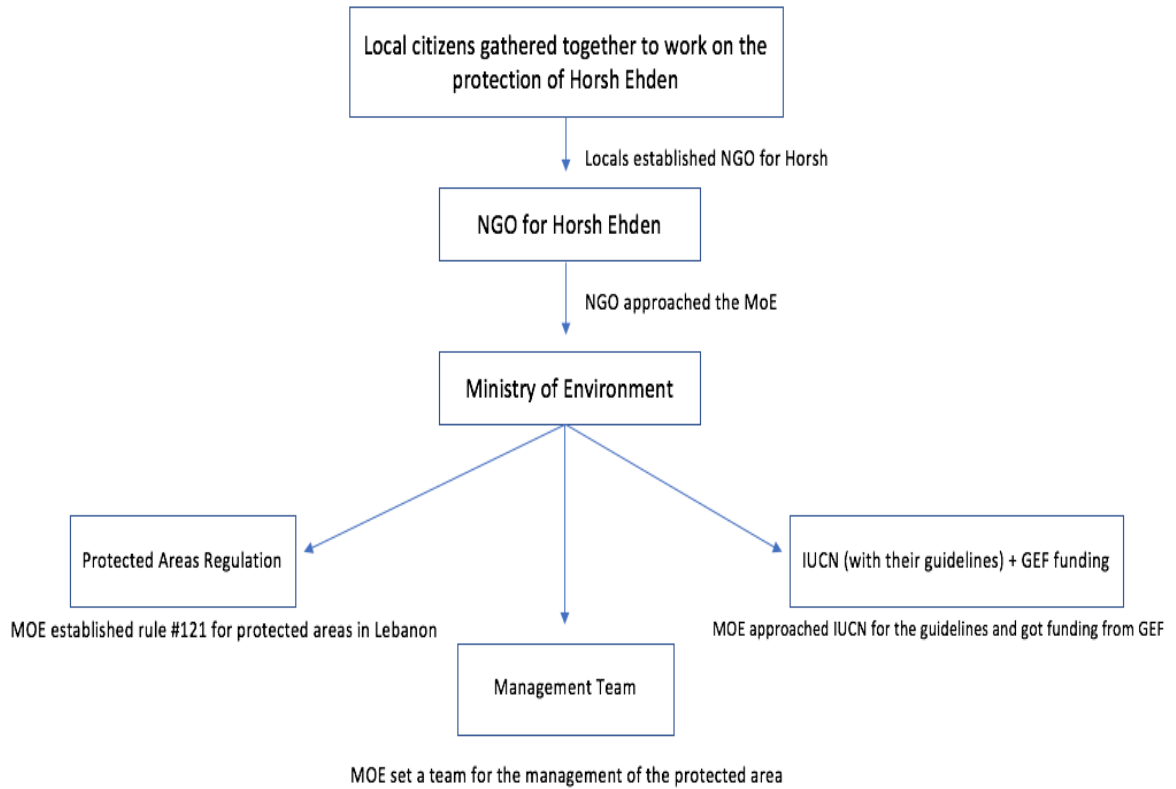


Figure 6: Governance structure of Horsh Ehden Protected Area

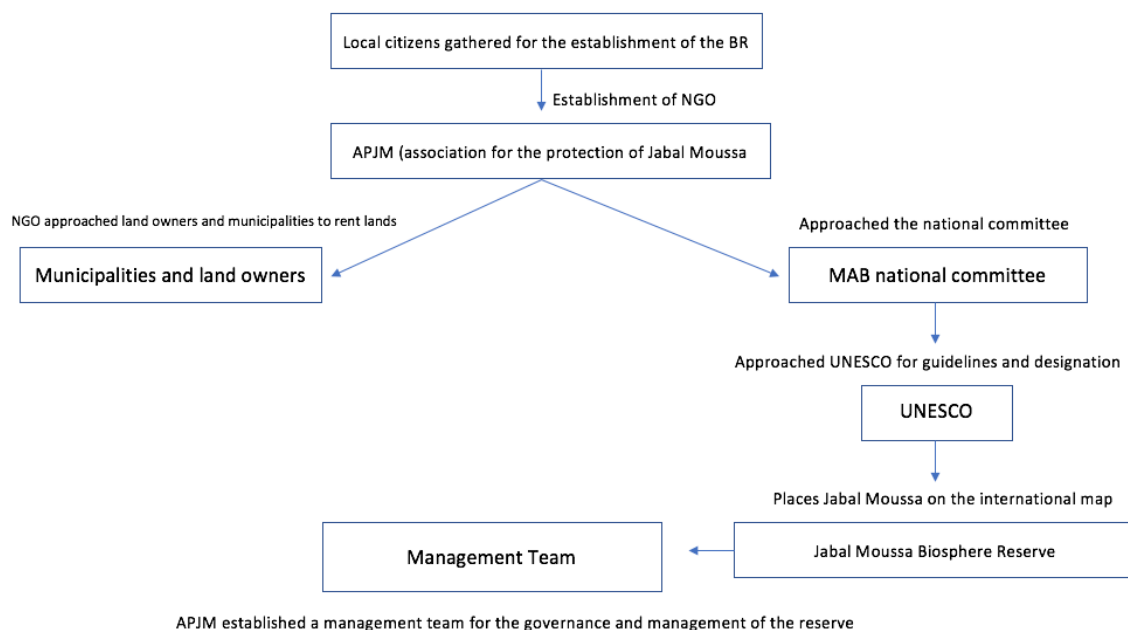


Figure 7: Governance structure of the Jabal Moussa Biosphere Reserve



Figure 8: UNESCO certificate of Jabal Moussa (<https://www.jabalmoussa.org>)

C. Governance

When the Horsh Ehden was established as a protected area in 1996-1997 with funding from GEF, a management team was assigned by the Ministry of Environment. The management team included a representative of the ministry, of the newly established NGO, of the IUCN, in addition to field staff. The field staff worked with international experts to formalize the establishment of the Horsh Ehden protected area based on IUCN criteria. When funding came to an end, the MoE mobilized its human

and financial resources to help manage and fund the protected area because the public lands of the PA are under its supervision. The mayor of Ehden was assigned as head of the NGO to facilitate a flow between the reserve and the municipality of Ehden. The newly established NGO took on the management responsibilities and included 2 representatives from Zgharta municipality, 2 Eco tourists, 2 NGO representatives, and field staff from the PA.

The Horsh Ehden PA management team established its own management plan which included a vision, objectives, and a work plan on ecotourism, reforestation, scientific research, awareness, and education within different sectors to ensure the maximum efficiency and protection of the reserve. The reserve submits monthly reports to the MoE (whose main job is planning, strategizing, funding, and supervising) as well as an annual report about activities, staff, studies, infrastructure, etc. to funding organizations and donors.

The NGO established for the protection of Jabal Moussa Biosphere Reserve assumed the responsibility of the BR management since its creation. All NGO members are field staff and residents that act as managers, rangers, guides, and guards. As the operation grew the NGO hired more residents. Since its inception, the management team focused on recruiting people from different expertise to work on the protection and conservation of Jabal Moussa. Unlike Horsh Ehden PA, the management plan of Jabal Moussa BR focuses equally on the protection of land and livelihood of residents while the management plan of Horsh Ehden PA focuses primarily on conservation and restoration. According to an interviewee, the management plan is developed in coordination with municipalities and landowners, and in coordination with the ministries of Environment, Agriculture, and Culture who hold various authorities on the

BR lands. The management team submits annual reports to funding agencies, UNESCO, Ministry of interior, ministry of Environment (regarding activities, achievements, and publications), and the Lebanese National Scientific Research (LNCSR) which house the UNESCO MAB national committee

D. Ownership and Regulations

With the official designation of Horsh Ehden as a protected area, the Lebanese parliament issued regulation #121 which classifies Horsh Ehden as an official Lebanese PA (Figure 9). The regulation also states practices that are allowed and those that are forbidden within the boundaries of the protected area such as cutting trees, and performing any work or action, which interferes with the natural equilibrium of the reserve. The ministry of environment supervises appointments, and the management can recruit experts on need basis.

النظام الداخلي للجنة الوزارية
لمحمية حرش اهدن الطبيعية

المادة ١: أصول تعيينها، تأليفها و هيكلتها

- أ- يتم تعيين أعضاء اللجنة من قبل وزير البيئة بموجب القانون ٩٢/١١٢ و ذلك لمدة ثلاث سنوات.
- ب- تختار اللجنة فور تعيينها أو عندما تدعو الحاجة، من بين أعضائها شخصا لكل من المسؤوليات التالية: نيابة الرئاسة، أمانة السر، أمانة الصندوق، الإعلام، العلاقات العامة و التنسيق، الشؤون الفنية.
- ج- يجري سنويا إعادة تشكيل مكتب اللجنة من قبل أعضائها بإنتخاب رئيس جديد و إعادة توزيع المسؤوليات الواردة آنفا. يمكن لأي من الأعضاء شغل المنصب نفسه مرات عدة متتالية.
- د- إذا خلا أكثر من مركز عضوية واحد في اللجنة و كان يتبقى من مدة ولايتها أكثر من سنة، وجب تقديم طلب إلى سلطات الوصاية بتعيين أعضاء لملء الشغور.
- هـ- في جميع الأحوال، تستمر اللجنة و يستمر الأعضاء في ممارسة مهامهم، بعد إسناد حقيبة المركز الشاغر إلى أحد الأعضاء الآخرين، حتى يصار إلى تعيين الأعضاء الجدد. لا يمكن إسناد أكثر من مهمتين لعضو واحد في اللجنة، على ألا يصار إلى تراكم حق تقرير و تنفيذ صرف الأموال عند العضو نفسه في أي من الحالات.
- و- فور تشكيل مكتبها بتوزيع المهمات بناء على بنود هذه المادة، تعلم اللجنة مكتب وزير البيئة خطيا بذلك. كذلك على أمانة السر إيداع مكتب الوزير نسخة عن النظام الداخلي و تعديلاته، و إعلامه بأي تعديل أو تبديل في هيكلية اللجنة.
- ز- للجنة، كلما دعت الحاجة، تأليف لجان فرعية متخصصة بالإشتراك مع أخصائيين أو مهتمين بشأن المحمية للمساعدة في إتمام المهام الموكلة إليها.
- ح- يمكن أن تتعاقد اللجنة، بالتنسيق مع سلطة الوصاية و وفق الآلية و الشروط المحددة في الملحق رقم (١) المرفق بقرار تعيين اللجنة، مع فريق عمل منفرغ لإدارة المحمية يكون مسؤولا عن التنفيذ العملي للنشاطات المتعلقة بالخطة الإدارية للمحمية (Plan de Gestion/Management Plan) يعمل على مسؤولية اللجنة و بإشرافها.

(إنتهت المادة ١ عن ٨ بنود)

اللجنة الوزارية-حرش اهدن
النظام الداخلي

صفحة ١ من ١٠

Figure 9: Page 1 of regulation #121 issued by Lebanese parliament for protected areas
(Source: Study Respondent)

Unlike Horsh Ehdén which are public government lands, the lands of Jabal Moussa are owned by the Maronite Church, the Ghbale Municipality, and Yahchouch Municipality. The management team rents the lands of the designated core zone of the Jabal Moussa BR. There is no authority and minimal interference from the ministry of environment who regulates activities in areas designated as natural.

The protection of Jabal Moussa follows different regulations depending on stakeholder. For example, the protection is based on regulation #7494 in the Lebanese Parliament, decisions number 13 and 3 from the ministry of culture, and decision number 299/1 from the ministry of agriculture (Figures 10, 11, 12, 13). The protection of each area of the core zone was formalized through different regulations by different entities. As a result, Jabal Moussa BR holds separate recognitions from different municipalities who assign different zones for conservation as, a protected forest, a natural area, and a historical area. Once all approval were secured and the management plan finalized, the NGO applied to UNESCO to include Jabal Moussa BR under the MAB program.

مرسوم رقم ٧٤٩٤

تحديد وتصنيف جبل موسى في بلدة نهر الذهب في قضاء كمرون كموقع طبيعي

إنت رئيس الجمهورية بناء على الدستور

القانون رقم ٢١٦ تاريخ ١٩٩٣/٤/٢ (أحداث وزارة البيئة) لاسيما المادة الأولى منه	بناء على
القانون رقم ٦٩٠ تاريخ ٢٠٠٥/٨/٢٦ (تحديد مهام وزارة البيئة وتكليفها)؛	بناء على
القانون رقم ١٩ تاريخ ١٩٩٠/١٠/٣٠ (الانضمام لبنان الى اتفاقية الأونسكو)؛	بناء على
قانون حماية المناظر الطبيعية تاريخ ١٩٩٩/٧/٨،	بناء على
المرسوم رقم ٢٢٧٥ تاريخ ٢٠٠٩/٦/١٥ (تنظيم الوحدات التابعة لوزارة البيئة وتحديد ملاكها وشروط التعيين الخاصة في بعض وظائفها)؛	بناء على
اقتراح وزير البيئة؛	بناء على
استشارة مجلس شوري للدولة بموجب الرأي رقم ٢٠١١-٢٠١٠/١١٤ تاريخ ٢٠١١/٢/١٧	وبعد

يرسم ما يأتي:

المادة الأولى: يحدد ويصنف الموقع المعروف بجبل موسى - الواقع في بلدة نهر الذهب - قضاء كمرون - محافظة جبل لبنان من المواقع الطبيعية المحمية الخاضعة لحماية وزارة البيئة.

