

AMERICAN UNIVERSITY OF BEIRUT

EVALUATING THE MANAGEMENT OF BIOSPHERE
RESERVES IN LEBANON:
THE SHOUF BIOSPHERE RESERVE (SBR)
AS CASE STUDY

by
NORMA MARWAN AZZAM

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by
NORMA MARWAN AZZAM

Approved by:

Mona Harb
Signature

Dr. Mona Harb, Professor
Department of Architecture and Design

Advisor

Signature
Mona Harb

Dr. Salma Talhouk, Professor
Department of Landscape Design and Ecosystem Management Member of Committee

Mona Harb
Signature

Dr. Serge Yazigi, Adjunct Professor
Department of Architecture and Design

Member of Committee

Date of thesis defense: April 29, Year

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ABSTRACT OF THE THESIS OF

Norma Marwan Azzam

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Title: Evaluating the Management of Biosphere Reserves in Lebanon: Shouf Biosphere Reserve (SBR) as Case Study

Economic development in Lebanon has prioritized urbanization and shifted national priorities away from environmental and biodiversity protection, jeopardizing wildlife and increasing pollution, alongside the exacerbation of an unsustainable exploitation of natural resource. Land commodification and uncontrolled building development in towns and villages, particularly around touristic sites in rural areas have consumed and distorted large natural landscapes. Moreover, overexploitation, unregulated quarrying, forest fires, expansion of agro-pastoral activities remain entirely uncontrolled and further depletes resources, consecrating the exchange value of land over its ecological, cultural and social values.

Amidst these harmful environmental policies and practices, the Ministry of Environment managed to legislate the implementation of natural reserves and to implement some biodiversity conservation practices. This thesis takes the Shouf Biosphere Reserve (SBR) as its case study and investigates its making, its linkages to sectarian leaders' vested interests, and focuses on the governance structure of the reserve arguing that the management of BRs can benefit from adding planning principles to its conservation agenda. Based on a thorough review of management evaluation frameworks, coupled with the review of theories of (spatial) planning practice, I propose an evaluation framework combining both conservation and planning components to assess Biosphere Reserves. I use this framework, in addition to semi-structured qualitative interviews with landscape ecology experts and resource persons, and participant observation to assess the Shouf Biosphere Reserve's modalities of governance, management and planning. This assessment identifies key priority areas for policy intervention in the field of planning that can inform decision-makers engaged in the management of BRs in Shouf, Lebanon and beyond.

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ABBREVIATIONS

ACBR	Advisory Committee for biosphere reserve
ACS	Al Shouf Cedars Society
APAC	Appointed Protected Areas Committee
BR	Biosphere Reserve
CBD	Convention of Biological Diversity
CDR	Council for Development and Reconstruction, Lebanon
COED	Lebanon's Cost of Environmental Degradation
DGU	Directorate General of Urban Planning
ENGO	Environmental Non-Governmental Organization
EPI	Environmental Performance Index
FON	Friends of Nature, Lebanon
GDP	Gross Domestic Product
GEF	Global Environmental Facility
HCUP	Higher Council for Urban Planning
IBA	Important Bird Areas
ICC	International Coordinating Council
IUCN	International Union for Conservation of Nature and Natural Resources, World Conservation Union
LEF	Lebanese Environmental Forum
MAB	Man and Biosphere Program
MAP	Madrid Action Plan
MoA	Ministry of Agriculture
MoE	Ministry of Environment, Lebanon
MoIM	Ministry of Interior and Municipalities, Lebanon
MoT	Ministry of Tourism, Lebanon
MT	Management Team
NBSAP	National Biodiversity Strategy and Action Plan
NCC	Nature Conservation Center
PA	Protected Area
PAME	Protected Areas Management Effectiveness
PAP	Protected Areas Project
SBR	Shouf Biosphere Reserve
SDG	Sustainable Development Goals
SPNL	Society for the Protection of Nature in Lebanon
UNESCO	United Nations Educational Scientific and Cultural Organization
WCPA	World Commission on Protected Areas

CHAPTER I

INTRODUCTION

A. Introduction

Increasingly, Biosphere Reserves (BRs) are operated within a country's national and subnational legislative frameworks as ideal model regions contributing to achieve the Sustainable Development Goals (SDGs) and are systematically integrated in strategies for biodiversity conservation in land planning policies, communication and research programs (Kraus et al. 2014; Kratzer, 2018). The government of Lebanon lacks specific legislation related to BRs and only partially facilitates the circulation of sustainability practices through the revival of traditional land management practices (Matar & Anthony, 2020). The first Biosphere Reserve in Lebanon was designated in 2005: it is the Shouf BR; it was followed by Jabal Al Rihane in 2007, and Jabal Moussa in 2009. However, with the general absence of and poor implementation of environmental laws and regulations, Lebanon, which used to have a 25% green land cover, has reached the 13.4% threshold.¹

The literature on BRs is generally limited to assessing good management models and good governance of biodiversity conservation practices. The planning dimension of BRs, such as the spatial demarcation of the BR's zoning and boundaries, or the role of regional and territorial planning as a tool to bring together concerned municipalities, is often not incorporated in such models. As the thesis will show, this is a shortcoming that prevents a more integrated management model for BRs, one that takes into account planning tools and modalities into account. Using the Shouf Biosphere Reserve as its

¹ World Development Indicators (WDI). Online access: <http://databank.worldbank.org>

case-study, the thesis proposes an alternative assessment model for BRs' management, accounting for planning dimensions. Even though the recommendations are difficult to implement in the context of Lebanon which lacks effective decentralized planning systems, they are still important to be identified, given the fact that many BRs operate today in Lebanon and can benefit from improved management modalities.

The Biosphere Reserve's model differs from any other nature conservation paradigm. It requires managing and dealing with vast lands, where property rights remain unchanged upon the transition to a reserve, adopting a cross-sectoral and partnership-based approach to local and regional development, through strengthening existing laws and introducing new regulations in conjunction with local community engagement. In a context like Lebanon, implementing the BR model remains a challenge. BRs are under the jurisdiction of the Ministry of Environment (MoE), but actually operate as protected areas, without formal government support. BRs are protected to the extent municipalities follow through with a relevant legal framework and appropriate law enforcement. These institutions, and more generally, planning and management institutions in Lebanon, lack coordination modalities, mechanisms of public participation, and mechanisms of effective accountability and political autonomy (Harb, 2016).

Planning in Lebanon is operated in a highly centralized manner via top-down policies determined by a number of public institutions. Such policies and planning matters, generally, require procedures of collaboration between various ministries and public institutions; however, in Lebanon where guidelines that clearly define responsibilities, roles and relations between all actors are disregarded, their implementation remains complicated and minimalistic (UN-Habitat, 2013). Those key concerned public institutions include the Council for Development and Reconstruction

(CDR) the Directorate General of Urbanism (DGU), the Higher Council for Urban Planning (HCUP), the local authorities (municipalities and unions of municipalities), and other sector ministries. The CDR is a public institution that reports directly to the council of ministers, and, today, centralizes and allocates all international loans and grants to large-scale projects in the country (UN-Habitat 2013, Harb 2016). “The CDR acts independently; it has weak links with the DGU especially in coordinating plans” (UN-Habitat, 2013, p 35). The DGU, is part of the Ministry of Public Works, and the main planning actor that approves master plans, still conceived according to obsolete physical planning guidelines. The DGU is severely limited in terms of financial and human resources, “rendering it an obsolete institution notorious for its corruption and inefficiency, as well as its incapacity” (Harb, 2016). The HCUP includes representatives from several ministries who are responsible for advancing recommendations that guide urban planning. In terms of human resources, HCUP lacks the required expertise to address complex planning issues and implement concepts on local, regional and national levels. Hence, no central institution is effectively and successfully conceiving and implementing policies across the Lebanese territory.

Since the late of 1990s, politicians and non-governmental organizations have worked on formulating policy frameworks for decentralization, but none have been adopted. “Most decentralization efforts have amounted to a de-concentration of central government decision-making to territorial regional management units, administered by appointees from the central government” (Karam et.al, 2015, p. 26). Recently in 2013, Michel Sleiman, the former president of Lebanon, published a draft bill developed by a technical committee led by Ziad Baroud, the former Minister of Interior and Municipalities. The draft law is supposed to give regional councils (qada’s) more

authority and widen their scope, improve transparency measures through e-government and ICT, and institutionalize public participation mechanisms. However, demands for decentralization were often framed under the notion of federalism, which “awake(s) the ‘specter’ of the country’s division into sectarian cantons—a narrative closely associated to the civil war and the desires of some political groups to operate autonomously within their self-administered territories. Thus the central-regional-local debates in Lebanon are often fraught with these fears that tend to justify the centralization choice and demonize decentralization and autonomy of regional and local councils” (Harb & Atallah, 2015, p.192).

As such, decentralization faced several obstacles in Lebanon, and was partially implemented, ending up becoming a tool to control opposing groups and to instill greater authority at the local and regional level. It places representatives of the existing central structure at the local level with limited effective administrative, fiscal and technical resources and authority (Harb & Atallah, 2015). This resulted in allowing the political elites to expand their influence and interests at the regional and local scales. Most municipalities are unable to perform their mandatory functions such as delivering basic public services, ensuring public safety, guiding urban expansion and municipal area development. For instance, “63–70% of local expenditures are allocated to basic infrastructure works only, and planning is largely ad hoc” (Reforming decentralization in Lebanon, 2017). Largely because of these limitations, municipalities are understaffed and 75% of them cannot hire civil servants in order to fulfil their role (Sleiman, 2017). In addition to their fiscal dependence on the central government, lack of land management tools and lack of political autonomy have left municipalities in an arduous situation and reduced their ability to fulfill their duties and plan for sustainable local development

projects and policies rendering the decision-making and implementation process for BRs more complicated.

To date, there has been few attempts to integrate protected areas and natural important sites in a cross-sectoral, comprehensive and sustainable planning vision, namely through the National Physical Master Plan of the Lebanese Territory (NPMPLT), endorsed by a decree issued by the Council of Ministers in July 2009. This is a key document concerning regional and local development and planning in the country (Khechen, 2020). The plan sets a comprehensive framework and defines principles for regional development policies that aim at guiding major public investments while ensuring unity of the country, balanced development and rationalization of uses of resources (CDR, 2005). However, NPMPLT did not operationalize these principles into regional plans, and hence remains a reference document that has not been implemented at the regional and local scales (CDR 2005, Harb 2016, Kechen, 2020).

In the absence of effective public agencies, sourced public processes, and a well-coordinated state effort, planning practice in Lebanon worked both to reinforce the logic of territorial segregation by warring communities and enable the accumulation of private wealth from real estate transactions and land consumptions (Bou Akar 2012, Farah & Jacques, 2012, Farah, 2013, value 2009, 2014, Harb 2011). “The state is generally depicted as a weak one, moreover as a failure” (Davie 1994, Ashkar 2018). Its bureaucratic system is incompetent and ubiquitous, and its politicians constantly intervene to hamper urban planning policies and projects because of personal or clientelistic issues (Davie 2001, p.92). The Lebanese system is plagued with clientelism and “sectarian groups [are usually] grafted onto the state, scrounging public resources for private use” (Harb 2010, 13). Planning policies and projects have become a contest

between religious-political organizations and profit seeking developers (Bou Akar, 2019), and spatially reproduce urban violence, displacement and poverty. As such, Bou Akar argues that neighborhoods in Lebanon are envisioned and arranged, not on the basis of coexistence and environmental matters, but according to the logic of “the war yet to come”: urban planning plays on fears and differences, rumors of war, and paramilitary strategies to organize everyday life. Bou Akar (2012) highlights how masterplans in Lebanon are the materialization of “planning wars” (Bou Akar 2012, 165). Hence, the specter of “*the war yet to come*” is very strong, makes politicians use territories to fortify their strongholds, and serve their political agenda.

Moreover, real-estate was very much used as a long-term investment which allows reaping high profits in the rentier Lebanese economy—at least before it collapsed. It was also seen as an attractive investment due to the high number of expats and foreigners demanding it. Since the beginning of the financial crisis, the sector has also consolidated as a medium for depositors to limit haircuts on their bank deposits. The overview of the land policy framework in Lebanon shows well that multiple factors and practices over the past thirty years have heavily swayed the role of land towards a “real-estate asset” (Fawaz & Salame, 2019, Fawaz et. al 2021). Indeed, major regulations and policy interventions facilitate land acquisition and exchange (e.g. facilitation of property consolidation, digitalization of the land registry, easing land purchases by foreigners, reduction from all taxes, waving property registration taxes) while incentives extended to building developers (e.g. more intensive building exploitation rates, easier permit processing, waivers, exceptions (Saksouk & Bekdache, 2015; Fawaz et.al 2021, Public Works Studio 2021).

This centralized, fragmented and inefficient urban and planning governance structures negatively impact the elaboration and implementation processes of BRs in Lebanon, hindering them from becoming a significant tool in achieving balanced and sustainable regional development, improving local economy, and engaging local communities.

Typically, Biosphere Reserves are implemented to balance nature conservation with economic development, as they approach territorial development through a unified governance structure that ensures the continuity of natural sites and landscapes beyond narrow definitions of boundaries. However, the successful implementation of BRs depends on multiple factors in each country, including the collaboration and participation between relevant sectoral stakeholders, communities, and political elites, legal status of reserves, the flexibility of local authorities in interpreting the central planning policies and regulations so as to benefit BR management.

Regional and urban planners play a crucial role in the struggle against environmental, cultural and social injustice. Deliberative planning theorists have highlighted and emphasized the responsibility of planners in redistributing power, resources, and participation towards marginalized populations. Among the planning's theoretical models particularly relevant to environmental justice and regional development is the "Progressive Regionalist model" that calls for interdisciplinary collective action in order to achieve sustainability and social equity (Pastor Et.al, 2009). Critiques of deliberative planning highlight its inability to reach consensus and achieve a just society because of the acute imbalances of power between disadvantaged groups and political elites (Mazziotti 1974; Parker and Street, 2018). To encounter these challenges, scholars have been elaborating new forms of deliberative planning whereby planners are

encouraged to engage in direct politics and promote equitable cities and regions. It is with these deliberative planners in mind that this thesis was conceived. Indeed, I consider my role as one of those planners, seeking to advocate for a more integrated and spatialized approach for BRs' improved management, starting off from the case-study of the Shouf BR.

B. Research Statement

1. Thesis Argument

This thesis takes the Shouf Biosphere Reserve as its case-study and analyses its management and planning schemes in order to improve its operations. In 2005, against many odds, the Shouf Natural Reserve became a Biosphere Reserve and had to abide by the regulations of BRs, including integrating local communities' development of with the protection of biodiversity and ecosystems. This entailed many conservation strategies which will well-implemented, as the SBR won awards that testify to its good management. However, it also meant needing to incorporate privately owned lands inside the BR's core area and buffer zones, demarcating properly the boundaries, and consuming the resources at a sustainable rate, while elaborating effective mechanisms of local participation in its management system. This planning component of the BR management was less effective as the Reserve lacked the planning tools needed to address those requirements.

With that in mind, this thesis will investigate and assess the governance structure of the SBR focusing on its spatial planning components. Its working hypothesis is that the SBR implemented relatively effectively the conservation principles related to BRs, but did not manage to implement the spatial and planning components of BRs, namely

because of: (i) the entanglement of actors managing the biosphere, (ii) the lack of guidelines clearly defining roles, responsibilities and relations between all actors, especially local and regional governments, and (iii) ill-defined spatial planning and zoning boundaries. The main objective is to propose planning recommendations that can improve the governance and management of the SBR, from a spatial planning perspective.

More specifically, the thesis will examine the following questions: What are Biosphere Reserves and how should they be planned and managed? What is the place of spatial planning in BRs' management? How was the BR framework imported and implemented in Shouf? What is the place of spatial planning in this process, if any? How to mitigate governance challenges related to spatial planning in SBR, particularly with regard to delineating buffer and core zones?

2. Thesis Significance

This thesis will contribute to producing knowledge on the needed spatial planning modalities of governance that can help better manage BRs in Lebanon. Particularly, it will highlight the need to rethink regional planning modalities and tools to advance a more effective planning practice, across scales.

C. Methodology

This thesis articulates a normative research question as it seeks to assess how the BR framework was elaborated and implemented in the Shouf Natural Reserve, and how to ameliorate its management. The thesis also examines explanatory and descriptive research questions that explore a set of management and planning practices and that identify barriers to effective outcomes. This facilitated formulating planning

recommendations that enable a more effective implementation of the BR principles in Shouf. The thesis mainly uses evidence extracted from available data and from qualitative interviews with key experts.

This research started with a review of the environmental policy in Lebanon, its history, key players and shortcomings, and the rise of protected areas. The review was based on resources from both academic and media articles and helped me analyze the political-economic context of my case study. The evaluation of the SBR management in theory and practice is supported by a framework extracted from literature review, and by a desk review of available sources. Desk review of available sources include collecting and analyzing secondary *sources* which are publicly *available*. I adopted the Protected Areas Management Effectiveness (PAME) model developed by Marc Hockings in 2006, and updated by Matar in 2015. I enriched it with two additional inputs: the first from Van Cuong et al. (2016) on matters related to participation, delivery, designation particularly the regional integration and economic development indicators; and the second from Stern and Montz (2012), who are the authors who discussed more centrally the matters related to planning. Particularly, I integrated three planning products they recommend to add to the management models.

The thesis was further informed by the Delphi method which relies on conducting semi-structured interviews with key experts. Given the pandemic, I relied on AUB full-time professors (in the departments of Architecture and Design and in the Landscape Design and Ecosystem Management), as well as the reserve's previous and existing managers, as well as members from the management team. Moreover, I attended the Nature Conservation Center's (NCC) webinar series on "AUB activities in Lebanese

Biosphere Reserves” which provides a clear understanding of the Biosphere’s management schemes in Lebanon vis-à-vis the context and existing operation practices.

D. Thesis Structure

This first chapter introduces the topic, research problem and significance, and methodology. The second chapter is dedicated to a literature review that analyzes three management evaluation models of Biosphere Reserve, with the demonstration of global challenges that they face. The chapter culminates with the identification of an evaluation framework to assess the Biosphere Reserve in the context of Lebanon. The third chapter reviews the historical and institutional context of Lebanon’s environmental policies in general, outlines the environmental policymaking process of the Shouf BR, and profiles its characteristics, management model and the challenges it faces in terms of spatial planning. The fourth chapter evaluates the current status of the reserve based on the evaluation framework I discussed in Chapter 2 and the SWOT analysis I shared in Chapter 3. Finally, the thesis closes with a synthesis of main research findings and reflections on the main constraints that hinder the reserve’s effective planning system that should be addressed in future policy actions.

CHAPTER II

BIOSPHERE RESERVE AND DELEBERATIVE PLANNING: A REVIEW

The chapter is organized in four sections. The first provides a deep understanding of the Biosphere Reserve's concept definition and evolution by identifying its four main phases, or "generations". The second section examines evaluation models developed to better understand and assess BR's management strategies. The third section presents the global challenges of planning and managing BRs focusing on BRs located in the Arab region. In the fourth section, I investigate the potential contribution of planning practice, particularly deliberative planning, to enhance environmental principles in the management of BRs. The chapter closes with a proposed evaluation model for BRs that synthesizes existing models and incorporates power mapping and deliberative planning processes, in order to address matters related to land ownership and regional planning that often hinder the effective operations of BRs.

A. Biosphere Reserves: Definition and Evolution

In physical terms, Biosphere Reserves (BRs) are areas comprising coastal and terrestrial ecosystems internationally designated by the UNESCO Man under the Biosphere (MAB) Program launched in 1970s. MAB is an intergovernmental scientific program that aims to establish a scientific basis for the improvement of relationships between people and their environments (UNESCO 1996; Schaaf and Rodrigues 2016). Biosphere Reserves use a different approach to environmental protection than protected areas as they have a dual mandate of conservation and sustainable development (Axelsson

et al. 2011; Coetzer et al. 2014). They operate a shift from the traditional ‘segregation approach’, where nature conservation and human settlements are spatially separated, to an ‘integrative approach’ in which people and the environment interact in order to achieve and foster sustainable development throughout a region (Mose and Weixlbaumer, 2007; Phillips, 2003). However, “because core zones of Biosphere Reserve consist of protected areas, they have not been immune from these calls and concerns related to protected areas” (Ghimire, 1991; Nyakweba, 1993; Price, 1996; Reed and Massie, 2012). Since 1971, in response to the proliferation of international policies promoting the biodiversity and sustainable use of natural resources, BRs’ definitions, visions and approaches to conservation and development have been reviewed several times. The original vision of BR which was conservation of nature, was expanded to incorporate new approaches to regional sustainable development (Ishwaran and Persic 2008).