المادة الثانية: يشمل الموقع الطبيعي الحدود التقريبية للموقع المبنية باللون الاحمر. على الحرائط (١-١) و(٢-١) و(٣-١)، التي تعشر جزءه لا يتجزأ من المرسوم. كما يشمل الموقع الطبيعي العقارات ذات الأرقام /٣٤٢/، /٣٤٤/، /٣٤٥/، /٣٤٦/، /٣٤٧/، /٣٤٨/، /٢٨٦/، /٣٣١/، /٣٣٢/، /٣٣٣/، /٣٣٤/، /٣٣٥/، /٣٣٦/، /٣٣٧/، /٣٣٨/، /٣٤٩/ من منطقة نهر الذهب العقارية.

المادة الثالثة: تحدد وزارة البيئة الشروط البيئية للترخيص لأية إنشاءات و/أو اشغال في الموقع الطبيعي المذكور ضمن إطار تدابير الحماية التي تراها الوزارة ضرورية. فيما يتعلق بالمقالع والكسارات، يتم تطبيق شروط الأبعاد المنصوص عليها في النصوص القانونية المتعلقة بتنظيم المقالع والكسارات. يمكن ان تخضع الإنشاءات و/أو الأشغال في الموقع الطبيعي، اذا رتت وزارة البيئة ذلك ضروريا، الى دراسة تقييم الأثر البيئي او فحص بيئي مبدئي لمراجعتها من قبل وزارة البيئة والموافقة عليها او عدمها، وفي حال

Figure 10: Regulation 7494 in Lebanese Parliament to legalize Jabal Moussa as a Lebanese Biosphere Reserve (<https://www.jabalmoussa.org>)

قرار رقم ١٣

إدخال القسم ٣ من العقار رقم ١٩٢٦ من منطقة ميروبا العقارية - قضاء كسروان - محافظة جبل لبنان في لائحة الجرد العام للأبنية التاريخية

إن وزير الثقافة

بناء على المرسوم رقم ٣ تاريخ ٢٠١٦/١٢/١٨ (تشكيل الحكومة)،
بناء على القرار رقم ١٦٦/ل.ر تاريخ ١٩٣٣/١١/٧ وتعديلاته (نظام الآثار القديمة)،
بناء على كتاب جمعية حماية جبل موسى المسجل لدى المديرية العامة للآثار برقم ٣٩٩٠ تاريخ ٢٠١٦/٩/٢ المتضمن طلب إدخال العقار رقم ٣/١٩٢٦ من محلة مراح الديب في منطقة ميروبا العقارية - قضاء كسروان - محافظة جبل لبنان نظراً لاحتوائه على جدار أثري وجرن صخري وأتونين وعدد كبير من القطع الفخارية من العصر الروماني،
بناء على تقرير المديرية العامة للآثار رقم ٣٩٩٠ تاريخ ٢٠١٦/١٢/٨ المتضمن نتيجة الكشف على هذا العقار حيث تبين أهميته من الناحية الأثرية،
بناء على اقتراح المدير العام للآثار،

يقرر ما يأتي:

المادة الأولى: أدخل في لائحة الجرد العام للأبنية التاريخية القسم ٣ من العقار رقم ١٩٢٦ من محلة مراح الديب في منطقة ميروبا العقارية - قضاء كسروان - محافظة جبل لبنان وفقاً لما هو مبين باللون الأحمر على الخريطة المرفقة.

المادة الثانية: لا يجوز القيام بأي عمل من شأنه تغيير الوضع الحالي على العقار المذكور دون موافقة المديرية العامة للآثار المسبقة على الأعمال المنوي إجراؤها والمواد المنوي إستعمالها.

المادة الثالثة: ينشر هذا القرار في الجريدة الرسمية ويبلغ الى الدوائر العقارية والسلطات الإدارية المختصة.

بيروت في ٢١ شباط ٢٠١٨



تبلغ إلى:

- المديرية العامة للشؤون العقارية - أمانة السجل العقاري في جونبة
- المديرية العامة للتنظيم المدني
- المديرية العامة لقوى الأمن الداخلي
- محافظة جبل لبنان - قانمقامية كسروان
- بلدية ميروبا - المالكين بواسطة البلدية
- الجريدة الرسمية
- المديرية العامة للآثار - الديوان - المحفوظات

المديرية العامة للآثار - طريق المتحف - بيروت، لبنان

هاتف: ٠٣ ٤٢ ٦٧ ٠٣ + فاكس: ٠٩ ٢٢ ٦١ ١ ٩٦١ +

Figure 11: Rule #13 to categorize Mayrouba as a Historical Site in Jabal Moussa BR (<https://www.jabalmoussa.org>)

الجمهورية اللبنانية

وزارة الثقافة
المديرية العامة للأثار

قرار رقم ٢ :
تاريخ
المشروع ١٤ :
٢٠١٢

إدخال العقارات ذات الأرقام 275 و276 و282 و283 و286 و287 و330 و331 و332 و335 و337 و338 و342 من منطقة نهر الذهب العقارية- محافظة جبل لبنان في لائحة الجرد العام للأبنية التاريخية.

موافق
المهندس
خالد الرفاعي



نظمتها
المهندسة
أسامة الكلاب



نظرو وصدق
وزير الثقافة
الإمضاء : المهندس كاسي ليون

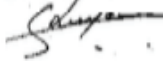


Figure 12: Rule #3 to categorize the real estates listed above as a historical site in Jabal Moussa (<https://www.jabalmoussa.org>)

المادة الثالثة: يمنع منعاً باتاً قطع الأشجار أو إزالتها أو تفريدها. يستثنى من هذا المنع الأعمال والأبحاث التي تقوم بها مصلحة الأحراج والمراكز البحثية وجمعية حماية جبل موسى والتي تهدف الى صيانة النظم الإيكولوجية بكامل مكوناتها وصيانة الدروب والحماية من إندلاع الحرائق.

المادة الرابعة: يمنع دخول المواشي وسائر الحيوانات الداجنة الى المحمية.

المادة الخامسة: يمنع الصيد بكافة أنواعه ضمن المحمية وعلى مسافة لا تقل عن ٥٠٠م عن حدودها.

المادة السادسة: يمنع التجوال خارج الدروب المحددة ضمن المحمية، كما يمنع إضرام النار أو التخميم أو رمي النفايات أو قلع النباتات البرية.

المادة السابعة: يطبق على العقارات التي تقع عليها المحمية الأحكام الواردة في القانون رقم ٥٥٨ تاريخ ١٩٩٦/٤/١٩.

المادة الثامنة: تتولى مصلحة الأحراج الإشراف على هذا الحمى والعمل على المحافظة على الأحراج والنباتات البرية وطرائد الصيد والطيور والحيوانات البرية فيه.

المادة التاسعة: تتولى البلديات المعنية تعيين نوابير لهذا الحمى وذلك بالتنسيق مع جمعية حماية جبل موسى بعد موافقة مصلحة الأحراج.

المادة العاشرة: ينشر هذا القرار و يبلغ حيث تدعو الحاجة.

بيروت في : ١٨ - ٩ - ٢٠١٨



تبلغ نسخة إلى:

رئاسة مجلس الوزراء
التفتيش المركزي
وزارة البيئة
وزارة الداخلية والبلديات
المجلس الوطني للبحوث العلمية
محافظة جبل لبنان
الجريدة الرسمية (للتفضل بالنشر)
مديرية التنمية الريفية والثروات الطبيعية
مصلحة زراعة جبل لبنان
المحفوظات

مخالفة رأي وزارة البيئة تطبيق احكام القانون رقم ٤٤٤ تاريخ
٢٠٠٢/٧/٢٩ قانون حماية البيئة لا سيما المادة الثامنة والخمسون منه.

المادة الرابعة: تقدم وزارة البيئة طلباً إلى المجلس الأعلى للتنظيم المدني لوضع المواقع
الطبيعي المذكور تحت الدرس وإجراء الدراسات التنظيمية اللازمة للموقع
الطبيعي وإدراج تصنيفه في المخطط التوجيهي للمنطقة.

المادة الخامسة: ينشر هذا المرسوم ويبلغ حيث تدعو الحاجة.

بعبدا في ٦ شباط ٢٠١٢
الامضاء : ميشال سليمان

صدر عن رئيس الجمهورية
رئيس مجلس الوزراء
الامضاء : محمد نجيب ميقاتي

وزير البيئة
الامضاء : ناظم الخوري

قرار رقم ٢٩٩/١

إنشاء غابة محمية في جبل موسى

إن وزير الزراعة،

بناء على المرسوم رقم ١٨ تاريخ ٢٠٠٨/٧/١١ (تشكيل الحكومة)

بناء على المرسوم الإشتراعي رقم ١١١ تاريخ ١٢ حزيران ١٩٥٩ (تنظيم الإدارات العامة)،

بناء على المرسوم الإشتراعي رقم ١٣٠ تاريخ ١٢ حزيران ١٩٥٩ (أحكام خاصة تتعلق بوزارة

الزراعة وشروط التعيين الخاصة بها)

بناء على المرسوم رقم ٨٣٧١ تاريخ ١٩٦١/١٢/٣٠ (تنظيم وزارة الزراعة لا سيما المادتين ١٧

و ١٩ منه)،

بناء على المرسوم رقم ٥٢٤٦ تاريخ ١٩٩٤/٦/١٢ وتعديلاته (تنظيم وزارة الزراعة)

بناء على القانون رقم ٥٥٨ تاريخ ١٩٩٦/٤/١٩ (حماية الغابات)،

ولما كانت جمعية حماية جبل موسى قد قامت بدراسة الأهمية البيئية فيه، وتقدمت بتاريخ

٢٠٠٨/٨/٨ بطلب إنشاء محمية في غابة جبل موسى،

وبعد موافقة المجلس البلدي في غباله على إنشاء محمية ضمن العقارات التابعة لمشاع البلدة

والواقعة ضمن منطقة نهر الذهب العقارية،

وبناء على إقتراح مدير عام الزراعة بالإنابة،

يقرر ما يلي:

المادة الأولى: ينشأ حمى وطني (غابة محمية) في جبل موسى ضمن العقارات ٣٤٥، ٣٤٦ و ٣٤٧ من منطقة نهر الذهب العقارية.

المادة الثانية: تقوم مصلحة الأبحاث بالتنسيق مع جمعية حماية جبل موسى بوضع خطة لإدارة غابة جبل موسى.



Figure 13: Decision #299/1 for the establishment of a protected forest in Jabal Moussa (Source: <https://www.jabalmoussa.org>)

E. Perspective of Residents

Residents, according to one interviewee, were not supportive of the protected area status of Horsh Ehden when it was first established because access rights were taken away from them. As a first step, the management team closed all access to the reserve putting a halt to grazing, hunting, picnics, etc. According to the interviewees, with time, the residents became more accepting as they began to benefit from the designation of Horsh Ehden as a protected area. The management of the protected area continued its evolution throughout the years, in terms of management, tourism, plans, and trails, as a result, the residents' perception towards it was improved. Residents benefit from the reserve directly through selling goods and gifts to visitors and indirectly by the local economy that benefits the village tourism sector namely food and lodging.

The transformation of Jabal Moussa into a conservation area also led to disputes as residents were also denied access rights.

One of the interviewees mentioned that

... “The people became completely against it when they found out we would not be allowing them to cut wood from the forest because they depended on that business, we also stopped random grazing and hunting in the reserve and of course we would be forbidding quarrying. So, the people were completely against this reserve because we were a barrier to their income. The people were so furious at first that they tried to harm us in different ways such as burning out stands and entrances, the first 5-6 years were very hard”.

Eventually the reserve became an employer of some residents, many became guides, others in the activities (learning about the flowers, picking plants, etc.).

F. Tourism, Activities, Projects, and Education

According to interviewees, Horsh Ehden PA and Jabal Moussa BR have increased tourism in the region. As Horsh Ehden PA management team developed new trails and improved existing trails and tracks, the number of tourists increased with time and today the Horsh Ehden PA attract local and international visitors. In addition, the Horsh Ehden PA management team has secured funding from international donors for projects such as tree planting, trail maintenance and fire emergency missions. Present and future projects for the reserve include reforestation, seed banking and germination, as well as studies of insect and plant biodiversity. With respect to education, the management team has two strategies: targeting youth by organizing school visits to the PA, where school children hike through the reserve, and targeting national and international audiences through participation in conferences where they focus on awareness and talk about the importance of Horsh Ehden PA. The management team also spreads awareness through the help of their active stakeholders by talking about the reserve on TV programs, radio stations and social media.

The past decade, according to interviewees, has seen a major growth for Jabal Moussa BR, which has gained increasing recognition. The main activity in the reserve is hiking which first started with 3 trails and has now a total of 15 trails. In addition, visitors can engage in reforestation, visit the nursery, volunteer, learn beekeeping and buy local products. Two resident's houses in Jabal Moussa BR have been transformed into guest houses.

Jabal Moussa has attracted funding to support national and international projects such as conservation of endemic species, capacity building for education in UNESCO's biosphere reserves, cultural preservation.

These projects were an opportunity for people to conduct research and learn about what is found in the reserve. As for education, the management team participates in worldwide campaigns and conferences as well as school visits to raise awareness among the younger generation. Jabal Moussa management team has set up a website which helps people know more about the biosphere reserve, the trails, research published and some historical evidence found in the reserve.