The literature identifies four main generations of BRs and highlights two landmark meetings: the Seville conference in 1995, which resulted in the *Seville Strategy for Biosphere Reserve* and the *Statutory Framework of the World Network*, and the Madrid meeting in 2008, which resulted in the *Madrid Action Plan (MAP)*.

1. Generation 1: From the first designation to the adoption of the Seville Strategy (1976-1995)

In 1970s, a Biosphere Reserve was envisioned as a category of *protected area* although its early definition included references to functions of conservation, development, and logistic support for monitoring, research, education and information related to local, national and global issues of conservation and development. The gradient functions (spanning conservation to development) were conceived to be associated to a land-use strategy in three main interrelated zones: a core zone, a buffer zone, and a

transition zone. First, the core zone fulfills the conservation function: it is a strictly demarcated protected zone for conserving biodiversity with clear boundaries, where only sound ecological activities and nondestructive controlled practices are permitted including monitoring and research (IUCN, 1987). Second, the buffer zone is considered like a filter around the core area and is used for cooperative activities compatible with sound ecological practice including tourism. Third, the transition zone is considered a flexible transition zone where a variety of sustainable activities including agriculture, settlements and other traditional practices in which local communities, cultural groups, management team, non-governmental organizations, researchers, and other stakeholders cooperatively manage to sustainably use the zone's resources.

Early designations of BRs were based on existing protected areas such as a natural park or reserve, and in most cases designations did not lead to the addition of new lands or new regulations. Hence, the *conservation* function was kept prominent while the development and logistic functions were largely forgotten (Batisse 1986; Price 2002). During the 1980s, the expansion into the *development dimension* became more effective, as noted in the Action Plan for Biosphere Reserve which was adopted by the International Coordinating Council of the Intergovernmental Program on MAB and observed that: "BRs, by definition and intent have economic and social benefits for local people, but also have value in demonstrating sustainable development tied to conservation in the wider biogeographical region" (UNESCO, 1989, p.7). Therefore, BRs started to be envisioned as site-specific platforms to explore how to balance between human efforts to protect biological diversity, the development of socio-economic conditions, and the preservation of a region's natural and cultural values.

2. Generation 2: From the Seville Meeting to the Madrid's (1996-2008)

According to UNESCO (1996), the Seville Strategy marked a shift in BRs' vision as they became distinct from protected areas to incorporate the entire range of landscapes and ecosystems. *Sustainable development*, characterized by a context-specific relationship between natural conservation and socio-economic growth became viewed as the essence of the governance and management of the BR designated areas (Batisse, 1985; UNESCO, 1996; Bridgewater, 2002). Based on the definition in the Statutory Framework of the World Network of BRs, UNESCO (1996) re-articulated a triple zonation scheme as follows: “[BRs carry]...a *conservation* function, to preserve genetic resources, species, ecosystem and landscapes; a *development* function, to foster sustainable economic and human development, and a *logistic support function*, to support demonstration projects, environmental education and training and research and monitoring related to local, national and global issues of conservation and sustainable development.” (UNESCO 1996, 18; emphasis added). Moreover, the *Statutory Framework of the World Network* “encouraged the creation of regional and thematic networks and established procedures for a periodic review of each biosphere reserve to be submitted every ten years” (UNESCO 1996, 20).

3. Generation 3: Madrid Meeting and Beyond (2008 – 2014)

In March 2008, the Madrid Action Plan (MAP) developed during the 3rd World Congress presented the vision of BRs as a “*learning site for sustainable development*”, building on the Seville strategic directions and aims at raising BRs to become international sites dedicated for sustainable development in the 21st century (UNESCO 2008). More significance was given to buffer and transition zones and their functions for development

and logistic support. As a result, UNESCO requested more rigorous requirements for BRs' management reporting as well as for zones' and boundaries' delineations (UNESCO, 2008).

4. Generation 4: The development of a new Man and the Biosphere (MAB) Strategy (2015 – 2025)

The MAB vision was revised to integrate a new strategic approach to “inspire a positive future by connecting people and nature today;” the programme planned “to reach sustainable development goals through learning from its network of model [regions/sites] where development policies and actions, and the stewardship of biodiversity and natural resources, are explored and demonstrated; and lessons learned are harnessed through sustainability science, education, and knowledge exchange.” (UNESCO 2015a, 7). Indeed, MAB Programme aimed to concentrate its support to Member States and stakeholders in addressing critical issues related to (1) conserving biodiversity, restoring and enhancing ecosystem services by fostering the sustainable use and management of natural resources; (2) contributing to health, equitable societies, economies and thriving human settlements in harmony with the BR; (3) facilitating sustainability science and education for sustainable development; and (4) supporting mitigation and adaption to climate change and other aspects of global environmental change. As such, as of 2015, the MAB initiative was intended to help UNESCO address the four sustainable development critical issues and achieve its goal of strengthening global and regional scientific cooperation in order to achieve the post-2015 development agenda. Thus, the World Network of BRs (WNBR) became considered one of the UNESCO's main international tools to globally develop the implementation of sustainable development concept and support the “transition to green economies by providing experimentation sites

for green development” (UNESCO 2015a, p.7). Today, the WNBR comprises 714 sites in 129 countries, including 21 transboundary sites, organized into regional networks (Biosphere Reserves, 2020).²

B. Management Evaluation Models of Biosphere Reserve

Managing a Biosphere Reserve has been considered by multiple scholars as a process of regional intervention, participation and governance as well as a form of change management. Existing scientific literature related to Reserves’ management effectiveness have mainly focused on identifying factors that influence the success of BRs or in determining compliance with the designation criteria, through the analysis of periodic reviews. Several studies focus on biospheres’ management approaches and seek to evaluate them. A number of evaluation models have been developed to better understand and assess BRs’ management strategies, and the extent to which they meet their goals, in order to identify opportunities for actors to improve their governance strategies and ways to mitigate challenges and threats (Hockings et al., 2006a,b; Lu et al., 2012). Hockings et. al (2006) argued that evaluation models can be considered as “a positive process, which allows us to correct and learn from our mistakes and build on success.” (pp. 635–636). This argument is widely shared in the environmental management literature that emphasizes the importance of systematic learning through evaluation, reflection, and feedback to improve the capacity to adapt to changing uncertain social, environmental, and economic circumstances (Plummer and Fitzgibbon, 2004; Berkes, 2010; Plummer and Armitage, 2010).

² (1) AfriMAB for Africa; (2) IberoMAB for Latin America and the Caribbean; (3) EuroMAB for Europe and North America; (4) ArabMAB for Arab States; (5) the sub-regional networks of Asia and the Pacific; and (6) the inter-regional REDBIO network. Regional networks are a key feature of the MAB programme and aim at fostering the exchange of knowledge and experience while promoting regional collaboration between BRs (UNESCO, 2017b).

Several evaluation models exist for assessing the compliance of a Biosphere Reserve with the requirements of UNESCO. A first evaluation system, the *Periodic Review (PR)*, was called for by Man and the Biosphere Program as part of the *Statutory Framework* after the Seville meeting (UNESCO, 1996). It specifies that “the status of each BR should be subject to a PR every ten years, based on a report prepared by the concerned authority, on the basis of the criteria of Article 4, and forwarded to the secretariat by the State concerned” (UNESCO, 1996, p. 18). The primary purpose of the periodic review process is to assess achievements of site management in relation to the triple zonation functions of BRs and investigate learning opportunities at national and international scales (Price et al., 2010; Coetzer et al., 2014). However, periodic reports focus only on Article 4 of the Strategy which is related to the BR selection criteria. Reed and Eguny (2013) investigated the management effectiveness of 11 Canadian biosphere reserves between 1995 and 2012 argue that PR is inadequate because it mainly focuses on evaluating the compliance with designation criteria rather than with the management and governance performance of the BR (Price et al., 2010; Reed and Eguny, 2013). Indeed, factors in governance and management have a significant impact on BRs\ effectiveness, namely issues related to “regional political support”, “leadership”, “law enforcement, and “evaluation of adaptive management” (Stoll Kleemann 2007). Additionally, the ten-year time interval between each review impedes the process of adjusting and adapting management action (Price et al., 2010; Reed and Eguny, 2013).

UNESCO-MAB tried to address the limitations of the Periodic Review reporting system, but there are still significant compliance challenges, delays, and lack of understandings on the ground to fully comply with the process. PR is a weak assessment tool that does not specifically evaluate management of BRs as it focuses on collecting

descriptive qualitative information about the context. BRs' authorities have called "for the development of a monitoring and evaluation system in order to systematically measure management effectiveness and improve information availability" (UNESCO 2014d, 7).

Given the limitations of the PR tool, scholars started experimenting with other evaluation frameworks. Over the past two decades, according to Price et al. (2010), evaluation models evolved along the lines of with the Protected Areas Management Effectiveness (PAME) standards, a framework designed by the International Union for Conservation of Nature (IUCN) and the World Commission on Protected Areas (WCPA). Hockings and colleagues (2006: xiii) describe PAME as providing broad criteria guidance about what to assess, using different methodologies which can be undertaken at various scales and over multiple scopes: over ninety PAME methodologies have been documented around the world, but many are unique to a specific agency or country, and only few have been widely used internationally. Most of these methodologies are based on three main assessment themes: (i) design issues, (ii) adequacy and appropriateness of management systems and processes, and (iii) delivery of protected area objectives. The PAME framework includes six complementary elements (context, planning, inputs, processes, outputs, and outcomes) for evaluating management.

The assessment cycle starts with understanding the site's *context* within which the institution is operating. It requires to gather information on values such as conservation which underpin management objectives, on the current status including the identification of particular threats and opportunities that are affecting its implementation such as socio-political influences and stakeholders' engagement, as well as the broader policy environment. According to Hockings et. al (2006), "this is not an analysis of management

per se, but provides information that helps put management decisions into context” (Hockings, M., Stolton, S., Leverington, F., Dudley, N., and Courrau, J. 2006, p:5). Assessment then proceeds with site design and *planning*, whereby data is collected on how the site is planned and if this is done in accordance to protected-area legislation, regulations, and policies, and how design elements regarding zones, shapes, sizes and locations affect the site’s ability to fulfill its stated purpose. This second assessment seeks to evaluate the adequacy of existing management plans and strategies. The model then evaluates in a third stage the *inputs* in order to measure the adequacy of available resources, focusing mainly on staff’s numbers, skills, funds, equipment and facilities. Adequacy of resources should be measured according to the scale of the task and taking into consideration other relevant standards. Fourth, assessment of management *processes* include the evaluation of methods of participation with local communities, of financial and management systems, of visitors’ protocols, and of procedures for cultural and natural resource management. Fifth, the model assesses *outputs* of products and services through examining the extent to which programs and plans have been implemented and carried out as conceived. Finally, the evaluation of *outcomes* investigates to what extent objectives set for local economic development, biological or ecological conservation social sustainability, and cultural heritage of the protected area have been met (Figure 1).

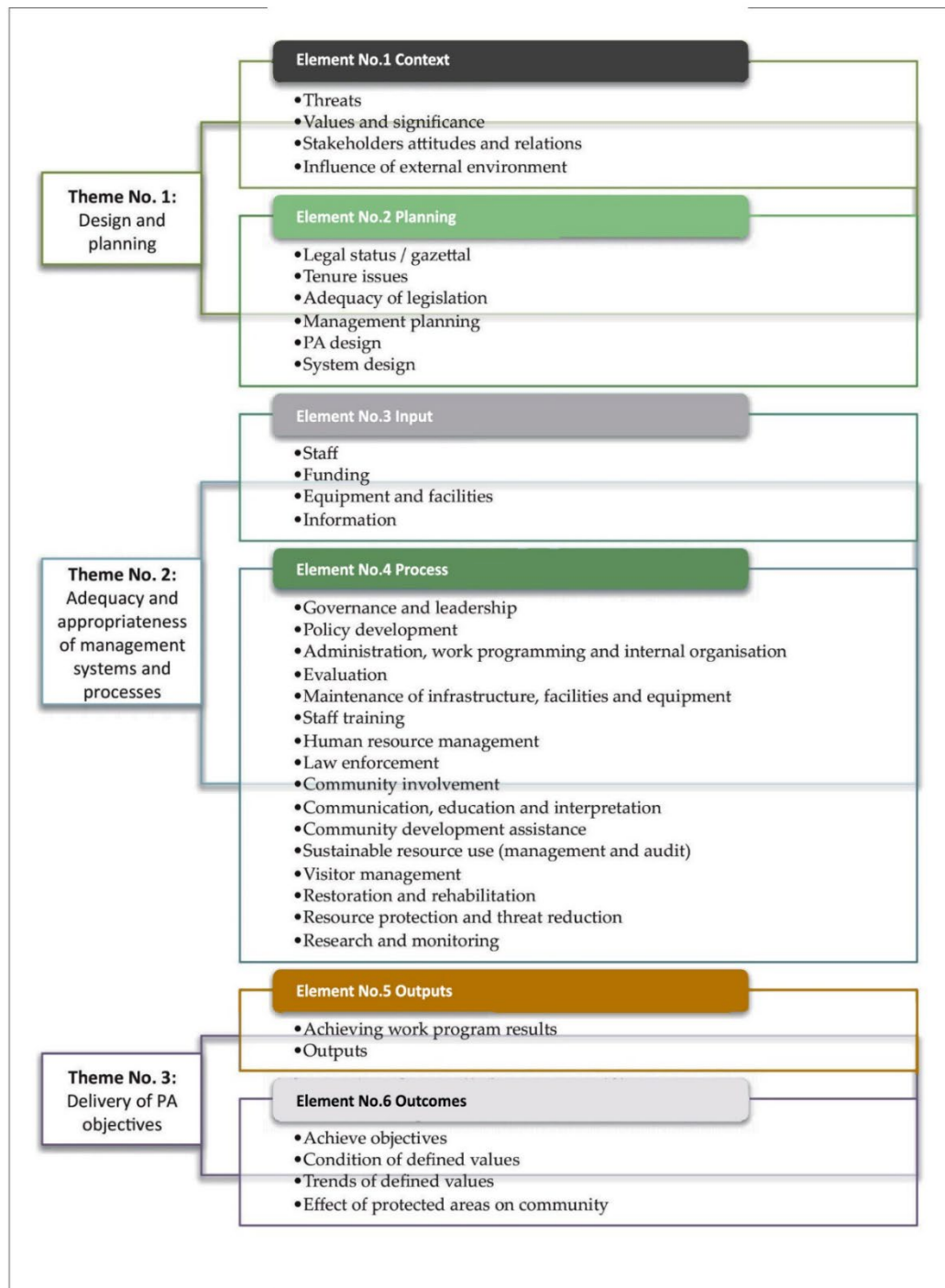


Figure 1: PAME Common Reporting Format - Headline Indicators

Source: Hockings et.al 2006, Edited by Azzam 2022

However, as Matar (2015) explains, the PAME evaluation model is developed for all types of Protected Areas, but does not account for specific characteristics of BRs beyond PAs. Matar thus proposed another framework, BREMi, which can be applied to BRs in the Arab region. The authors applied BREMi to assess BRs in Egypt, Tunisia, Algeria, and Morocco. In it, the 33 indicators of the 6 elements of the PAME framework (context, planning, process, input, output, outcomes) are revised to become 65 indicators. Indicators cover the complex structure of triple zonation and their functions (conservation, development, and logistic support), in addition to introducing a new indicator, “Education, Research, and Monitoring”, which assesses the logistic functions of a BR. In contrast to PAME’s scoring system on an interval of 0 to 1, BREMi assesses first the relative importance of each indicator to the BR, and then allocates a score from 0 to 10 for each indicator to allow for an adjusted comparison. In addition, the BREMi framework includes essential aspects of management that were not covered in the PR tool, as mentioned earlier.

A third evaluation model is worth mentioning. Developed by Van Cuong et al. (2016), it was applied in Vietnam, Germany, and Australia. Using the Delphi method, two rounds of questions were undertaken to identify factors impacting the success and/or failure of BRs. The model relies on mobilizing a list of experts who were requested “to nominate five successful BRs and five less successful BRs in the global network and identify up to five factors influencing the success and failure of each nominated site” (Van Cuong et al., 2017, p.15). After analyzing their answers, the authors identified factors contributing to the success or failure, and grouped into 11 entries shown in Table1. Afterwards, the 11 factors were rated based on 5 levels (ranging from critical to not important). Then, the identification of the significant relationships among influencing

factors were finalized and three key factors promoting and hindering the successful management of BRs were identified: participation, delivery, and designation (Figure 2). Participation includes governance, stakeholder participation and collaboration, and awareness and collaboration. Delivery includes management and implementation, financial resources, and economic development, while designation includes landscape zonation, monitoring, evaluation, regional integration, learning orientation and system thinking, and research linkage.

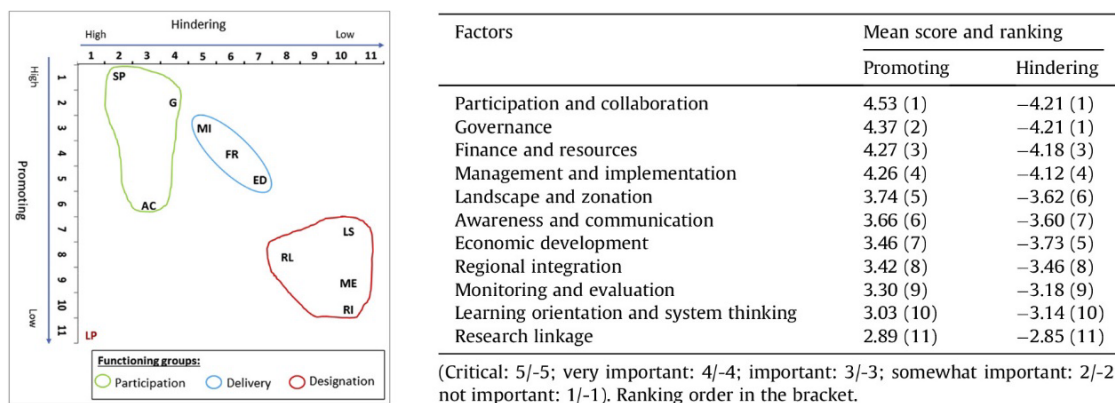


Figure 2: Factors promoting and hindering the management of BRs.

Source: Van Cuong et al. (2017)

C. Global Challenges of Planning and Managing Biosphere Reserves

Many evaluation reports have shown that there is a considerable gap between BRs' concept and practice (Ishwaran et al. 2008; Price 1996, 2002; Price et al. 2010), highlighting how the majority of designated BRs do not fulfill the criteria. While authors such as Stoll-Kleeman and O'Riordan (2017) identify the countries' sovereignty as a the major problem, as states are not obligated to provide support for BRs, others such as Kratzer (2018) point to the role of scientists who may not have the necessary knowledge to reduce the concept-practice gap, and to problems of policy formulation vs. implementation.

According to Solecki (1994), the zoning issue that specifies a gradual increase in the intensity of land-use as we move away from the core zone, across the three zones, is also associated with policy formulation vs implementation problems, in both developed and developing countries (Batisse, 1997; Reed, 2006; 2007a; Kellert, 1986). The literature also notes that this gap is related to challenges related to “local people’s fears (...) over the loss of local autonomy” (Heiman, 1988; Aitchson, 1989; Fink, 1991; Little, 1992; Mason, 1992a; Schonewald-Cox et al., 1992), as they assumed that the reserve status will prohibit their use of lands. For instance, in the United States, Solecki (1994) stated that conflicts occurred when the National Park Service developed a plan to apply a Biosphere Reserve around Yellowstone Park: locals perceived the recognition of the BR as a menace to their property rights. Moreover, political problems also challenge the implementation of Biosphere Reserves such as “lack of local political commitment, administrative capacity, and cooperation from other agencies operating in the area” (Belcher & Wellman, 1991; Clark et al., 1991; Buechner et al., 1992; Goldstein, 1992).