	Horsh Ehdén	Jabal Moussa
Management Plan	✓	✓
Logo	✓	✓
Website	X	✓
Social Media	✓	✓
Entrance fees	✓	✓
Educational Programs	✓	✓
Funded Projects	✓	✓
Research Funding	X	X

Table 1: Comparison of activities and projects between Horsh Ehdén and Jabal Moussa (Source: Study respondents)

Activities and projects	Horsh Ehdén	Jabal Moussa
Hiking	✓	✓
Snowshoeing	✓	X
Seed banking	✓	X
Reforestation	✓	X
Planting	✓	✓
Volunteering	✓	✓
Beekeeping	X	✓

Table 2: Comparison of activities and projects between Horsh Ehdén and Jabal Moussa (Source: Study respondents)

# of Visitors in the past 3 years	Horsh Ehdn	Jabal Moussa
Year 2018	16000	28647
Year 2019	20000	29711
Year 2020	18000	40091

Table 3: Comparison between the total number of visitors in Horsh Ehdn and Jabal Moussa in the past 3 years (Source: Study Respondents)

CHAPTER IV

DISCUSSION

Desk research revealed that when establishing a BR or a PA, different criteria are considered (Appendix E). The UNESCO MAB has set the following criteria for an area to be considered as a biosphere reserve (Pool-Stanvliet et. al, 2018):

1. It should encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human interventions.
2. It should be of significance for biological diversity conservation.
3. It should provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale.
4. It should have an appropriate size to serve the three functions of biosphere reserves.
5. It should include these functions, through appropriate zonation, recognizing:
 - a) A legally constituted core area or areas devoted to long-term protection, according to the conservation objectives of the bio- sphere reserve, and of sufficient size to meet these objectives;
 - b) a buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the conservation objectives can take place;
 - c) an outer transition area where sustainable resource management practices are promoted and developed.

6. Organizational arrangements should be provided for the involvement and participation of a suitable range of inter alia public authorities, local communities and private interests in the design and carrying out the functions of a biosphere reserve.

7. In addition, provisions should be made for:

- a) Mechanisms to manage human use and activities in the buffer zone or zones;
- b) A management policy or plan for the area as a biosphere reserve;
- c) A designated authority or mechanism to implement this policy or plan;
- d) Programs for research, monitoring, education and training.”

Criteria for the establishment of a protected area are contained in Article 4 of the SPAW protocol (The Protocol for Specially Protected Areas and Wildlife) (UNEP, 1996)

1. The establishment of protected areas, in the widest sense, implies the establishment of well-defined, clearly-marked boundaries, their legalization in keeping with existing national mechanisms, and their effective management under a protection regime which gives due consideration to the natural, historical, cultural and socio-economic resources of the area.
2. As part of the process of establishing new protected areas, or improving existing ones, the Governments should undertake a study of the legal and institutional systems and identify any changes -that might be necessary to fulfill the national conservation objectives. This includes the legal and organizational measures that are intended to increase the responsibility and participation of local populations with respect to the management of protected areas as well as to allow for proper financing through the different possible mechanisms.

3. In developing plans and national budgets Governments should bear in mind that the establishment of new protected areas or the improvement of existing ones may be facilitated by consolidating the management capacity of the institutions responsible for the protection and management of those areas.
4. Traditional rights and interests shall be respected. The areas of indigenous groups and local communities shall be protected from activities that are considered to be socially, ecologically or culturally inappropriate.
5. Governments should consider offering incentives for the establishment of protected areas owned or administered by or in cooperation with the private sector and non-governmental organizations. International experience has shown an increasing trend in the management of protected areas by community groups, NGO's, academic and research institutions, and private institutions which are making valuable contributions to the conservation of biodiversity.

Notwithstanding this, the Governments should monitor the management of these areas, which must be guided by national conservation objectives and strategies.
6. When establishing new protected areas and improving existing ones, Governments should give priority to those that need to be recognized within the framework of existing international or regional programs and agreements, as part of the global efforts being undertaken for the conservation of global biodiversity and world heritage.
7. As part of the process of establishing protected areas for biological conservation, Governments should undertake an evaluation outlining the economic importance of conserving these areas for activities such as fisheries, forestry, water supply, coastal protection, tourism, recreation, agriculture or soil conservation. This is a

key consideration in the decision-making process, as the protection of sites is likely to be more successful when economic benefits can be demonstrated.

A content analysis of the above revealed key differences at the level of area under protection, contribution to sustainability, government involvement, management mechanisms, and conservation view (Table 4).

	BR	PA
Area under protection	three zones	one zone
Contribution to sustainable development	showcase sustainable development	assess sustainable development
Government involvement	organizational arrangement including government	government seeks partnerships
Management mechanism	management is local	management is participatory
Conservation view	assigning BR with local view	assigning PA with international view

Table 4: Key differences observed following desk research of criteria for establishing biosphere reserves and protected areas (Pool-Stanvliet et. al, 2018; UNEP, 1996)

The first difference observed between the two sets of criteria is the zonation. In BRs the focus is on contextualizing the area rich in biodiversity and in need of protection within two additional zones, the buffer zone which shows continuity, and the transition zone which focuses on sustainable development and the residents. This indicates that the biosphere reserves focus on areas that need strict protection and view them as part of a gradient zone which experiences increased human intervention. On the other hand, in protected areas the focus is primarily on the area that needs protection as PAs' priorities are primarily focused on the protection of nature.

It is worth mentioning that the Al Shouf Reserve was initially established as a protected area at the same time as Horsh Ehden PA. Later the management team expanded their conservation reach by establishing the Al Shouf Biosphere Reserve. The PA was later turned into a BR because they expanded their activities into 3 different zones of protection after receiving the approval and support of the local authorities in the region.

The second difference is the focus of BRs on sustainable development. With BRs the consideration is that to protect any area, sustainable development practices should be showcased. With PAs sustainable development is an aim, but it is not considered a core priority as conservation comes first.

Thirdly, BRs are the result of an organizational arrangement that includes the public sector, whereas PAs are established by governments that seek partnership with local authorities and civil society. This means that in PAs the government partners up with the local NGO and local community whereas BRs local authorities and civil society are in charge of the organizational arrangement.

A final difference is the designation of Biosphere reserves and Protected areas. A Biosphere reserve has a national and regional importance, it “Encompass a mosaic of ecological systems representative of major biogeographic regions including a gradation of human interventions” (Pool-Stanvliet et. Al, 2018). A protected area is assigned by government who “should give priority to those that need to be recognized within the framework of existing international or regional programs and agreements, as part of the global efforts being undertaken for the conservation of global biodiversity and world heritage” (UNEP, 1996).

The in depth interviews with various stakeholders revealed further similarities and differences between Jabal Moussa BR and Horsh Ehden PA at the level of governance structure, type of land ownership, and governmental oversight.

The governance of both Jabal Moussa BR and Horsh Ehden PA is dependent on a bottom-up approach by their local NGOs which were initially formed with specific missions to conserve and manage the areas under protection and subsequently acted as the management teams. This bottom-up governance approach by both entities is in line with reported governance of protected areas, which were also historically established by governments, and were subsequently governed through a community based approach (Eklund & Cabeza, 2017). With respect to governance structure, the Horsh Ehden PA and Jabal Moussa BR differ in that the former falls under a national government entity, specifically the ministry of environment, while the latter is under the UNESCO Man and Biosphere program. As a result, the Horsh Ehden PA reports on different projects, management activities and tourism activities to the MOE, which is bound to provide financial support and ensure sound management of the protected area. On the other hand, the management team of Jabal Moussa BR is required to report to a national committee representative of an international organization, UNESCO, which in turn reports to the UNESCO Man and Biosphere. In addition, the Jabal Moussa BR management team reports to the government of Lebanon, in this case the ministry of environment, and since the BR is established on private lands, the team is also required to report to the ministry of agriculture and the ministry of culture. This multiple reporting to different organizations, and the fact that the management team of Jabal Moussa BR oversees both development and management in the absence of public sector support does not seem to be the case for other BRs. For example, in Japan BR

management is shared between municipalities that are drivers of development activities and the central government which manages conservation activities (Tanaka & Wakamatsu, 2017).

The responsibility of planning and management of both Jabal Moussa BR and Ehden PA is with the local management teams. The government of Lebanon has aligned its approach with other countries by shifting the weight of planning and management responsibilities to the local management team and giving them space to take matters into their own hands. A ten-year review of protected area governance revealed that governments are beginning to devolve responsibilities and provide legible space for others to participate in the management of PAs (Balasinorwala, 2014).

With respect to institutional influence on the establishment management and reporting requirements, the study revealed that IUCN influences protection through information sharing of guidelines for PA establishment and management and provides technical support, without engaging directly with the governance of PAs or requiring formal reporting. In contrast, UNESCO, which also provides guidelines for the establishment and management of BRs, maintains long term oversight on the BR by making reporting mandatory. The study also revealed that the technical guidelines and support provided by IUCN are standardized and require adherence to protection protocols while guidelines provided by UNESCO are flexible and vary with country and context. The management teams of protected areas plan and implement projects following IUCN guidelines for PA management (Fauchald & Gulbrandsen 2012). The IUCN global program for protected areas is responsible for providing experts who are in charge of guiding the establishment of a protected area and assigning it to a protected areas management category to ensure a proper establishment and long term protection

goal following set guidelines (Day et al., 2012). Once a designated area is protected, reporting should be done to UNEP WCMC (world conservation monitoring center) to include the newly protected area in the WDPA (World Database on Protected Areas) (<https://www.iucn.org/theme/protected-areas/our-work/quality-and-effectiveness/world-database-protected-areas-wdpa>). This global protected area program is a collaboration between UNEP and IUCN who in turn collaborate with governments and NGOs to support the management of PAs following the IUCN PA management guidelines. However, subsequent reporting of governments to the UN database is voluntary (but highly recommended) (Day et. al, 2012). On the other hand, in the case of BRs, the International Coordinating Council (ICC) of UNESCO in collaboration with the Advisory Committee for Biosphere Reserves (ACBR) set the guidelines for BRs. However, these guidelines are modified depending on the country context of the BR. These guidelines are revised and finalized by a regional committee and a national committee before they are shared with the management team in charge of the BR. Unlike IUCN who recommends regular submission of reports, UNESCO requires BRs to submit yearly reports to the MAB regional networks who in turn report back to the World network of BRs and update their database (Schliep & Stoll-Kleeman, 2009)

Land ownership is another notable difference between the Horsh Ehdén PA that occurs on public lands and the Jabal Moussa BR that is established on private lands. This difference may be peculiar to the case study areas because both IUCN and UNESCO MAB protection guidelines include information on the protection and management of private lands (Borrini-Feyerabend, 2007; WBR, 2020). The impact of the type of land ownership is mostly on governance and reporting. Based on IUCN guidelines, protected areas on public lands are controlled by a government body, usually being the ministry of environment, who owns the land, and has the responsibility and

accountability over the management of the area (Borrini-Feyerabend, 2007). Protected areas in Cambodia for example, are all under the responsibility of the ministry of environment, who manages and supervises protected areas in coordination with the management team of each PA. The law on protected areas in Cambodia give the MoE the right to be in charge of the management plan, management team well as inspection of the PA (ODC, 2020) similar to that of the case of Cambodia, Horsh Ehden being a public land, its ownership is completely under the MoE, who is responsible for the management and supervision of the selected area.

Similarly, the UNESCO MAB makes provision for the conservation of privately owned lands (WBR, 2020). For example, biosphere reserves in Africa are privately owned and decision making teams are made up of different stakeholders including landowners, researchers, and national and public (ministries) authorities (Hedden-Dunkhorst & Schmitt, 2020). To accommodate for the conservation of private lands, the government of Lebanon follows laws and regulations established by ministries for the protection of biosphere reserves however, none specifically cater to biosphere reserve governance. For example, the core area of the biosphere reserve is designated by the ministry of agriculture as a protected forest, the ministry of environment issued a decree to assign Jabal Moussa area as a Natural site, it is also protected by the ministry of culture issued to conserve its rich historical and cultural lands (Karam, 2019). As a result, the responsibility of the Jabal Moussa BR management team is complex as it has to address this lack of intergovernmental clarity and alignment through redundancy and multiple reporting and negotiations to fulfill the requirements of three ministries, namely environment, agriculture, and culture in addition to the land owners.

The study revealed that with respect to government oversight and support, the management teams of both Jabal Moussa BR and Horsh Ehden PA carry the weight of fundraising and as such have relied on regional and international networking and grant writing to secure income for the implementation of management strategies. This shift in the responsibility for the management of protected areas by management teams rather than government entities has been reported in other countries (Balasinorwala, 2014) and has led the PA management teams to establish new and independent strategies to generate income from international funds and entrance fees. Below are examples of project funding secured by management teams of both Jabal Moussa BR and Horsh Ehden PA.

Projects	Description
Jabal Moussa BR	
Hinterland Archaeological Heritage in Jabal Moussa UNESCO Biosphere Reserve 2019-2021	Cultural Heritage / Tourism: The aim of this project is to valorize the tremendous efforts done since the funding of the first cultural project in 2015; clear and conserve new sites or new site extensions; study and showcase through drawings and explaining the archaeological evidence
Cultural Routes for sustainable social and economic development in Mediterranean 2019-202	Cultural Heritage/ Tourism/ Socio-economic development: The project's objective is contributing to the economic and social development in the Mediterranean, strengthening and enhancing sustainable tourism practices, emphasizing common heritages and resources. Specifically, it expects to increase touristic competitiveness & attractiveness of less known destinations, rural/depressed areas, adopting/enhancing the Cultural Routes concept/experiences in selected areas of 4 countries

Conservation of Lebanon Endemic Flora through Community Engagement 2019-2020	Conservation: Develop a participatory planning approach to ensure the conservation of endemic plants in Lebanon. Strengthen the capacities of protected area managers and improve management plans for plant conservation in Jabal Moussa and Eden Forest. Support local conservation action, possibly with micro-reserve, for rare plants of Kneisseh summit and Makmel heights
EduBiomed- Capacity Building for education and applied research in Mediterranean UNESCO's Biosphere reserve 2018-2021	Research/education: Strengthening, ameliorating and upgrading academic activities at Higher Education Institutions in the context of Mediterranean Biosphere Reserves (BR) - Exploiting innovative technologies in BR Education, Research and Management
Horsh Ehden PA	
Adaptation measures to counterpart climate change effects on Biodiversity in Horsh Ehden Nature Reserve 2018-2021	Ecological: This project aims for the elaboration of an action plan adapted to insect pests that are increasing in Horsh Ehden Nature Reserve in order to mitigate the effects of climate change. The action plan would be a tool to predict and prevent possible outbreaks of insects.
WFP livelihood project 2020	Ecological: Create communities, elevate the impacts of climate change and support Lebanon's most vulnerable. Leaving no one behind, these interventions are a common ground for people from different backgrounds to build valuable assets together.

Planting the Seed of Opportunity	Ecological: The World Food Programme (WFP) is running a project with the aim of equipping participants who come from different backgrounds with theoretical and practical skills they need to master forest management techniques. WFP is upgrading the reserve's nursery and seed collection processes, mulching seedlings, cleaning road edges to prevent forest fires as temperatures begin to rise and planting more than 20,500 seedlings.
Ehden Reforestation Project	Ecological: reforestation project to plant trees all over the PA

Table 5: Jabal Moussa BR and Horsh Ehden PA projects in the past 5 years (2018-2021)

Research is a very important aspect in protection and conservation of the environment, whether protected areas or biosphere reserves, research promotes nature conservation to the audience. Research conducted in conservation areas help people see its importance as well as challenges they face, it contributes in publicizing these areas as well as their biodiversity, it promotes ecotourism and most importantly shows people the value of the natural environment (Laurance, 2013). Both research and researchers highly contribute to the protection and conservation of protected area, in a protected area established in Gabon, research contributed in convincing the government to establish a PA network, in the Nouable-Ndoki protected area in the republic of congo, it was seen that there has been less wildlife poaching in areas that have scientists than those who don't and in protected areas in Central Africa, research promoted education and ecotourism to reduce wildlife hunting (Laurance, 2013). Both Jabal Moussa BR and Horsh Ehden PA have minimal research; instead, the management teams established partnerships with research organizations to generate knowledge that guides

management strategies, helps in ecological restoration, and supports local community participation.

Cooperation and coordination with local community and residents is solicited by both Jabal Moussa BR and Horsh Ehden PA. The main aim of the UNESCO man and biosphere program when first established was to ensure the cooperation and coordination between the biosphere reserve and the people (Boreback, 2013) A study conducted in African biosphere reserves showed that successful management of BRs is valid when local stakeholders including, scientists, farmers and residents, are involved, as they helps contribute to a better environment and management that benefit for both the reserve and the people (de Bisthoven, 2021). Similarly, a study conducted in a PA located in Nicaragua highlighted the importance of the cooperation of locals in conservation areas. According to the study, sustainable management of these protected areas highly depend on the cooperation and support of the locals, they are considered to be the best protectors of the area and could have an important role in opposing environmentally destructive projects such as building dams or mining projects (Saaliskas, 2000). Although community involvement is the objective of both the Jabal Moussa BR and Horsh Ehden PA, the scope of involving and impacting local communities in both cases is still limited in scope and focuses on interventions that primarily benefit the area under protection with minimal benefit to nearby residents. As a result, this leads to dissatisfaction amongst residents as indicated by one of the interviewees mentioned: “They say that they help locals with selling their products like jam, thyme and other products, but the women who prepare them go to the kitchen maybe just 3 times a month and that’s it. They focus a lot on showing visitors how they involve the locals by showing some examples of the products they sell when in fact the

people don't actually work as much as they claim they do." The role of the biosphere reserve is to provide opportunities for the people to engage and benefit from the biosphere as well as give them the opportunity to be part of the conservation of the reserve (Boreback, 2013). However, the application of the man and biosphere reserve, or the active engagement of communities near protected areas are complex concepts that, in Lebanon, cannot be implemented solely by the management teams, and require instead a network of stakeholders and resources that are supported by local and national decision makers.

CHAPTER V

CONCLUSION

This study has explored the differences and similarities between a protected area and a biosphere reserve using Horsh Ehden PA and Jabal Moussa BR as case studies. An investigation of their history, establishment, governance, and current state revealed that they are similar in that they both exclude or partially include local communities. Based on their stated objectives, protected areas and biosphere reserves differ with respect to the conservation scope they call for; while protected areas may exclude or include local communities dependent on the type of protection, biosphere reserves consider protection within a continuum of community involvement. In Lebanon, the Jabal Moussa BR has not yet achieved this continuum and is operating as a protected area without formal government support normally awarded to protected areas, and with the additional burden to secure funds to lease the private lands it is managing. The study revealed a similarity in the efforts both PA and BR put in terms of protection and local involvement. The study also revealed that protected areas and biosphere reserves differ at the level of their governance structure, land ownership, governmental oversight as well as the criteria they are based on.

The study also revealed that the establishment of a biosphere reserve is the result of a local initiative that seeks to protect lands and conserve nature while supporting local livelihoods. The establishment of a protected area occurs when the government is mobilized to conserve land rich in biodiversity or natural heritage. The findings of this study may inform and help guide conservation activists and decision makers who are contemplating land protection.

APPENDIX A

Research Proposal

IRB proposal

Thesis title: Historical overview of biosphere reserves and protected areas in Lebanon

1. Research/study question or hypothesis

Hypothesis: A historical overview of two case studies, a biosphere reserve and a protected area, will inform how these areas evolved into protection. Understanding differences and similarities behind the purpose of protection between the two case studies and the local dynamic including the non-material value will help decision makers contextualize conservation approaches.

Objective: The aim of this research is to develop an understanding of similarities and differences between one protected area and one biosphere reserve in Lebanon based on a historical overview of their development.

2. Recruitment of research participants

The following research will be based on interviews conducted in Jabal Moussa and Ehdén, where the participants will be selected based on their knowledge on the biosphere reserve and protected area. The interviews will be voice recorded by their consent to be able to gather the best information and the most accurate. Questions that will be asked are those only related to the areas and the history of the area.

Participants will be selected using the reputational approach, followed by the snowball technique to be able to pick the knowledgeable people regarding the conservation areas. In order to avoid perceptions of undue influence, contact information of potential subjects will be shared with the investigators, only if approval was sought by the seed participant to share this information. Participants' contact information will be written on a separate list and immediately shredded after the interviews are done.

Due to the corona situation in the country, interviews will be conducted via skype/ whatsapp/ calls for the safety of the participants and the interviewer. The interviewer will provide her information (email, number etc.) to the initial participant to be able to interview others by their own consent

3. Protection of participants' privacy and data confidentiality

Protection of the privacy of the participants will be ensured, their answers and names will be anonymous if they are not willing to make it public as well as their role in the area and the conservation area. Participants will be informed ahead of time about the interview as well as the consent form for them to be ready and comfortable during the interview. Participants will be only allowed to participate in this research if they want to, and they are also allowed to stop at any time they feel uncomfortable or when they feel like they do not want to answer some questions. The discussion will be recorded with the consent of the participants and will only be used for the purpose of the research. All audios will be recorded on a password protective device, and only the interviewer and advisor will have

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access to listening to the audio. At the end of the research, all identifiers will be deleted/shredded once data is collected and transcribed.

4. Research method/procedure

The two areas where the research will be conducted are Jabal Moussa biosphere reserve, and Ehden protected area. Stakeholder analysis will be conducted to be able to identify those who will be contacted to hold interview with. Stakeholder analysis is a technique used in management studies, it is commonly used for generating knowledge about actors whether individuals or organizations, their behaviors, interests and their stand in decision making. Stakeholder analysis also helps identify the current stand of actors in projects as well as plans for the project and the people contributing to the project. Thus the "Reputational Approach" will be used; this approach involves consulting knowledgeable individuals for their suggestions to enumerate the stakeholders. Once the stakeholders are selected, an in-depth interview will be conducted with them to be able to get detailed information about their knowledge of the studied area. The in-depth interview is qualitative research that uses a small number of respondents with a large amount of information gained. When the number of interviewees is smaller, more time will be provided to them to answer more comfortably and freely where details will matter and help with making the study more accurate. In depth interviews have several advantages as well as disadvantages, some of its advantages include: provision of more detailed information as well as relaxation and comfort to the person interviewing and being interviewed, these two are very important when it comes to data collection to be able to collect factual and accurate information.

The following characteristics will be used to identify the primary stakeholders which will in turn help name others to be included in the interviews:

- 1- knowledge levels about the biosphere reserves and protected areas that the study will take place in
- 2- knowledge about the people who live and work in the region
- 3- their interest from the biosphere reserves or protected area and the advantage and disadvantages observed by these stakeholders
- 4- their relation with other stakeholders
- 5- leadership: which is the amount of input they bring to the biosphere reserve and protected area

Analysis of how the land has changed over time throughout history will be conducted. Maps of the area will be collected to be able to compare how see how the land changed over time and what are the services that appeared or was added to later on when the protected area or biosphere reserve was forming, mapping will help the participants of the study, which are the stakeholders, to better understand and state the benefits and changes found in the reserve. Some additional information such as data on previous visits during the years (if available), the activities provided and the changes that have happened during the years in the reserve will be collected, these data will help give an idea on how changed during the years have attracted more people to visit the reserve and how people perception of the reserve has changed

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Due to the corona situation in the country, interviews will be conducted via skype/ whatsapp/ calls for the safety of the participants and the interviewer.

Question guide structure: BR (biosphere reserve) PA (protected area) {No names of people will be gathered from the following question}

HISTORY AND INITIATION

- How were the areas used before the initiation of the idea? Was it agricultural land? Was it an untouched forest?
- Who were the users of the area before the initiation of the idea? Was it a public land? Was it owned by someone?
- When did Jabal Moussa/ Ehden become a BR/ PA?
- Why was the idea initiated? Why did they want to turn the area into a reserve? What was their goal from making it into a reserve?
- Who initiated the idea? Was it a person? Religious sect who wanted to protect land? Was it proposed by an organization?
- Who was the owner of the lands?
- Who applied?
- How did they decide to make it a BR/ PA specifically? Why was it a BR and not a NR in case of Jabal moussa and vice versa.
- Who decided to apply? Was it a group or the ministry or politicians or locals?
- What is the application form and method?
- What is the application process? What were the steps taken?
- Who is the body that receives the application?
- Who is the body that reviews and accepts the application?
- What Area (which villages which zones size) Is Covered By this BR/ PA? (the researcher will bring an aerial map)

OPERATION

Management

- Who is in charge of funding? A person? NGO? locals?
- Who is in charge of visitors?
- Who is in charge of promotion?
- Who is in charge of protection?
- Who is in charge of managing?
- Who has access to the BR/ PA? Is it open for everyone?

Tourism

- What are the different activities found in the BR/ PA?
- What are the strengths of the BR/PA?
- What are the problems the BR/ PA faces and think they can work on it even more?
- How many visitors does the BR/ PA have yearly? Has the number of visitors increased or decreased over time? Why? Why not?
- What has encouraged change in the visitor numbers ever since the establishment of the BR/PA?

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- What are infrastructure changes/advances that have happened in the BR/ PA throughout the years?
- How have these changes had an impact on tourism?

Livelihood

- Does the BR/ PA provide some kind of livelihood for locals?
- Do locals participate in production of goods from services found in the BR/PA?
- What are some ways villagers are contributing to the reserve? Agriculture? Production of goods?
- Does the BR/ PA have locals working in the reserve?

Local perception (nearby villages)

- Do the locals like it? Are they supportive of having a BR/ NR in the region?
- Do the locals visit the BR/PA? If yes, how frequently do they do so?
- Who amongst the locals visit most? Elderly? Younger generation? Families? Etc. and why do you think so?
- Do the locals, in your opinion, support the BR/ PA?
- Do they participate in activities regarding the BR/ PA?

Goals of the reserve

- Why in your opinion was Jabal Moussa Designated as a BR or Ehden as an PA?
- Now that Jabal Moussa is a BR what is it protecting? (Same for Ehden PA)
- What is the reserve trying to protect (is it a valuable species, service etc.)
- Other than biodiversity, what are some valuable elements protected in the BR/ PA?
- What ecosystem services are found in the reserve?

Transition and buffer zone areas

Involvement of villagers

- Who are the main families in the village that most know of the start of the reserve?
- Were these families involved in the initiation of the BR/ PA?
- How has the reserve helped people of the village? Did it provide livelihood? Material services?
- What has the reserve provided for the people living in the area?
- How are the villagers part of the biosphere reserve? Are they involved in decision making? Do the organizers take into consideration what the people have to say?
- How are the villagers of the surrounding areas of the reserve different from villagers who don't have a BR/PA in their region?
- What are some ways the villagers contribute to the reserve?