Furthermore, many authors agree that while they may often fulfill their role in securing the conservation of biodiversity, BRs experience significant management problems such as lack of institutional structure and capacity, limited financial resources, and weak or absent enabling mechanisms for local community participation in decision-making, and others (Ishwaran 2008, et al. 2008; Price 1996, 2002; Price et al. 2010; Coetzer 2013). Yamashita (2003) compared the management process of BRs to a “black box” where the process is solely dependent on each country’s legal and institutional arrangements. Several examples attest to this as discussed below.

In South Africa, according to the KBRC Strategic Plan which prepared by SETPLAN/DJ Environmental Consultants Joint Venture (2006), management challenges

facing the Kogelberg Biosphere Reserve (KBR) were classified according to whether they were legally or institutionally related to the key functions of BR (i.e. ecosystem conservation, socioeconomic development, and logistic/research). On the legal level, BRs in South Africa have no specific legal basis, which leads to major implications on the management model, thus constituting challenges on institutional bodies such as overlapping jurisdictions between statutory authorities. Factors further complicating the management process in KBR include the poor delivery capacity of local governments, a political unstable climate, and the difficulty of building effective partnerships between stakeholders (e.g. farmers, landowners, tourism operators, fishermen). This does not ensure the reserve's legitimacy and compromises community engagement. On the conservation and socio-economic levels, the unsustainable land-use practices of KBR's community impacts negatively the local environment, in terms of the heritage and biophysical spheres. A strong perception exists among community whereby it is believed that conservation does not deliver real socio-economic benefits related to the actual problems of poverty and unemployment. This perspective also contributes to KBR's lack of political support. Furthermore, the KBR is also challenged in its Spatial Development Frameworks (SDF) that do not reflect sustainability principles and do not support coordination. Finally, on the logistics level, the lack of monitoring systems of both environmental conditions and of management performance form an additional issue.

In the Czech Republic, Hungary and Poland, Schliep and Stoll-Kleemann (2010) identified how the lack of coordination between local institutions in charge of BR's management lead to miscommunication between actors, and as a result, a lack of participation. In Mexico, Brenner and Job (2011) underscored the challenges posed by deep-rooted conflicts among conservation-centered actors and other stakeholders

interested in capitalizing on natural resources for purposes of livelihood and profit. In Vietnam, Cuong et al. (2017) examined how ambiguous legal status hinders stakeholder engagement in BR, as they lack legitimacy and accountability in management practice. In Congo, Koy et al. (2019) noted that the participation of local communities in the governance of BRs is challenged by external and local factors, namely the marginalization of local communities during the design and implementation of local development projects, and the centralization of control with national and state authorities.

Furthermore, Matar (2015) identified main challenges of BR management in Egypt, Algeria, and Tunisia, namely the lack of communication of actor at all levels of governance including: “managing institution with central government agencies, BRs management staff with ArabMAB National Focal points and/or Committees, between different stakeholders involved in the management of the BR (when co-managed), and finally with regional and international UNESCO-MAB offices” (Matar,2015,p155), and weak capacity at the decentralized level. In Egypt, the inappropriate allocation of zones from the nomination phase impacts negatively the implementation of the triple zonation scheme. Additionally, the institutional structure suffers from poor governing bylaws which leads to weak control over land-use. For instance, in Omayed Biosphere Reserve, although the reserve has a clear demarcation of borders and the limits between public and private lands are indicated, illegal activities in agricultural usage are taking place in parts of a core area, on public land. In Algeria, in addition to inappropriate zonation from the nomination, Matar identified communication gaps at all levels, and poor branding and visibility of BRs nationally. In Tunisia, the management of BRs is weakened by many factors: the low capacity of management staff, unsustainable financing mechanisms, the lack of community involvement since the nomination phase, the entanglement of actors

managing the BR at all levels, absent nation legislation for MAB, and illegal practices as a consequence of political turmoil. Political unrest in Tunisia has had a negative impact on BRs by indirectly fueling illegal actions and weakening the government's capacity for law enforcement. According to Matar, during the revolution, the Ichkeul and Chaambi BRs, the two BRs with the largest national investments in Tunisia were both “attacked by their own local communities” because of their dissatisfaction with management. Tunisian government officials explained this dissatisfaction as the result of the lack of involvement of local communities in the planning and decision-making of the BR since the nomination phase” (Matar, 2015, p 152). Hence, the weakened Tunisian government by revolution resulted in a “shift of power” from the central government body to the local communities, who in turn expressed their discontent towards the BR designation, provides additional evidence that “command-and-control” and “top-down” models of BR designation and management increase vulnerability and lower effectiveness.

This section examined the main challenges of BRs’ planning and management, namely: (i) the absence or weakness of national legislation for MAB, (ii) poor institutional integration and alignment, and law enforcement capacity, (iii) broken communication between key stakeholders and lack of community participation in decision-making, (iv) the politically unstable climate, (v) resource and funding constraints. Many of these issues have been addressed by deliberative planning, which is a planning approach that puts communication with people for improved planning results as its central value. In what follows, I explain this approach and suggest it as a productive framework to integrate in the governance reform of BR.

D. Deliberative Planning

As previously discussed, communication and deliberation between different actors is a main challenge when it comes to the management of Biosphere Reserves (Bâtisse, 1982; Krugman, 1987; Cohn, 1988; Hough, 1988; West & Brechin, 1991; Brandon & Wells, 1992; Gadgil, 1992; Lober, 1992; Schonewald-Cox et al., 1992; Wells & Brandon, 1992). Indeed, participation of a variety of stakeholders (local residents, stakeholders, government officials, and environmental activists) is an essential prerequisite in the management and planning process (Brown, 2003; Pretty & Smith, 2004; Anthony, 2007; Reed, 2008; Andrade & Rhodes, 2012). Much of the literature reviewed above underscores how actors' active participation in processes of decision-making can greatly enhance the legitimacy of BR and hence their good management and governance. Participatory mechanisms create arenas for discussion and deliberation, and leads to the enhanced understanding of other people's interests (Stringer et al., 2006); they also enables power-sharing between communities to reach consensus (Hill et al., 2010); furthermore, participation permits a diverse range of societal interests to be represented (Kelsey, 2003; Sandström, Crona, & Bodin, 2014) and knowledge sharing in the management of the nature reserve (Kelsey, 2003).

Yet, there are a lot of critiques regarding participation in public governance in general and in biosphere reserves in particular. These relate to elite capture (Platteau, 2004), tokenism (Arnstein, 1969), information asymmetries and principal dynamics (Moe, 1984), and collective action problems (Ostrom, 1998). Challenges may also stem from differences in beliefs (Lundmark & Matti, 2015) and understandings among different actors (Treffny & Beilin, 2011).

The planning theory can provide with interesting approaches to address the matter of participatory governance. Early on, planners focused on “equality planning” which centered on the planner’s role as an advocate for powerless and marginalized people (Davidoff, 1965; Krumholz and Forester, 1990). These pluralist conceptions of interest mediation originated from the principle of the “common ownership of land,” which were adopted by equity planners who were against real-estate speculators and predatory industrial city forces (Krumholz 2015: 218).

Since the communicative turn in planning theory (Healy 1993), approaches have focused on processes of deliberation, i.e. the development of two-way conversations between planning authorities including governments and local communities, to substitute to the traditional notion of participation as forms of “community consultations”. Recent deliberative planning approaches are displayed under a variety of labels, such as “consensus building” (Innes, 1996; 2004), “collaborative planning” (Healey, 1997; 2003) and “deliberative planning” (Forester, 1999). They all support more equitable decision-making, positioning the planner as a moderator of power relations. Equity is thus an aspiration to be pursued through communicative and participatory communication mechanisms, where unheard or silenced voices are integrated into the decision-making process. As such, planners do not operate as community advocates developing participatory strategies on their own and “enabling” the involvement of marginalized people (Sandercock, 1998). Rather, their role should be to moderate discursive processes, ensuring they provide equal opportunities for participants, and are not controlled by existing power holders (Forester, 1989; 1999). Deliberative planners thus conceive the contribution of planning in broad social and economic terms and, according to Forester (1988), engage groups in an inclusive dialogue setting to reach consensus by overcoming

power imbalances. Forester promotes “a critical pragmatism” (2009, 2016b), arguing that democratic deliberations must interweave three practical concerns: (i) how to involve appropriate expertise, (ii) how to represent values, interests or concerns that matter, and, (iii) how to shape commitments to action. This tripartite process ensures that participation in planning decision-making process is democratic, as it provides opportunity for people who are ultimately affected by decisions to have an input, and combines the planning profession’s expertise with political engagement (Forester, 1999; Healey, 1997; Gleeson and Low, 2000; Innes and Booher, 2004, Krumholz, 2015). It is also a pragmatic process, in terms of effectively generating the support needed to translate plans into actions (Healey, 1997; Burby, 2003).

Young (2002) highlights four tenets which underpin the democratic deliberative process: inclusion, equity, rationality, and accountability. These principles are complementary and aid the process in maximizing viewpoints and interests, achieving rational results, promoting mutual respect and representation, broadening the horizon of decision-makers, empowering marginalized individuals and increasing accountability between actors, thus solving collective problems and reach an agreement. In the same vein, Fainstein's theory of the “just city” (2000) emphasizes the need to empower communities to resist inequality. These approaches inspired a “progressive regionalist approach” in planning which emphasizes the need to address the regional scale to mitigate social inequalities, advance economic efficiency, and reduce environmental degradation (Reece, 2018:306). This approach is based on highlighting, through communication and deliberation, interregional dependencies between all communities and identify the driving forces for a progressive regional change (Pastor Et.al, 2009).