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- Does the reserve promote education and research?
- Does the religious party of the Biosphere reserve contribute to the reserve?
- Has the religious sect of the region, in any way, benefitted from the reserve?

From these questions, several themes and categories will be established, to be able to ask more detailed questions to those who will be interviewed in the second part of which will be selected and recognized using the snowball technique

5. Data analysis and disposition of data collected (including any audio or video recordings) at the end of the study.

At the end of the study, the data collected will be listened to again and transcribed to be able to get different themes and ideas from, once that is done, the information will be written to submit my thesis to the committee. *All audios will be recorded on a password protective device, and only the interviewer and advisor will have access to listening to the audio. At the end of the research, all identifiers will be deleted/shredded once data is collected and transcribed.*

6. Preparation of report and intentions regarding dissemination of findings

The data collected and transcribed will be used for the thesis study and defense in the coming fall semester.

NOTE: The interview questions are set in a way to ensure participants don't feel discomfort throughout the process. Questions are prepared and identified to ensure information only about the biosphere reserve or protected area, and no information about the privacy or personal life of the interviewee is obtained.

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Oral Consent form for Stakeholders

Sample Oral Consent Script – SBS Student Project

Historical overview of Biosphere Reserves and Protected areas in Lebanon

Dr. Salma Talhouk

Rhea Ekmekji

Hello. My name is Rhea Ekmekji. I am a graduate student in the Department/School of Landscape and ecosystem management at AUB. I would like to invite you to participate in a **research study** about biosphere reserves and protected areas in Lebanon, to understand its historical overview and change over time to relate it to sustainability and importance of these areas.

Before we begin, I would like to take a few minutes to explain why I am inviting you to participate and what will be done with the information you provide. You will be asked to participate in an interview that will last around 30-40 minutes where questions regarding your knowledge about the conserved areas will be collected. Please stop me at any time if you have questions about the study such as: what year was the reserve created, who are the main families of the area, what are the main resources wanted to preserve etc.

I am doing this study as part of my studies at AUB. I will be interviewing around 5-6 people from each area to gather information about their knowledge of the reserves as well as the history of the area and how it led to the formation of a reserve, and will use the information as the basis for my thesis. I may also use this information in articles that might be published, as well as in academic presentations. Your individual privacy and **confidentiality of the information** you provide will be maintained in all published and written data analysis resulting from the study. Your position in the village will be stated if taken your approval to be able to show your relation with the reserve and its history. **Understanding your position in the village will give us an idea on how you contribute to the biosphere reserve or protected area and how you benefit to the reserve (bee keeper, manager, farmer, etc.)**

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The following research will be based on interviews conducted in Jabal Moussa and Ehden, where the participants will be selected based on their knowledge on the biosphere reserve and protected area. The interviews will be voice recorded by their consent to be able to gather the best information and the most accurate. Questions that will be asked are those only related to the areas and the history of the area. Due to the corona situation in the country, interviews will be conducted via skype/ whatsapp/ calls for the safety of the participants and the interviewer.

Participants will be selected using the reputational approach, followed by the snowball technique to be able to pick the knowledgeable people regarding the conservation areas.

In order to avoid perceptions of undue influence, contact information of potential subjects will be shared with the investigators, only if approval was sought by the seed participant to share this information. Participants' contact information will be written on a separate list and immediately shredded after the interviews are done.

Your participation should take approximately 40 minutes. Please understand your **participation is entirely on a voluntary basis** and you have the right to withdraw your consent or **discontinue participation at any time without penalty and your relation with the academic institution (AUB) will not be affected in any way**. The benefits which may reasonably be expected to result from this study are knowledge on the reserves as a whole for future intervention purposes **Your** participation in this study will contribute to academic research as well as understanding more of the biosphere reserve and protected area the study is being conducted on.

If at any time and for any reason, you would prefer not to answer any questions, please feel free to skip those questions [interview – say ‘skip this question’]. If at any time, you would like to stop participating,

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please tell me. We can take a break, stop and continue at a later date, or stop altogether. You will not be penalized for deciding to stop participation at any time

I would like to tape record this interview so as to make sure that I remember accurately all the information you provide. I will keep these tapes in my laptop only and they will only be used by me or my professor only if needed

NOTE: The interview questions are set in a way to ensure participants don't feel discomfort throughout the process. Questions are prepared and identified to ensure information only about the biosphere reserve or protected area, and no information about the privacy or personal life of the interviewee is obtained.

If you have any questions, you are free to ask them now. If you have questions later, you may contact me at my phone number: 71514987 or email: rfe18@mail.aub.edu. If you have questions about your rights as a participant in this research, you can contact the following office at AUB: [S IRB/IRB Office, American University of Beirut, 01374444 (ext. 5454), irb@aub.edu.lb.]

Are you interested in participating in this study?

Consent to Record Interview

May I record this interview?

Consent to Quote from Interview

I may wish to quote from this interview either in the presentations or articles resulting from this work.

Do you allow me to quote from this interview?

Consent to Use Name

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There may be reasons for which you prefer that your true name be used in presentations and articles related to this research.

Would you like your true name to be used in any oral presentations or written documents resulting from this research?

[Note that if a participant agrees to have his or her name used, signed consent should be obtained, including a separate signature line for participation, taping (where applicable), and use of name. In such cases, add signature lines to this consent document. Remember to always give a copy of the Consent Form to the participant.

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APPENDIX B

Arabic version of consent form

Arabic Consent form IRB

Historical overview of Biosphere Reserves and Protected areas in Lebanon/

لمحة تاريخية عن محميات المحيط الحيوي والمناطق المحمية في لبنان

د. سلمى تالهورك

ريا اكمكجي

مرحباً. اسمي ريا اكمكجي. أنا طالب دراسات عليا في قسم / كلية المناظر الطبيعية وإدارة النظام البيئي في الجامعة الأميركية في بيروت. أود أن أدعوك للمشاركة في دراسة بحثية حول محميات المحيط الحيوي والمناطق المحمية في لبنان، لفهم نظراته التاريخية والتغيير بمرور الوقت لربطه بالاستدامة وأهمية هذه المناطق.

قبل أن نبدأ، أود أن أستغرق بضع دقائق لشرح سبب دعوتك للمشاركة وما سيتم عمله بالمعلومات التي تقدمها. سيطلب منك المشاركة في مقابلة تستمر حوالي 30-40 دقيقة حيث يتم جمع الأسئلة المتعلقة بمعرفتك بالمناطق المحفوظة. من فضلك أوقفني في أي وقت إذا كانت لديك أسئلة حول الدراسة مثل: ما هو العام الذي تم فيه إنشاء الاحتياطي، ومن هم العائلات الرئيسية في المنطقة، وما هي الموارد الرئيسية التي تريد الحفاظ عليها وما إلى ذلك.

أقوم بهذه الدراسة كجزء من دراستي في الجامعة الأميركية في بيروت. سأجري مقابلات مع حوالي 5-6 أشخاص من كل منطقة لجمع معلومات حول معرفتهم بالاحتياطيات وكذلك تاريخ المنطقة وكيف أدى ذلك إلى تكوين احتياطي، وسأستخدم المعلومات كأساس لبلدي أطروحة. يمكنني أيضاً استخدام هذه المعلومات في المقالات التي قد يتم نشرها، وكذلك في العروض الأكاديمية. سيتم الحفاظ على خصوصيتك وسرية المعلومات التي تقدمها في كل تحليل للبيانات المنشورة والمكتوبة الناتجة عن الدراسة. سيتم ذكر موقعك في القرية إذا تم أخذ موافقتك لتتمكن من إظهار علاقتك مع المحمية وتاريخها. إن فهم موقعك في القرية سيعطينا فكرة عن كيفية مساهمتك في محمية المحيط الحيوي أو المنطقة المحمية وكيف تستفيد من المحمية (مربي النحل، المدير، المزارع، إلخ).

سوف يستند البحث التالي إلى مقابلات أجريت في جبل موسى وإهدن، حيث سيتم اختيار المشاركين بناءً على معرفتهم في محمية المحيط الحيوي والمنطقة المحمية. سيتم تسجيل المقابلات بالصوت بموافقتهم لتكون قادرة على جمع أفضل المعلومات وأكثرها دقة. الأسئلة التي سيتم طرحها هي تلك المتعلقة فقط بالمناطق وتاريخ

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المنطقة. بسبب وضع الكورونا في البلد ، سيتم إجراء المقابلات عبر سكايب / واتساب / مكالمات من أجل سلامة المشاركين والمحاور

سيتم اختيار المشاركين باستخدام نهج السمعة، تليها تقنية كرة الثلج لتكون قادرة على اختيار الأشخاص المطلعين فيما يتعلق بمناطق الحفظ.

من أجل تجنب تصورات التأثير غير المبرر، سيتم مشاركة معلومات الاتصال الخاصة بالموضوعات المحتملة مع المحققين، فقط إذا تم طلب الموافقة من قبل المشارك الأساسي لمشاركة هذه المعلومات. سيتم كتابة معلومات الاتصال الخاصة بالمشاركين على قائمة منفصلة وتمزيقها فورًا بعد إجراء المقابلات. يجب أن تستغرق مشاركتك حوالي 40 دقيقة. يرجى فهم مشاركتك بالكامل على أساس طوعي ولديك الحق في سحب موافقتك أو إيقاف المشاركة في أي وقت دون عقوبة ولن تتأثر علاقتك بالمؤسسة الأكاديمية (AUB) jw,dv بأي شكل من الأشكال. الفوائد التي يمكن توقعها بشكل معقول من هذه الدراسة هي معرفة الاحتياطات ككل لأغراض التدخل في المستقبل. ستساهم مشاركتك في هذه الدراسة في البحث الأكاديمي وكذلك فهم المزيد من محميات المحيط الحيوي والمنطقة المحمية التي تجري الدراسة عليها.

إذا كنت تفضل في أي وقت ولأي سبب عدم الإجابة عن أي أسئلة، فلا تتردد في تخطي هذه الأسئلة [مقابلة - قل "تخطي هذا السؤال"]. إذا أردت التوقف عن المشاركة في أي وقت، فيرجى إبلاغي بذلك. يمكننا أن نأخذ استراحة أو نتوقف ونستمر في وقت متأخر أو نتوقف كليًا. لن تتم معاقبتك على قرار إيقاف المشاركة في أي وقت

أود تسجيل شريط تسجيل لهذه المقابلة للتأكد من أنني أتذكر بدقة جميع المعلومات التي تقدمها. سأحتفظ بهذه الأشرطة في جهاز الكمبيوتر المحمول الخاص بي فقط ولن أستخدمها أنا أو أستاذي إلا عند الحاجة

إذا كنت تفضل في أي وقت ولأي سبب عدم الإجابة عن أي أسئلة، فلا تتردد في تخطي هذه الأسئلة [مقابلة - قل "تخطي هذا السؤال"]. إذا أردت التوقف عن المشاركة في أي وقت، فيرجى إبلاغي بذلك. يمكننا أن نأخذ استراحة أو نتوقف ونستمر في وقت متأخر أو نتوقف كليًا. لن تتم معاقبتك على قرار إيقاف المشاركة في أي وقت

أود تسجيل شريط تسجيل / فيديو لهذه المقابلة للتأكد من أنني أتذكر بدقة جميع المعلومات التي تقدمها. سأحتفظ بهذه الأشرطة في جهاز الكمبيوتر المحمول الخاص بي فقط ولن أستخدمها أنا أو أستاذي إلا

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عند الحاجة

ملاحظة: يتم تعيين أسئلة المقابلة بطريقة تضمن عدم شعور المشاركين بعدم الراحة طوال العملية. يتم إعداد الأسئلة وتحديدها لضمان المعلومات فقط حول محمية المحيط الحيوي أو المنطقة المحمية، ولا يتم الحصول على أي معلومات حول الخصوصية أو الحياة الشخصية للمقابل.

إذا كان لديك أي أسئلة، فأنت حر في طرحها الآن. إذا كانت لديك أسئلة لاحقاً، فيمكنك الاتصال بي على رقم هاتفي: 71514987 أو البريد الإلكتروني: rfe18@mail.aub.edu. إذا كانت لديك أسئلة حول حقوقك كمشارك في هذا البحث، فيمكنك الاتصال بالمكتب التالي على AUB: [S IRB / IRB Office، irb@aub.edu.lb.]، (ext. 5454) 01374444، American University of Beirut

لموافقة على تسجيل المقابلة

هل يمكنني تسجيل هذه المقابلة؟

الموافقة على الاقتباس من المقابلة

قد أقتبس من هذه المقابلة إما في العروض التقديمية أو المقالات الناتجة عن هذا العمل.

هل تسمح لي بالاقتباس من هذه المقابلة؟

الموافقة على استخدام الاسم

قد تكون هناك أسباب تفضل استخدام اسمك الحقيقي في العروض التقديمية والمقالات المتعلقة بهذا البحث. هل ترغب في استخدام اسمك الحقيقي في أي عروض تقديمية شفوية أو وثائق مكتوبة ناتجة عن هذا البحث؟ [لاحظ أنه إذا وافق أحد المشاركين على استخدام اسمه، فيجب الحصول على الموافقة الموقعة، بما في ذلك سطر توقيع منفصل للمشاركة، والتسجيل (حيثما ينطبق ذلك)، واستخدام الاسم. في مثل هذه الحالات، أضف سطور التوقيع إلى مستند الموافقة هذا. تذكر دائماً إعطاء نسخة من نموذج الموافقة للمشاركة.