During the late of 1980s and the early 1990s, the governance paradigm took over policy-making approaches, highlighting the need to transition from “participation” and “state vs. society relations” to an approach of “networks”, “deliberation”, and “interdependence” (Hajer and Wagenaar, 200, p1). In the context of neoliberalism, governments are no longer the sole actors in policy making, and need to devolve power and engage a multiplicity of stakeholders (private sector, interests groups, and community groups) to advance market interests (Bryson and Crosby, 1992). However, the resulting partnerships between state institutions and societal organizations, as well as between state institutional levels (Hajer and Wagenaar, 2003). However, Solé-Ollé and Viladecans-Marsal (2012), most of ten lead the private sector to wield the most power and influence, thanks to well-resourced developers allied with landowners who use lobbying strategies to influence decision-making in favor of a 'development-friendly' policy outcome, advancing market interests, at the expense of equity and environmental matters.

Consequently, equity planning approaches and tools of deliberation are greatly challenged by the domination of the planning practice by elites and the capitalist class, or what referred to as the “growth machine” (Grooms and Boamah, 2018). This largely constrains deliberative planners’ abilities to tackle spatial challenges and prioritize the principles of social justice, equity, environmental protection and sustainability, and inclusive economies. A main critic of deliberative planning, Flyvbjerg (1988) argues that spatial planning materializes the dominant political agenda, regardless of planners’ values and intentions, and hence displays simultaneously the progressive and representative faces of mainstream power (Flyvbjerg, 1996, 1998). As such, he emphasizes that planning has the potential to become a tool for societal control and disempowerment. Young (2001) also showed that the inclusive participatory approach in planning favors more powerful members of society, because they have the ability to dominate and control discussions

with their social, economic and political capital. The ambivalent nature of planning between progressive reformist goals and oppressive control was also highlighted by Yiftachel and others, who noted the “dark side of planning” (Yiftachel, 1995). Particularly, Yiftachel (1995; 2001) analyzed the planning as a conservative force leading to the institutionalization of a prescriptive planning practice where “urban and regional planning is not just a progressive arm of government, but also has the potential for *oppressing* subordinate groups” (Yiftachel, 2001: 117–118).

Therefore, these authors proposed placing power as the center of the planning process. Flyvbjerg (2002) suggests that both planning theory and practice should be driven by knowledge about the structures of power, about “who decides whether economic, social, geographic, or other knowledge gets to count as important” (p.3). Yiftachel (2001) advances that “planning cannot only be analyzed at face value, but driven by a societal matrix of power” (p.423). Still, beyond mapping stakeholders’ power distribution through a variety of tools, the planning literature remains unclear as how political power can be distributed in the decision-making process and vulnerable groups can be given more voice. Some indications point to the need for planners to become political players, such as Boamah and Grooms (2018) who highlight the need to bridge “planning’s power gap through the development, teaching, and practice of a political urban planning” whereby planners engage in direct politics through election campaigns and promote equitable cities.

E. Conclusion

As discussed in the first part of the chapter, the weak management of Biosphere Reserves is a problematic dimension that impedes their good governance. This issue has been noted by many scholars, including by the MAB agenda. However, there is no substantive response to this issue as noted by Getzner & Jungmeier (2009): “there is a

lack of systematic and holistic reflection and theory, as reflected in the fact that the management of Biosphere Reserves is considered a new scientific discipline”. This thesis suggests the integration of deliberative planning approaches and power-mapping as key tools to advance a better management process of BRs. Indeed, the planning tools that are partially included in BRs’ three zones’ delineation (namely land use planning) do not account for power structures that impede the good governance of BRs. The thesis will thus propose an evaluation model for BRs that incorporates power mapping and deliberative planning processes, in order to address the political issues related to land ownership and management that often hinder the effective operations of BRs.

Lebanon is a case study which features very well how private interests collide with planning practice (Fawaz & Krijnen 2010, Marot 2018). Throughout the postwar era, capitalists’ interests have been controlling the sectarian political system and constraining spatial planning and environmental policies. It is well known how the Lebanese political system is one based on sectarianism, in ways that weaken public institutions and allows the concentration of power in the hands of a handful of political leaders, who also seek to control these public agencies through employing their men in key leadership roles (e.g. as directors generals, municipal councilors, or key employees) (Leenders 2004, Salloukh, 2017). The environmental field is ripe with such corrupt practices, as will be discussed in the next chapter.

After this review, for my thesis I will adopt the PAME model developed by Marc Hockings in 2006, and updated by Matar in 2015. I will enrich it with two additional inputs: (1) from Van Cuong et al. (2016) on matters related to participation, delivery, designation particularly the regional integration and economic development indicators; (2) from Stern and Montz, who are the authors who discussed more centrally the matters

related to planning, particularly, I will integrate the three planning products they recommend to add to the management models. Stern and Montx (2004) provide a productive entry point to rethink BRs' management from a spatial planning and a deliberative approach perspective that can also address matters of power domination. They suggest the making of a BR statutory regional plan that enables the recognition of environmentally sensitive areas and thus prevent spatial interventions that can endanger their ecosystems. In addition to that, my review of the literature on deliberative planning and my interviews with key experts allow me to suggest additional indicators that are directly related to the discipline of planning. Based on this, the evaluation model I elaborated groups a total of 83 indicators: 58 from the initial PAME model and 25 new ones I introduced (Table 1).

Table 1: Updated Pame/Matar's Evaluation Framework for Biosphere Reserves

Source: By Author, 2022

Updated PAME/Matar's Evaluation Framework for Biosphere Reserves (including new indicators proposed by Azzam, 2022)	
Design/Planning	
A. Context	
A.1	Level of Significance
A.1.1	Key ecological values are identified and prioritized
A.1.2	Key socio-cultural values have been identified and prioritized
A.1.3	Potential for sustainable development is identified and prioritized
A.1.4	Site value for environmental research, monitoring and education is identified
A.2	Extent and severity of threats
A.2.1	Threats to nominated values are identified and severity evaluated
A.3	Constraint or support by political and/or civil environment
A.3.1	Civil and political contexts are favorable to management success
A.3.2	National authorities and leaders are supportive
A.3.3	Local community and civil society is supportive
A.4	Environmental Legislation and National Policy Framework
A.4.1	National protected area legislation is inclusive of BRs
A.4.2	BRs are integrated in the national strategies, development plans and laws
A.5	Regional Integration
A.5.1	Availability of a regional spatial plan
A.5.2	BR is related to or addressed specifically in regional spatial plan
A.5.3	BR plans promote the development of regional economy
B. Planning	
B.1	Main Planning Actors and Authorities
B.1.1	Effective land-use planning authorities
B.1.2	Land-use planning authorities account for BR
B.1.3	Effective decentralization regulations
B.1.4	Regional and local governments (municipalities/unions of municipalities) account for BR in their work
B.2	Tenure Issues
B.2.1	Land ownership status and related issues are well known
B.2.2	Issues of land tenure are accounted for in planning legislation
B.2.3	Land acquisition is adopted (i.e. purchasing or renting private lands)
B.3	Marking of Boundaries
B.3.1	Core Zone(s) boundaries are well delineated and defined (map/signage)
B.3.2	Buffer Zone(s) boundaries are well delineated and defined (map/signage)

B.3.3	The transition zone boundary is known
B.4	Appropriateness of design (for BR functions)
B.4.1	Size and zoning are appropriate and adequate to conservation, development and research
B.5	Management and Spatial Planning
B.5.1	The reserve is managed under one authority
B.5.2	A management plan for the BR site is developed and adequate
B.5.3	The review of the management plan is scheduled every 5 years
B.5.4	Adequate and appropriate planning processes are in place to enable effective management
B.5.5	Annual reports on the progress of management plan are available
B.5.6	A masterplan prioritizing conservation and regulating development is in place
B.5.7	A map of cultural and landscape landmarks and areas is available
B.5.8	Subsidiary plans are available (e.g. ecotourism, fire emergency)
B.5.9	Tools to manage impacts of planned projects and strategies on natural resources are developed and implemented
B.5.10	The reserve management/strategic plan follows the adaptive management process (measure, review, re-evaluate, and report)
B.5.11	Management targets specific to the site values are determined
B.5.12	Indicators to monitor progress towards set targets are developed
B.5.13	Periodic Review is submitted every 10 years
Adequacy/Appropriateness	
C. Input	
C.1	Adequacy of Staff Numbers
C.1.1	Staff number is adequate for effective management of the BR
C.1.2	Staff is adequately allocated to reach management objectives
C.2	Adequacy of Current Funding Mechanisms
C.2.1	Funds necessary to reach set management objectives are available
C.2.2	Available funds are allocated based on management activities
C.3	Security and Reliability of Funding
C.3.1	Funds for the achievement of management objectives are secured
C.3.2	Sustainable financing mechanisms are in place
C.4	Adequacy of Infrastructure, equipment, and facilities for management
C.4.1	Appropriate equipment, vehicles and facilities are available
C.5	Adequacy of Relevant and Available Information for Management
C.5.1	Resources for monitoring set indicators and targets are available
C.5.2	Information needed to adequately manage the site is available

D.9.2	Visitor's impacts on Reserve's natural and cultural assets are controlled and sanctioned
D.10	Natural Resource and Cultural Protection Activities Undertaken
D.10.1	Activities to conserve natural resources are implemented
D.10.2	Activities to protect cultural resources are implemented
D.11	Threat Monitoring
D.11.1	Major threats are monitored and reported
Delivery	
E. Outputs	
E.1	Achievement of set work program
E.1.1	Planned targets/objectives are being achieved
E.2	Results and outputs are produced
E.2.1	Planned outputs of work program are delivered
F. Outcomes	
F.1	Conservation of Nominated Values
F.1.1	Condition of the cultural heritage is well maintained
F.1.2	Natural integrity and biodiversity values are well maintained
F.1.3	Threats to nominated values are controlled/reduced
F.2	Effects of BR management on local community
F.2.1	The BR socio-economically benefits local community
F.2.2	The BR does not aggravate inequalities or generate new inequalities
F.2.3	The BR enables spatial integration and does not cause spatial fragmentation/segregation
F.3	Education, Research, and Monitoring
F.3.1	Environmental awareness has increased based on activities
F.3.2	The site is regularly used for environmental research and monitoring

CHAPTER III

NATURE CONSERVATION AND ENVIRONMENTAL POLITICS IN LEBANON

This chapter reviews the historical and institutional context of Lebanon's environmental policies in general and outlines the environmental policymaking process of the Shouf BR. It explores why and how the idea of protected areas emerged and which model of management has been opted for. I start with an overview of the state of the environment in Lebanon, highlighting the challenges of environmental conservation. I then focus on the role of environmental NGOs (ENGOs), activists who were able to transmit and the translate the "nature reserves" policy idea from the international sphere to the national sphere, hence influencing the agenda-setting and policy formulation phases of the policymaking process. Finally, I present the SBR, its characteristics, management model and the challenges it faces in terms of planning and management schemes.

A. Nature Conservation and Environmental Politics

1. State of the Environment

Since 1975, the devastation caused by Lebanon's civil war has had a negative impact on the environment. During the post-war reconstruction phase, social justice and environmental issues were mostly disregarded. Economic development has favored urbanization and shifted national priorities away from environment and biodiversity more specifically, threatening wildlife and increasing pollution whereas social instability has exacerbated the unsustainable exploitation of natural resources (MOE 2002). This goes hand in hand with a loose enforcement of laws that protects

natural resources. After the war, when the Ministry of Environment (MoE) was created in 1993, it operated with a very small budget. High political instability in the country delayed many administrative processes in the MoE and funding environmental policies, including the management of protected areas, remained scarce. Since 2019, Lebanon's compounded crises (political instability, financial and economic collapse, the Covid-19 outbreak, and the massive explosion in Beirut's port on the 4th of August, 2020) have added detrimental effects on the environment, in general, and, contributed to the deterioration of the fragile natural ecosystem in particular, given the immense added pressure on resources (Khater & Hajj, 2012).

A key impediment to an effective environmental management paradigm in Lebanon remains the fact that environment is not considered a national priority. Given the Lebanese political elites' push and pull mentality, it is hardly surprising that political will is not concentrated on critical environmental and social challenges. This, combined with a lack of environmental awareness among political leaders and the general public, has exacerbated the country's environmental degradation. Instead of addressing urgently alarming ecological problems such as overexploitation, deforestation, and nature conservation, emergency-based management is the norm, and long-term considerations in terms of setting environmental policies is rarely effective (Krupp et al., 2009).

In terms of numbers, in 2020, Lebanon's Environmental Performance Index (EPI)³ score was 45.4/100, a decrease from the 2010 level of 57.9. From 2012 to 2016, the score increased significantly (from 47.35 to 69.14), then decreased

³The Environment Performance Index (EPI) was developed to rank 180 countries on 32 performance indicators in the following 11 issue categories: waste management, pollution emissions, climate change, biodiversity and habitat, air quality, sanitation and drinking water, water resources, agriculture, heavy metals, and fisheries. "These categories track performance and progress on two broad policy objectives, environmental health and ecosystem vitality" (SEDAC, 2021). The higher the score over 100, the better the country's environmental performance in terms of environmental sustainability. In 2008, Lebanon's EPI score was 56/100.

slightly in 2018 (61.08), before reaching its present level in 2020. In 2018, Lebanon's Cost of Environmental Degradation (COED) was estimated to be 4.4 percent of its national Gross Domestic Product (GDP), or USD 2.35 billion (MoE/UNDP, 2019), compared to 3.4 percent in 2000, or USD 0.56 billion (World Bank, 2004). Air pollution contributed to the highest cost and amounted to USD 0.89 billion equivalent to 1.6% of GDP. The coastal zone degradation amounted to USD 0.08 billion, equivalent to 0.1 % of GDP, whereas the cost of degradation of forest, rangeland, cropland and quarries estimated to cost USD 0.6 billion annually, equivalent to 1.1% of GDP, and comes predominantly from the rehabilitation and better management needed from 1,330 active and passive quarries covering an area of 56.2 km² in 2018. Finally, lack of proper solid waste management accounted to a cost of USD 0.2 billion annually or approximately 0.4% of the GDP. The cost to the global environment was estimated at the amount of USD 1.52 billion equivalent to 2.8% of the GDP per year, represented as biodiversity losses and Lebanon's carbon footprint (CO² emissions) on the global the environment (MOE, 2018). Such estimates indicate that environmental degradation in Lebanon is becoming severe, and the need to prioritize the setting of an effective environmental action plan on all levels is a necessity.

Lebanon exhibits a wide range of bioclimatic conditions, resulting in increased diversity in ecosystem, habitat, and microhabitat variation, allowing for a diverse range of biological elements to exist and a number of endemics to typify its landscape (MoA/UNEP/GEF, 1996; Asmar, 2011; MoE/GEF/UNDP, 2019). Despite the fact that Lebanon occupies only 0.0007% of the world's land surface area, it hosts a high percentage (12%) of endemic terrestrial and marine plant

species (MoE/UNDP, 2011; NBSAP, 2016). However, as the rate of degradation has increased, environmental pressures on the natural ecosystems have amplified, and diversity is highly threatened. Forests currently constitute 13% of the country's area, according to the Lebanon Country Report under the Global Evaluation of forests Resources (2020), after comprising 70% hundred years ago (Khater &Hajj, 2012; Sattout & Zahreddine, 2013). Current anthropogenic activities are having a negative impact on Lebanon's natural environments (Talhouk et.al, 2001). Urban expansion and uncontrolled building development (in and around towns, tourists resorts in rural areas) have consumed and distorted large natural landscapes, while overexploitation, unregulated quarrying, deforestation, overgrazing, forest fires, expansion of agro-pastoral activities and hunting remain entirely uncontrolled and haphazard in rural areas, further depleting resources. Talhouk et al. (2001), emphasize that such uncontrolled and unregulated activities in rural areas "prevent the regeneration of young trees, destroy the vegetation underneath the trees, and increase the likelihood of erosion and ecosystem decay" (Talhouk et al, 2001, p 2). Today, about 1,746 species are reported to be threatened with extinction of which 12% are plants, 13% are mammals, 12% birds, 5% reptiles, and 0.5% amphibians (El Shaer, 2017). In addition to that, the country loses an average 1200 to 1500 hectares (12-15 square kilometers) a year because of wildfires (Zaatari &Hamdan, 2020).

As a response to these environmental threats which have been increasing at an alarming speed, protected areas were identified by the Ministry of National Economy with the aim of conserving what is left of Lebanon's nature and biodiversity (Laymen, 2006). Practices of nature conservation in the country are

inherent to the livelihoods of rural populations who have put in place a range of sustainable natural resources management systems (Moledor et.al, 2016; Talhouk et.al, 2018, Matar, 2019; Karam et.al, 2021). Lebanon offers a variety of in-situ conservation modules from nature reserves to micro-reserves, biosphere reserves, heritage sites and *hima*'s. To date, Lebanon has officially established 18 nature reserves managed by a committee, which approximately cover 2.5% of Lebanon's territory⁴ (MOE, GEF, UNDP, 2019): 19 natural sites are protected by the MoE through ministerial decrees. Besides natural sites, there are 25 *hima*'s established by the Society for the Protection of Nature in Lebanon (SPNL) on municipal land, as a result of municipal decisions made in partnership with municipalities and local authorities (SPNL, 2019). According to the SOER Report (2020), "the number of other types of protected areas has also increased; some with national designation including, 3 biosphere reserves (measuring 414 km², nearly 4% of the territory), 4 Wetlands of international importance (Ramsar sites), 5 World Heritage sites, Important Bird Areas (IBAs), and 17 protected forests". Some of these sites and nature reserves have received worldwide recognition in the form of one or more international designation.

B. Protected Areas in Lebanon

1. *The Establishment of MoE*

One of the more impactful environmental policies in Lebanon has been the establishment of protected areas (PA). In the 1950s, the national environmental

⁴ Nature reserves alone occupy around 2.5% of the country's area (MoE, 2019). The national biodiversity targets developed as part of the ongoing NBSAP (National Biodiversity Strategies and Action Plans which are the principal instruments for implementing the CBD at the national level), state that: "By 2030, at least 20% of natural ecosystems are protected and all types of ecosystems are represented in the PA network."; and "By 2030, the total area of nature reserves is increased to reach at least 5% of Lebanon's area." (MoE, 2019).

movement started with what Faysal Bou Ezzeddine, consultant and environmental activist, refers to as “early pioneers.” Those included Kamal Jumblatt, Member of Parliament (MP) and Minister of Economy, Agriculture and Social Affairs, who initiated the first hunting laws (June 18, 1952), and Hussein Kaed Bey, who established the Lebanese League for Bird Preservation⁵. Hence, early environmental efforts in Lebanon were elite-centered and relied on personal initiatives with local-scale impact, mostly motivated by ecological interest.

In the late 1970s and early 1980s, a new movement began, with middle-class environmental activists forming ENGOs in various areas. As a result, among the first environmental organizations were the Society for the Protection of Nature in Lebanon (SPNL) in Beirut, Friends of Nature (FoN) in the Metn region, and the Environmental Protection Committee (EPC) in Tripoli. Because the Lebanese civil war prevented any type of interaction or coordination among them, their work was limited in scope.

In the late of 1980s, Ricardo Haber, a noted botanist at the American University of Beirut, was considered a leading pioneer environmentalist in Lebanon who actively worked in creating protected areas in order to conserve Lebanon’s biodiversity. Haber’s most notable policy achievement was lobbying Sulaiman Frangieh, the patron of Zhgorta region, along with other seven families in the region for the establishment of a nature reserve in Horsh Ehden (Makdisi 2012, Kingston 2001). Similar lobbying campaigns by Haber and other notables from Tripoli resulted in the environmentally significant Palm Island being protected. In 1992,

⁵ Also, among the early pioneers were scientists and academicians such as Georges Tohmé, ecologist and president of the Lebanese National Council for Scientific Research (LNCSR) since 1993, a dedicated champion of the fauna and flora in Lebanon, and Aftim Akra, Professor at the School of Public Health, American University of Beirut.

“the Haber’s efforts culminated in the formal establishment of Horsh Ehdén and the Palm Islands as protected areas by the Council of Ministries” (Kingston, 2001, p 61).