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APPENDIX C



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APPROVAL OF RESEARCH

June 17, 2020

Salma Talhouk, PhD
American University of Beirut
01-350000 ext.: 4508
ntsalma@aub.edu.lb

Dear Dr. Talhouk,

On June 17, 2020, the IRB reviewed the following protocol:

Type of Review:	Initial, Exempt
Project Title:	Historical overview of biosphere reserves and protected areas in Lebanon
Investigator:	Salma Talhouk
IRB ID:	SBS-2020-0158
Funding Agency:	None
Documents reviewed:	Received June 3, 2020: <ul style="list-style-type: none">• Proposal• Oral Consent (English and Arabic versions)• Questionnaire (English and Arabic versions)• IRB online participation form (English and Arabic versions) Received March 26, 2020: <ul style="list-style-type: none">• IRB Application

The IRB approved the protocol from June 17, 2020, to June 16, 2021, inclusive.

Please find attached the stamped approved documents:

- Proposal (Received June 3, 2020)
- Oral Consent (English and Arabic versions) (Received June 3, 2020)
- Questionnaire (English and Arabic versions) (Received June 3, 2020)
- IRB online participation form (English and Arabic versions) (Received June 3, 2020)

Only these IRB approved documents can be used for this research study.

Thank you.

The American University of Beirut and its Institutional Review Board, under the Institution's Federal Wide Assurance with OHRP, comply with the Department of Health and Human Services (DHHS) Code of Federal Regulations for the Protection of Human Subjects ("The Common Rule") 45CFR46, subparts A, B, C, and D, with 21CFR56; and operate in a manner consistent with the Belmont Report, FDA guidance, Good Clinical Practices under the ICH guidelines, and applicable national/local regulations.

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Beirut PO Box 11-0236 (F15), Riad El Solh 1107 2020, Beirut, Lebanon | Tel: +961 1 350000 Ext: 5445 | Fax: +961 1 738025 | Email: irb@aub.edu.lb
New York 3 Dag Hammarskjöld Plaza, 8th floor | New York, NY 10017-2303, USA | Tel: +1-212-583-7600 | Fax: +1-212-583-7651



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Sincerely,

Lina El-Onsi Daouk, MSc, CIM
IRB administrator, Social and Behavioral Sciences

Cc: Michael Clinton, PhD
Co-Chairperson IRB Social & Behavioral Sciences

Fuad Ziyadeh, MD, FACP, FRCP
Professor of Medicine and Biochemistry
Chairperson of the IRB

Ali K. Abu-Alfa, MD, FASN, FAHA
Professor of Medicine
Director, Human Research Protection Program
Director for Research Affairs (AUBMC)

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APPENDIX D

I. Individual Interviews

Horsh Ehden

Meaning Units	Meaning Units' Condensation	Code
They were established by local NGOs to protect nature and cultural heritage of Lebanon and was not based on the IUCN	Established by a local NGO for nature protection	establishment
: they established nature reserves to stop violation of natural resources such as grazing, cutting trees etc. the NGO who started the initiative always had a concern and wanted to stop exploitation	Stop violation of natural resources	goal
In 1996, a project was established funded by GEF (global environmental Facility) where they invested in 3 protected areas: Horsh Ehden, Shouf and Palm island	Project established by GEF	establishment
The project was financed through GEF. Backstopped by IUCN and UNDP was the implementing agency	3 main supporters: GEF, IUCN, UNDP	establishment
: the goal of the project was to conserve endangered endemic species, wildlife, strengthen capacity of MOE and NGOs and make national reconciliation, we wanted to represent the different ecosystems in Lebanon and based on that we established the regulations for reserves in Lebanon	Conserve endangered species and wildlife with help from MOE and NGO	goal
Horsh Ehden management has its own NGO, it is managed by a Local and is based on the MOE guidelines. MOE had a committee established for the management (representative of the ministry, representative of the organization and of the IUCN)	First managed by Locals and MOE guidelines	establishment

the reserve doesn't belong to anyone, it is only referred to the ministry of environment, some politicians are from the village but doesn't mean that they own the reserve or have a stand in it. They sometimes help make work easier, or get things done faster, but by regulation it belongs to the ministry because it's a public land.	Land is public and belongs to MOE	Ownership
MOE had a committee established for the management (representative of the ministry, representative of the organization and of the IUCN)	Special committee established for the reserve	management
There was lack of cooperation with stakeholders	Lack of cooperation	management
After the funding ended. The MOE helped fund the protected areas but with the management. They helped get fund from other ways such as ecotourism	After IUCN, main funding was from MOE and personal income	management
IUCN backstopping set criteria for establishment, red list of endangered species, provide experts	IUCN helped set criteria to establish the reserve	Establishment
The MOE aims at looking at the different ecosystems which is why they set the regulations to make them in to nature reserves	MOE set regulations for different ecosystems	regulations
They checked at the IUCN classifications and based the PA in Lebanon on them	Based on IUCN classification for Lebanon	regulations
When the reserve was first established in 1992, they created an NGO for the protected area to support it	NGO established for Horsh Ehdén	Establishment
they did a reserve by only closing the borders to not allow people in, today their concept and goal is different	Closed all borders and did not let anyone in	Pre-establishment
In 96-97 when the project with IUCN was established, they first set a management team (rangers, guides, assistants, managers...)	Management team was established when they first started working with IUCN	management
When the management plan was set, the concept of the nature reserve changed this is where ecotourism and awareness emerged	Concept of the reserve changed with time but still maintaining the main goal	goal

When IUCN stopped working with the team, Nature reserves then continued to work with the team designated by MOE which help supervise	Horsh Ehdén and MOE worked independently of IUCN later on	management
The MOE gives a partial fund (annual budget) to the reserve and the rest they make provide for their own, but the MOE hasn't given them money since 2015 and the budget isn't retroactive meaning that they won't get it anymore	MOE supposedly provides annual funding for Horsh Ehdén, but it doesn't pay them as needed	Limitation
They depend on entrance fees, donations, projects with international NGOs	Income depends on different ways	projects
Tourism: in 96-97 when the project started, they needed time in order to prepare the area and build it in a way for it to be visitor friendly	The area was not a tourist friendly area at first	tourism
People didn't know about the project of the reserve and what its main aim was	Project was not known about	perspective
Today, there are entrances and they became better by the year by introducing new ways to track the tourism and evolution	Enhancement since the establishment	establishment
Even during days with covid, tourism in Ehdén didn't have a major decrease, people still visited and wanted to go to Horsh Ehdén	There are no barriers to the reserve today	establishment
Strength of Horsh Ehdén are the flora and fauna of the region and its biodiversity	Rich in biodiversity	preservation
Main activities: hiking, bird watching, snow shoeing, photography, star gazing and night walks. Outside the reserve: reforestation activities, zip lining etc.	Consists of many activities within the reserve	activities
Those who come to Ehdén, come as visitors, it's an attractive point in qada2 Zgharta. Those who come will have an economic impact ex. Breakfast, gas stations, stays, shops etc.	Visitors have an impact on the locals when they visit	tourism
Even the staff of the reserve are locals, infrastructure or when they want to buy or do projects they make sure the providers are from the locals even the projects partners and workers are locals	Reserve encourages locals with everything they do to enhance involvement of the locals	management
In 1992, when they first did the reserve, people didn't want the reserve. Because	People did not want the reserve at first	perspective

they believed that they took a public land from them which they used for grazing, picnic, hunting etc. so they thought they took this freedom from them		
But now when they saw how its evolved and everyone is talking about it, on social media and tourists from different countries, it's not a pride for them to be from this community	People look at the reserve in a different way today	perspective
The staff started very small 1-2 rangers, but if the people didn't know that there is this respect for the rules they wouldn't encourage it	Management team started very small at first	management
Many come daily to walk and see, even if they don't support in a specific way, they still don't harm it so no negative impact All ages come to visit, even seasonal spring and fall school kids visit, clubs, companies etc.	Locals visit the reserve more than before The reserve is not age specific	Perspective
The main goal hasn't change which is protection and preservation (conservation) but the way of protection has changed	Goal of reserve is still the same with changes	goal
Financial sustainability is important and ecotourism helped with the income	Ecotourism has had a major impact	tourism
The system is wrong, and as a Lebanese government or MOE they are not doing what is needed to provide for it, they had let each reserve do what they want to provide for themselves	The MOE doesn't support as much as they should	limitation
No researchers in Ehden, they come from outside but the reserve helps with what they need because they need a budget and project and monitoring	There is not as much research as should be	limitation
Education comes in two ways, school visits to the reserve and to the schools as well by providing power point presentations not just about the reserve but about the environment and environmental topics as well as awareness. Sometimes certain groups or schools can't visit I they don't have the means so they go to them	Education about the environment and reserve is provided in different ways	education

During exhibitions, they get stands to grasp people's attention which is awareness and education	Participate in educational activities	Education
The village is a Christian area, the church doesn't have a say but many (Batrak) priests used to punish people who cut trees or intend on harming it	Church is not involved with the reserve	Pre-establishment
These people worked on preserving the land before it was a reserve which is why they still have all this nature and greenery today.	The priests helped preserve the land today	Pre-establishment
There is a management plan for the reserve which focuses on vision and objective and they work on ecotourism, reforestation projects, scientific research, awareness and education	A specific management plan is set for the reserve which focuses on vision and objective	management
Projects with donors include reforestation projects, planting more than 150,000 trees. Trail maintenance for tourists and fire emergencies The reserve lake done for emergencies as well as used for watering the plants Seed banking or seed germination to plant in their designated spots Project with UNDP about the insects in the reserve Project with USJ with CEPF critical ecosystem fund working on 5 endemic species found	Many projects with international donors	projects
40% of the flora and fauna of Lebanon is found in Horsh Ehden, and has a lot of biological variety	Rich in flora and fauna	Preservation
back in the day it was mainly used for picnics and grazing no agriculture.	It was mainly used for grazing	Pre-establishment
Everything in the reserve has already been there nothing additional is planted and they do seed banking	No new plant species are added in the reserve	regulations
today, Horsh Ehden has its own rules and regulations. If anyone breaks the rules they get fined	Specific rules set for Horsh Ehden	regulations
when they decided to make a nature reserve, they set a team and presented it to the municipality and parliament	Specific team set for the establishment of the reserve	establishment
NGOs still support the reserve such as WFP who support and participate in projects with the nature reserve	International support and funding is provided to the reserve	projects

Activities include hiking and snow shoeing but there also are some activities outside the reserve like atv, buggy etc.	The reserve has many activities	activities
The reserve keeps on getting better by the year, in terms of management, tourism, plans, road strategy, even people respect the rules much better than they did before	Perspective of the reserve has evolved with time	perspective
People who live around are positively affected by the reserve, some sell goods in the shop, others indirectly benefit such as from the stay, restaurants etc.	Locals benefit from the reserve	perspective
Foreigners get encouraged to come visit because of the ratings and images and the scientific facts about the reserve Many visitors are foreigners from countries such as Russia, Switzerland etc	People come to visit from all around the world	tourism
Horsh Ehdén stakeholder was the first to Draft a regulation of the reserve which was approved by the MOE and was then used for the reserves established later on	Established a regulation for nature reserves	regulation
The team is composed of locals. the NGO manager is usually the head of the municipality (Mayor) because that way the municipality of Ehdén will be aware of what's going on in the reserve as well as be able to help the reserve when needed	Team is composed of different people who are all locals	management
Throughout the years, as the mayor of the region changed, the team faced several complications with the management of the reserve	Complications and limitations in management	limitation
today, the municipality is almost totally absent even though the leader is the old mayor they have more potential but no action is done	Municipality is not involved as much as it should be	limitation
the municipality does get updates about the reserve but they don't help	Almost no involvement from the municipality	limitation
there is a lack of mapping, ex. The borders of the reserve aren't clear. Different people have different views of the borders which create problems with the people, because the more you expand	Lack of clear data about the reserve	limitation

the more you have to mitigate and manage		
Part of the management team is set by the ministry of environment at the establishment of the reserve	MOE involvement in management	Establishment
At first, there wasn't a law that it will be a reserve. It was set by a decision that they wanted to make it a reserve	No specific law for nature reserves at first	regulation
A group of young activists wanted to turn the area into a reserve A local had a talk in AUB about the area, and two students from Ehden decided to talk to him because they were passionate about the area	Young activists pushed in to turning the region in to a reserve	Pre-establishment
Different people from different backgrounds came together to start a reserve in Ehden.	Different people from different backgrounds came together	Pre-establishment
Ricardo had his own NGO and said that the reserve should have his own for the management and it should be made up of locals	Ricardo pushed in to establishing an NGO	Pre-establishment
A local (active stakeholder) took advantage of his position in media and raised awareness about the reserve on TV programs on LBC and radio and helped people realize there is a reserve such as Horsh Ehden	Worked on raising awareness	education
They also took the Shepherd's and told them that since you can't graze in this land anymore, we will help you in other ways for work and income by making you part of the reserve	They worked on convincing shepherds to not graze in the land	Pre-establishment
They worked on awareness mainly for the people of the region to help them understand why it's important to have this reserve	Worked on raising awareness among the people	education
They stopped planting in the reserve, no plants are allowed to be planted from outside only seed banking from plants found in the reserve	Forbid planting in the reserve	regulation
The NGO was then turned in to a management team	NGO was turned in to the current management team	management

2 from Zgharta municipality, 2 Eco tourists, 2 from the NGO and people from the reserve as representatives		
now, everyone loves and wants to be part of the reserve, before they didn't have everyone's consent and the management team got stronger by the year	People love and encourage the reserve today	perspective
reserve is based on regulation #121, which was set by the parliament which talks about everything that's forbidden inside the reserve but they added some things that are allowed inside as well	Reserve is formed around regulation #121	regulation
the people want to cope with are also political parties anything they want to do or get approval off won't happen if the political members from the region don't approve it so, they have the support of the politicians which helps them in projects and decisions but the politicians don't have a say in decision making regarding the reserve	Political parties have some involvement with the reserve but only in a way to help it and not taking decision	management
their goal isn't to be the biggest nature reserve in Lebanon or the region but to have a reserve with the best quality and flora and fauna as well as biological diversity. Quality over quantity	The aim is to have proper conservation	goal

Jabal Moussa

Meaning Units	Meaning Units' Condensation	Code
Both horsh Ehdén and JM are protected areas but their designation on local level are different, JM is mostly private land, and is consisted of different land ownership	JM is a privately protected area	ownership
JM is also based on a private NGO. It is called a privately protected area, and is not funded by the government, APJM which is the private NGO funds it and takes care of all the expenses and everything relate to the reserve	JM has its own NGO	establishment
Although JM is a privately protected area Some parts or villages of the	Some land of JM is public	ownership

reserve is protected by the MOE, because they call it a natural spot		
the concept for the protection of jabal Moussa was first established during the 2006 war in Lebanon. It started from the people of Qamhaz, mostly a group of school friends including and then others from the different villages joined in. during the 2006 war, people started hearing strong noises coming from the area and automatically thought that the land is being attacked and that's why they found out that it was being illegally quarried, After that incident, Pierre who is one of the founders thought that he had to do something to protect the land. The APJM NGO was later on established in 2007 to protect the mountain.	Established after the 2006 war	establishment
The main aim was to stop people from illegally quarrying which is why they established the NGO and that's how the idea of privately protecting the land was first established.	First established to prevent people from quarrying	goal
The idea started with renting the land from the church to protect it and then established the NGO, they later on rented more privately owned land to protect it. Ownership hasn't changed today, but the NGO still rents the land to protect it	They rented the land to protect it	ownership
They still face violation issued however much more manageable than before (there still is violation, burning etc.)	They still face violation	perspective
There is a land in collaboration with the MOE that's being protected, the MOE does not have any interference with it however they do still get reports and updates about the reserve	Reserve is private with some monitoring from the MOE	ownership
this land opened doors for research and people conducting studies and social status of the area.	People conduct research in the area	education
they understood the worth of the area and dedicated more to the protection and made a nomination file to submit	They turned to UNESCO and MAB to	establishment

to UNESCO for the MAB, they wanted to turn this land in to an international and legally recognized reserve thus based it on the UNESCO guidelines, and working in collaboration with the MAB helped involve the locals in the project	internationalize the reserve	
placing the reserve under the MAB changed the concept of the protection and is what made them include the people around it as part of the reserve, including the people is part of their everyday lives and part of the MAB project from UNESCO.	Being part of the MAB helped them include the locals as part of the reserve	goal
we are still considered as a new NGO and are still working on gaining the trust and support of the people. people still don't support it 100%, some still think they lost rights when they couldn't go in to the public land however gaining the peoples trust and support has changed a lot with time.	Not everyone completely supports the reserve today	perspective
the people working in the reserve are trying to work with the people and punish those who violate at the same time so it's hard for them.	Work on including the locals as much as possible	goal
Unfortunately, due to the economic situation of the country, people expect them to be easier on them and more helpful with job opportunities but it's not something they can do so, being a small NGO so it's affecting their relationship with the people and we do our best to cooperate with the people for work related to the reserve, like grazing, harvesting etc	The people expect a lot from the NGO regarding job opportunities to accept the reserve	perspective
unfortunately, no matter how supportive the people are, if they don't have an interest they won't be as helpful as needed and many people have misconceptions about the reserve and others are stubborn when it comes to involvement and support but thankfully there has been a lot of progress in these past 10 years	Many people still don't support the reserve because they have no interest from it	perspective

Many people see the reserve as a safe spot, because of how its managed and organized.	People feel safe in the reserve	perspective
We try our best to support the people by encouraging guest houses, helping them sell products, hiring them for work in the reserve and many rely on this income	Encourage locals in different jobs in the reserve	perspective
Lebanon lacks basic data for research which affects the studies conducted in the research and I believe that this is a limitation for the reserve	Lack of research in the reserve	education
we raise awareness by participating in worldwide campaigns and conferences as well as school visits to gain the interest of the younger generation.	Take part in different educational activities	education
Many people see the reserve as a safe spot, because of how its managed and organized Activities include: research, hiking, picnics	Have different activities in the reserve	tourism
The Idea of protection in the region started when a group of people saw the need of protection of land from invaders	Protection from invaders	Pre-establishment
Part of the land belonged to the government and the other part was private belonging to 3 different groups: Ghbale municipality, Yahchouch Municipality and the Maronite church.	Lands of reserve were either private land or municipality owned	ownership
A Local initiated the idea and made a group of people from the area who all share a common interest which is the protection of the land to make the biosphere. the concept was initiated after the 2006 war, when they saw that the land was ignored and people were using it for the wrong reason	Established after the 2006 war	Pre-establishment
initiating the biosphere reserve was good for the municipality as well, because turning this land into a protected area meant that they wouldn't worry about destruction	Establishment of the reserve protected the land from corruption	establishment
the reserve supports the people directly and indirectly. people opened restaurants which helped provide income when visitors come to the area to see the reserve, they supported	The reserve supports the locals	management

<p>guesthouses, and started selling preserves locally made by the villagers. They also hired people to work in the reserve as guards, guides etc. most of the people around the reserve support it and are happy with its presence</p>		
<p>compared to before the reserve is much better and more organized than how it used to be, they have expanded and added trails, have emergency plans especially for forest fires and this has encouraged the people to support it even more.</p>	<p>The reserve has improved a lot with time</p>	<p>management</p>
<p>The reserve is much more famous than what it used to be and it has gained fame throughout the years especially these past 2 years with the pandemic because people seek nature and open air rather than going to crowded places</p>	<p>People have gained interest in the reserve much more with time</p>	<p>tourism</p>
<p>Jabal Moussa is different than other reserves because there are people who genuinely care for it and work for its protection</p>	<p>The management team work with a lot of care for the reserve</p>	<p>management</p>
<p>One specialty is that the reserves aim is protecting both the people and land together, it gave the people a safe place and an open space. Today, when a problem rises like forest fire, the people worry and willingly go to help and fix the problem other than the staff of the reserve.</p>	<p>Locals are highly involved with the reserve</p>	<p>management</p>
<p>People's perception of the reserve has highly changed throughout the years, people at first didn't support because they thought public land which was their right was taken from them but now they understand why they did that and support it.</p>	<p>The people's perception has changed a lot with time</p>	<p>perspective</p>
<p>it opened doors for education, they let people go in and conduct research which is not seen in many places around the region</p>	<p>It was a source for education and research</p>	<p>education</p>
<p>they used to use part of the land for grazing, and our ancestors used to use the land for agriculture, they use to plant berries and grown cocoons and work with silk during the ottoman</p>	<p>Land was used for grazing and agriculture</p>	<p>Pre-establishment</p>

empire they used to plant wheat as well sustainably.		
the land was open for the people, part of the land was for the church	Land was privately owned by the church	ownership
the activities of silk making, agriculture etc. decreased a lot with time and the one thing people were doing is grazing in the land because life had evolved a lot and working in the land wasn't interesting for them anymore. A lot of people moved from the mountains to the city throughout the years and those who stayed started illegally quarrying in the land	The people started harming the land with time	Pre-establishment
in 2006 during the war people from around the village heard explosion noises and got scared, turned out it were people using explosions to break the mountains to open roads and looking at the history of the village that's when they realized that they needed to protect the land	After the 2006 war, they realized they had to protect the land	establishment
they submitted a proposal, since $\frac{3}{4}$ of the land belonged to the Maronite church they took the proposal on an international level which was the UNESCO biosphere reserve program	They decided to take the reserve on an international level	establishment
Of course, not all the land was designated as a biosphere reserve at the same time, starting from 2009 the reserve got bigger but they started with the land privately owned by the church.	The reserve grew with time	establishment
the designation was taken on a national scale but based on the UNESCO guidelines and regulations.	Reserve was based on the UNESCO guidelines	establishment
the program is called man and biosphere reserve. The mission and vision is to protect the land with the people, so we based our team all on locals its forbidden to do otherwise anyway. You have to include the locals in the team to connect the people with the nature and live in harmony to create sustainability	Hired and included locals in the team of the reserve	management
At first, they established board members from different backgrounds but what brought them together was their origin which is from the village.	Established members from different backgrounds but all from the region	management

<p>The president is Pierre Doumet who initiated the idea in the first place. The team is consisted of around 13 people who work full time from guards to ecotourism, conservation etc.</p>		
<p>as eco-tourism, the main activity is hiking, there are 15 trails ranging from easy to medium to hard. We first started with 3 trails and throughout the years evolved to 15, on the 10-year anniversary we did the full loop trail which was 19.6km. we also let people come plant in the reserve, visit the nursery, volunteering, people can buy trees and buy local products, bee keeping,. We are also establishing a center which will be a museum for the eco-tourism in Qemhez. We also have guesthouses, planting, videos to show visitors how our locals contribute to the reserve. We sell our products in the airport, shops, e-shops etc.</p>	<p>Different activities as ecotourism</p>	<p>tourism</p>
<p>we sell local made honey, thyme and other products made from the people who live in the region</p>	<p>Support local products</p>	<p>management</p>
<p>as a reserve, the nature is very beautiful and fragile. The endemic species are very sensitive and special in the reserve which is a key strength for the reserve, people come from all around to learn about them. When there's a big quantity, its success can cause problems which is a weakness because it needs further and even more professional care which if not provided can cause harm</p>	<p>Need to work more on the management and control of the reserve</p>	<p>limitation</p>
<p>Awareness is needed, there is a lot but there should be more</p>	<p>Needs more awareness</p>	<p>limitation</p>
<p>As for the local community, we face some challenges because not everyone understands us as a reserve nor the vision and mission of the reserve. People who have been benefitting from it all their lives won't accept it. They won't see a random staircase in the reserve as a historical monument from the roman age but will see it as a barrier along their way for passage which is</p>	<p>Still face challenges with the locals, not everyone accepts it</p>	<p>perspective</p>

<p>why they will want to break it and that's what the reserve is working on, to not let them ruin the land and its history. Some people don't care of the value and think they want to work and make money</p>		
<p>This is a very big challenge for us, but we still work on interacting with the locals to update them and tell them what's going on as well as create job opportunities for them to be able to change their perspective of the reserve and be more supportive</p>	<p>Try to involve the locals as much as possible</p>	<p>management</p>
<p>The young people are the ambassadors, they are guides from the villages who will help a lot in creating a bond between the people and the reserve. We will be doing more trainings and hiring more young people from the locals to create a stronger bond.</p>	<p>The younger generation are the future of the reserve</p>	<p>perspective</p>
<p>involving the people was from the start because it's the mission and vision for the APJM as well as MAB. They knew that the protection wouldn't be successful if the people weren't involved especially that it is a very big area consisting of 7 villages. So, involving the people and ensuring their protection will help the people and municipalities be more accepting</p>	<p>Involving locals was in the plan from the very start</p>	<p>goal</p>
<p>There still are many historical archives we don't know about; every time we visit the reserve we discover new archives we haven't seen before so the reserve holds much more than what we know which is why it's very important to protect it.</p>	<p>There still are many elements to be discovered</p>	<p>Archives</p>
<p>projects that are currently active and still are going on include: conservation of endemic species through community involvement through the funding of CEPF, EduBiomed-Capacity Building for Education and Applied Research in Mediterranean UNESCO's Biosphere reserve with the funding of the EU, Cultural routes for sustainable social and economic development in Mediterranean with</p>	<p>Different current and ongoing projects in the reserve</p>	<p>projects</p>

<p>the funding of the EU under the ENI CBC MED Programme and Hinterland Archeological Heritage in Jabal Moussa UNESCO Biosphere reserve with the funding of U.S. Ambassadors fund for cultural preservation (AFCP)</p>		
<p>based on regulation 7494 in the Lebanese parliament, as well as decisions number 13 and 3 from the ministry of culture and decision number 299/1 from the ministry of agriculture, different privately owned land was officially recognized as part of the Jabal Moussa biosphere reserve and all the land which is part of the biosphere reserve is mapped and placed by the different ministries which are all together recognized by the ministry of environment. And later on, this plan was presented to UNECO to be internationally placed on the map under the MAB program.</p>	<p>The biosphere reserve is based on different rules and regulations</p>	<p>regulations</p>
<p>in 2006, there were explosions heard in the village of Qamhaz and people started talking that the Israeli army were attacking the villages, but it turned out that someone had taken permission from the Maronite church saying that he wanted to “fix” the land to make it agricultural land but what he did was he broke a 20,000m mountain as it was which was the cause of the sound of the explosion the people heard</p>	<p>Established after sound of explosion during the 2006 war</p>	<p>establishment</p>
<p>During that time, I was an environmental activist in another area so I tried to stop him, until someone told me about a local saying that he as well is trying to stop that person from breaking the mountain in that region. I went and met with him and we decided to stop the man from what he was doing, we started calling powerful people from around the village from kesserwan, eventually we stopped him and Pierre had payed money to be able to stop the person.</p>	<p>Worked on stopping the violation by contacting people with power</p>	<p>establishment</p>

After the plan was successful we decided to continue this project and protect the land not just against a few people but by designating it as a biosphere reserve.	Decided to name it a biosphere reserve to legally protect it	goal
Different people from the village came together including several locals, and others and we worked on establishing an NGO. The NGO was made up of 5 people which was the APJM	Established an NGO for the reserve	establishment
We decided to include all 7 villages basically those who have quarrying in them, we called the different municipalities, called Ghbale municipality and rented land from them, Yahchouch municipality, we also contacted the one of the families who have a big land within the area of the reserve and we also contacted the Maronite church who have a very big land in the region and rented from them	Contacted municipalities and land owners from the 7 villages of the reserve	establishment
We faced many problems with the locals of the region, we used to walk in the villages below the mountain, because when we named the region as a biosphere reserve, this word is not accepted by the people, it's like someone has held a weapon on them not letting them benefit from public land and from making their own money, the people didn't like the concept of the biosphere reserve. The people became completely against it when they found out we would not be allowing them to cut wood from the forest because they depended on that business, we also stopped random grazing and hunting in the reserve and of course we would be forbidding quarrying. So, the people were completely against this reserve because we were a barrier to their income. The people were so furious at first that they tried to harm us in different ways such as burning out stands and entrances, the first part 5-6 years were very hard	Faced many issues regarding the people and acceptance of the reserve	perspective
but then we started to think that we needed to approach the people and	Studies were conducted to know and learn how to	education

include them in the reserve, we approached the university of St. Joseph where they conducted a study in the village about the locals of the villages surrounding, what the people work, what are their hobbies etc. and we had a big book about different jobs the people can work in the biosphere reserve.	include the people as part of the reserve	
The people had a lot of potential to work with the reserve, we established a kitchen with the help of USAID and the Swiss embassy to help the women work and sell their products, we also contacted locals who are unemployed students and hired them as guides in the reserve, we shaped and planned different paths for the reserve. We communicated with locals as well to establish guesthouse and help them make profit out of it	Created job opportunities for the locals	management
We then made the reserve bigger with time and had international contacts as well as participate in conferences internationally. We expanded the reserve, hired locals, rented an office and after registering with UNESCO and MAB we became on the map of biosphere reserves around the world	Expanded the reserve with time	management
We also communicated with scientists and environmentalists to study the flora and fauna in the region, the animals, and history	Conduct research in the reserve	education
We have trees flowers and animals which are only found in the Jabal moussa biosphere reserve. Jabal moussa is a mountain that starts at the highest point of Lebanon and has two rivers that pass through it, Nahr Ibrahim and Nahr Dahab which makes it a very important bird area during migration season. The mountain is 300 million years old according to the people and is a very important water reserve for the villages around it. The greenery not only gives oxygen to the environment but also serves as an important water reserve	Environmental importance of JM	Environmental importance

<p>The management team works a lot on preserving the water and international aids are encouraging the team to work on protecting other villages as well as historical archives. There are a lot of Roman ruins and inscription in the region. We are also working on preserving the roman stairs, inscriptions and ruins with the help of professionals.</p>	<p>A lot of history is found and preserved in the reserve</p>	<p>archives</p>
<p>we always update UNESCO with reports and also the international aids like the American embassy and USAID who support and fund us, and since it's on the international map we update all the funders and organizations as well as reports to the MOE even though the land is private, we still update them on the state of the reserve</p>	<p>Update all national and international funders</p>	<p>management</p>
<p>we submitted the land for the establishment of the reserve through different professors who have experienced and with the help of the Italian embassy who was the first to help us, we got help in writing and submitting a proposal because it has a special way, when we found the people who knew how to write the proposal, we submitted it and then people and inspectors visited the reserve to inspect the region as well as make sure the proposal is correct to give approval.</p>	<p>Got professional help to prepare documents to submit to UNESCO</p>	<p>establishment</p>
<p>it started with a local to stop the destruction of the mountain due to quarrying. It was his village and the destruction was next to his house, he realized that the only way to stop this destruction was to put a name on it which was turning the area in to a natural reserve</p>	<p>Established to stop the destruction of the land</p>	<p>establishment</p>
<p>And Pierre had enough power and connections to be able to get the permission to stop quarrying in the village. He used all his influence to protect the village</p>	<p>Used power and connections to stop destruction</p>	<p>establishment</p>
<p>When the region to be turned in to a reserve was decided, they established the NGO and talked to the land owners</p>	<p>They established an NGO and contacted all those</p>	<p>establishment</p>

<p>¾ of which belonged to the Maronite church and rented the land to be able to submit a proposal to UNESCO to legally turn the area in to a biosphere reserve.</p>	<p>who owned land to submit a proposal</p>	
<p>the idea started with the land, they focused on setting the boundaries and project plan to later on when officially having a proposal to UNESCO and initiating the project they would be able to involve the people because at the end of the day the people are a big part of the reserve.</p>	<p>First focused on the land and then involvement of the people</p>	<p>goal</p>
<p>not everyone was happy, in fact it depended on the people, those who did not have an interest from the reserve were very supportive and happy that the land and village and nature were going to be protected but some people those who were making a profit out of it through grazing, wood cutting etc. became against it because this project would be stopping their business</p>	<p>Not all the locals were supportive of the establishment of the reserve</p>	<p>perspective</p>
<p>many of the people understood that this was of their interest because even those who were against would eventually have no land if destruction was to be continued</p>	<p>Part of the people supported the reserve</p>	<p>perspective</p>
<p>The reserve still somehow managed to let those people work in the reserve through grazing and others but with some restriction and rules. Most people understood that this project was of their interest and for the benefit of their future.</p>	<p>They provided jobs for the locals</p>	<p>management</p>
<p>Comparing 10 years ago to now, more and more people have interest in the reserve and people come from all over Lebanon to come and breathe fresh air and escape the chaos of the city. In Lebanon, a lot of people don't realize the importance of nature, people don't go and walk in nature but now with the current economic situation and covid outbreak people are realizing that going on walks in nature are the only way they get to leave their house</p>	<p>The reserve has improved a lot with time</p>	<p>management</p>

<p>because its affordable and a source of fresh air.</p>		
<p>I think this was more of a wake-up call to the younger generation, the elderly saw it as a threat to their livelihood but the younger generation were excited to be involved in the natural reserve, they knew the village but they realized there was more to discover. They became guides others participated in the different activities, learning about the flowers, picking plants etc. the elders who worked directly with the reserve were impacted by it but other than that it wasn't as important as it was for the children, It was also difficult for the elderly because they would be the ones who would go on hikes. I think even when life starts going back to normal with restaurants reopening and other places, nature will still have a different meaning for them.</p>	<p>This reserve helped the younger generation connect and value nature</p>	<p>perspective</p>
<p>I think the team is doing a pretty good job and looking at other reserves they are doing very good taking also in to consideration the current situation of the country. And they took the peoples opinion as much as they could for example when I first opened my house as a guesthouse I opened it for myself and not for the reserve, but they told me what if you turn this in to a guesthouse for the reserve this way both of us could benefit and that's what I did. This was a way to get guests to the reserve because most of my guests have heard of the house not through the reserve but from their friends and relatives so they</p>	<p>The reserve helped locals communicate and have a relation with the reserve by providing jobs and helping them make an income</p>	<p>management</p>

<p>come to stay and then go visit the reserve as well.</p>		
<p>I think the reserve focuses a lot on their image rather than actually involving the people with the reserve, for example they say that they help locals with selling their products like jam, thyme and other products but the women who prepare them go to the kitchen maybe just 3 times a month and that's it. Or for example, instead of buying the products from locals of the village, they buy them from markets from villages outside the reserve which defies the purpose of the reserve. They focus a lot on showing visitors how they involve the locals by showing some examples of the products they sell when in fact the people don't actually work as much as they claim they do.</p>	<p>The reserve focuses a lot on their image, and how they look to visitors and donors but in fact don't involve the locals as much as they say they do</p>	<p>limitation</p>
<p>I wish it has changed the people's mentality but it needs time, because you still see construction in the region instead of stopping them to keep our trees and you still see a lot of people throwing trash and not recycling</p>	<p>It hasn't had that big of an impact on the people</p>	<p>limitation</p>
<p>Ghbale for example is not in the core zone it's in the buffer zone and the people who should be aware of the nature around them still don't clean up after them and throw trash all around. I think also with the Syrian crisis and overpopulation, there are a lot who don't care for the village because at the end of the day it's not their country or village so they throw the trash. I think the reserve should work on awareness for the people to not only take care of their garden and land but also the land outside their borders which are the streets to show them that its part of the biosphere reserve.</p>	<p>The people still don't take care of the environment and surrounding as much as they should</p>	<p>Limitation</p>

APPENDIX E

BR/ PA criteria Analysis

BR Criteria

Sentence	meaning unit	code
Encompass a mosaic of ecological systems representative of major biogeographic regions	representative of major biogeographic regions	biodiversity
Include a gradation of human interventions	gradation of human interventions	Human Interventions
Significance for biological diversity conservation.	significant biodiversity	biodiversity
Provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale	demonstrate regional sustainable development	sustainable development
Appropriate size to serve the three functions through appropriate zonation	three zones	human interventions
A legally constituted core area or areas devoted to long-term protection, according to the conservation objectives of the bio- sphere reserve, and of sufficient size to meet these objectives;	core zone	biodiversity
a buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the conservation objectives can take place;	buffer zone	human interventions
an outer transition area where sustainable resource management practices are promoted and developed.	transition zone	sustainable development
Organizational arrangements, involvement and participation of a suitable range of inter alia public authorities, local communities and private interests in the design and carrying out the functions of a biosphere reserve.	public private local planning and management	public private partnership

Mechanisms to manage human use and activities in the buffer zone or zones	Manage buffer zones	human interventions
A management policy or plan for the area as a biosphere reserve	management policy	management
A designated authority or mechanism to implement this policy or plan	designated authority	management
Programs for research, monitoring, education and training	program for research and education	research and outreach

PA Criteria

the establishment of well-defined, clearly-marked boundaries, their legalization in keeping with existing national mechanisms, and their effective management under a protection regime which gives due consideration to the natural, historical, cultural and socio-economic resources of the area.	well-defined, with legal boundaries following national mechanisms management under a protection regime which considers the natural, historical, cultural and socio-economic resources of the area.	zone
As part of the process of establishing new protected areas, or improving existing ones, the Governments should undertake a study of the legal and institutional systems and identify any changes that might be necessary to fulfill the national conservation objectives.	Governments identify any changes that might be necessary to fulfill the national conservation objectives increase the responsibility and participation of local populations allow for proper financing through the different possible mechanisms.	government implement national conservation objectives
This includes the legal and organizational measures that are intended to increase the responsibility and participation of local populations with respect to the management of protected areas as well as to allow for proper financing through the different possible mechanisms.	increase the responsibility and participation of local populations with respect to the management	management

<p>In developing plans and national budgets Governments should bear in mind that the establishment of new protected areas or the improvement of existing ones may be facilitated by consolidating the management capacity of the institutions responsible for the protection and management of those areas.</p>	<p>government to consolidate the management capacity of the institutions responsible for the protection and management of those areas</p>	<p>management</p>
<p>Traditional rights and interests shall be respected. The areas of indigenous groups and local communities shall be protected from activities that are considered to be socially, ecologically or culturally inappropriate.</p>	<p>traditional rights and activities respected</p>	<p>human activities</p>
<p>Governments should consider offering incentives for the establishment of protected areas owned or administered by or in cooperation with the private sector and non-governmental organizations. International experience has shown an increasing trend in the management of protected areas by community groups, NGO's, academic and research institutions, and private institutions which are making valuable contributions to the conservation of biodiversity. Notwithstanding this,</p>	<p>government to offer incentives in collaboration with private and NGO community groups, NGO's, academic and research institutions, and private institutions which are making valuable contributions to the conservation of biodiversity.</p>	<p>government incentives to conserve</p>
<p>Governments should monitor the management of these areas, which must be guided by national conservation objectives and strategies.</p>	<p>Governments should monitor management</p>	<p>government monitoring</p>
<p>Governments should give priority to those that need to be recognized within the framework of existing international or regional programs and agreements, as part of the global efforts being undertaken for the conservation of global biodiversity and world heritage.</p>	<p>government to align with global efforts for biodiversity and world heritage</p>	<p>government planning</p>
<p>As part of the process of establishing protected areas for biological conservation, Governments should undertake an evaluation outlining the</p>	<p>Governments should evaluate the economic importance of conserving these areas.</p>	<p>government economic evaluation</p>

<p>economic importance of conserving these areas for activities such as fisheries, forestry, water supply, coastal protection, tourism, recreation, agriculture or soil conservation. This is a key consideration in the decision-making process, as the protection of sites is likely to be more successful when economic benefits can be demonstrated.</p>		
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