Between 1985 through 1995, the environmental movement experienced a significant growth, due to the influx of international funds, particularly following the 1992 Rio Conference. New notions in the environmental field such as biodiversity conservation, and the sustainable development principle, influenced the concept of the “protected areas” and translated it into various international conventions, the most prominent of which is the Convention for Biological Diversity (CBD). As such, several NGOs redefined their goals and became less militant and more institutionalized, focusing on projects such as reforestation, conservation, and awareness campaigns, which restricted the groups’ field of action and independence (Kingston, 2001, p.65). For instance, the Lebanese Environmental Forum (LEF) was founded in 1992 by a group of national ENGOS (Kingston, 2001, p.66). The organization's purpose was to preserve the environment from man-made disasters. Its main goals were to coordinate ENGOS' operations in Lebanon and collaborate with various government institutions. The LEF succeeded in obtaining funding from national and international agencies, implementing environmental initiatives on local and national levels, and contesting government policies. It formed alliances with international non-governmental organizations (INGOs), which, as will be addressed later in this thesis, gave them an advantage over others in terms of influencing policymaking.

In 1992, Lebanon signed the CBD in Rio De Janeiro Earth Summit. Following its ratification in 1994 (Law No. 360/94), “the government developed its

National Biodiversity Strategy and Action Plan (NBSAP)” (Talhok et.al, 2006, p 108). Among many stated goals, the NBSAP aimed at “conserving biodiversity under natural conditions and establishing a balanced ecosystem where plants and animals evolve naturally,” as well as “expansion and management of the protected areas system in terrestrial, marine, and fresh water environments,” along with the translation of “protected areas” policy idea. The idea, which was circulating internationally, drew the attention of national environmental activists, who aimed to raise it as an issue on the decision-making agenda. As such, nature reserves were funded by the Global Environmental Facility and implemented by United Nations with the technical and administrative guidance of the World Conservation Union (IUCN) under the execution of the MoE and LEF.

On April 2, 1993, the Ministry of Environment (MoE) was established by Law No. 216 as the official governmental institution responsible for the environmental protection in Lebanon. Kingston (2001) relates its creation to the post-war as a “lobbying” process for the environmental movements that has been taking place, and of ENGOs particularly who saw the need for a national government entity to address environmental issues. Until 1993, the responsibility of environmental issues were mostly divided between the Ministry of Agriculture (MoA) and the State Ministry for Environmental Affairs. Before the existence of MoE, two consecutive governments established a state ministry for environmental affairs. Additionally, it is also argued that the MoE was established in response to international pressure on the Lebanese government as a necessary step to ensure "green" grants and loans.

In 2005, Law No.690 was issued to organize the MoE into seven units: the registrar, environmental guidance, urban environment, natural resources, environmental technology, planning and programming, and regional departments and environmental police. The law entails a detailed description of the responsibilities of the MoE. Those include environmental policymaking (national and international), trans-sectoral environmental management, defining standards and recommendations procedures for managing natural and urban environment, as well as performing periodical sampling of water, air, and soil. The minister is also expected to head the national council for the environment, a multi-stakeholder body comprised of various ministries, as well as civil society organizations such as professional syndicates and NGOs, among other responsibilities.

Prior to the establishment of the MoE, protection of the natural environment was originally under the mandate of other public administrations including the Ministries of Agriculture (MoA), of Transport and Public Works, and of Tourism (MoT). To date, some of these governmental institutions still perform environment-related duties. Protected area management, for example, is shared among the MoA, the MoE, and MoT. The MoA is responsible for the management of protected forests and Himas, whereas the MoE is responsible for other sorts of nature reserves and natural areas. The MoT, on the other hand, governs the maintenance of natural landscapes designated as touristic attractions by decree.

Today, after thirty years of establishment, although the number of employees has increased, the ministry remains understaffed and incapable of meeting the challenges of environmental management. According to *The State of the Environment Report (2020)*, “MoE staff’s actual size has never reached 50% of the

required positions set by the regulations, which themselves have become inadequate given the increased challenges in the sector”. Given the limited number of staff, the MoE has been sub-contracting various projects with funding from the European Union (EU). It has been reaching out to EU’s expertise and experience to improve environmental performance through reforming environmental governance, and to implement various activities and functions related to legislation, research, training, monitoring and environmental awareness.

Furthermore, the budget of the MoE is one of the lowest among the government ministries. According to MoF records, MoE’s annual budget steadily increased during the period of 2010 until 2018, reaching LBP 14 billion (USD 9.3 million) in 2017 and 2018 but decreased by 12.9% in 2019 to reach LBP 12.3 billion (USD 8.2 million) and LBP 8.9 billion in 2020 (less than USD 1 million at the current exchange market rate) (SOER). With such a low budget, the capacity to procure consulting, operational and maintenance services is extremely limited.

2. The MoE and the Policy-Making

According to the law 690/2005, environmental policies, laws and strategies are proposed by the MoE. Since environmental issues are trans-sectoral by nature, other ministries such as MoA, MoT, MoIT may also suggest policies which could affect the environment. As such, in order to facilitate coordination between these different ministries, the MoE established the National Council for the Environment (NCE) which consists of fourteen representatives⁶ from the public and private

⁶ The fourteen members as follows: Seven representatives of the ministries of Environment (represented by the Minister), Finance (MoF), Interior and Municipalities (MoIM), Agriculture (MoA), Public Works and Transport (MoPWT), Energy and Water (MoEW) and Industry (MoI) whose representative is designated by the relevant minister.

sectors, in 2012. Among other duties, at legislative level, the NCE is responsible for preparing draft laws and regulations to protect the environment and ensure sustainable use of its resources.

Multilateral Environmental Agreements (MEAs) constitute an important source for environmental policymaking in Lebanon. *International conventions and treaties such as the Rio Earth Summit set the basis for nature reserves and environmental protection policies in Lebanon.* For instance, the Environment Protection Law No. 444/2002 includes principles attributed to texts of international environmental agreements. Among those are sustainable development principle, the precautionary principle, the preventive principle, and the polluter-pays principle.

As of 2021, Lebanon is the signatory of more than 25 international environmental agreements, treaties, and conventions related to terrestrial and marine biodiversity conservation. Ratification of treaties conforms to national priorities set by the MoE. After signing a treaty, the MoE propose a project decree including the provisions of the treaty to the Council of Minister (CoM). Once approved, the decree is transferred to the Parliament as a project-law. Upon the issuance of the law, the Ministry of Foreign Affairs sends it to the Secretariat of the treaty for review.

The MoE has taken several actions to reduce activities that threaten the environment, notably through the adoption of environmental policies and treaties. Nevertheless, since its establishment, many factors have contributed to its weakness

Seven representatives of the private sector: Presidents of the Order of Medicine in Beirut / Tripoli (alternating), Order of Lawyers in Beirut / Tripoli (alternating), Order of Engineers in Beirut / Tripoli (Alternating) and Association of Banks and Association of Insurance Companies, head of a group of at least 20 environmental NGOs and assigned representative of the academic sector.

as a governmental institution. The MoE has suffered from long awaited legal and institutional tools to give the needed power to perform its mandate. For instance, some draft regulations require many years before enactment, the Environmental Protection Law No.444 was only issued in 2002, nine years after the establishment of the ministry. Additionally, some of key application decrees such as the environmental impact assessment (EIA), the strategic environmental assessment decree, and the compliance decree are tools to manage impacts of planned projects and strategies on natural resources, were only enacted in 2012. This was ten years after the law for environment set them as a basis for environmental management in Lebanon.

According to the state of environment Report (2020), “upstream policy formulation in Lebanon is often lacking”. “Frequent cabinet reshuffles further delay and jeopardize policy making as new governments and ministers tend to shelve previous policies, or policies still in the making, and start all over with a new team of advisors. This stop-and-go approach has indisputably also affected the state of environmental affairs in the country”. The MoE was granted an advisory rather than an executive function or role in the government; this consequently limited and minimized its impact at the level of public policymaking and decisions. Unlike other ministries, the MoE is frequently “left out” and is viewed as a political compromise during governmental appointments. Thus, lack of enforcement of nature reserves by MoE is related to such aspects such as insufficiency of public funding, overlapping duties and responsibilities with other ministries, deficiency in human and technical capacity. Strategies, management plans and budgets for Lebanon’s protected areas all require strengthening and additional assistance.

3. *Classification and Geographic Distribution of Protected Areas in Lebanon*

Initially, the label of protected area in Lebanon had been given by the Lebanese authorities (MoE and MoA) to a broad range of categories including: nature reserves, natural sites, himas, natural monuments, protected forests⁷, and other areas of high cultural value (MOE, 2006b). The lack of agreement between authorities on baseline definitions for classification led many sites to have overlapping decisions, such as Jabal Moussa for which two decisions were issued:⁸ MoA Decision 399/1 for 2008 declaring it a protected forest and MoE Decision 7494 for 2012 that classified it as a natural site. Recently, the MoE prepared a new categorization system for protected areas in the “Protected Areas Framework Law” number 130/2019 which defines the criteria of establishment of each category in addition to their management objectives and modality. Accordingly, protected areas are subdivided into four categories: nature reserves, natural parks⁹, natural landmark sites, and hima. Each category is established by a different authority or has a different legal basis. However, till today, neither the MoE nor the law has identified formal or legal criteria for each category such as site characteristics, management system, designation authority, or regulatory system (law, decree, decision). Hence, the criteria of each category remains undefinable and undetermined. Below, I discuss the four categories of protected areas.

Nature reserves are a marine or a land that requires protection of its habitats and ecosystems for the preservation of natural features, or species of special importance. They are protected by law if they are located on municipal or state

⁷ Protected sites by decision of the Ministry of Agriculture and based on the Conservation of Forest Resources Law (L. 85 of 1991).

⁸ Qammouaa (Akkar) for which two decisions were also issued, MoA Decision 588/1 for 1996 declaring it a protected forest and MoE Decision 19/1 for 2002 that classified it as a natural protect.

⁹ New category defined in L. 130/2019, but not established yet.

lands, or by decree in the case of privately owned lands after submitting a proposal to the Ministry of Environment (MoE). If the nature reserve is established on private property, the owner's consent must be obtained, and in the case of rejection, the MoE may request the acquisition of the property for environmental public benefit, for which the owner would be compensated. Once declared, the area would be conserved for at least 20 years. They are under the supervision of the MoE.

Natural parks are designated in the case of vast rural lands, some of which can be populated, and where the long-term relationship between nature and man distinguishes the place on the aesthetic, cultural or ecological levels. In most cases, they are characterized by a high biological diversity and have natural and cultural heritage, and distinctive natural features at the national level, making it worthy of long-term conservation. Natural parks are established by decree issued by the Council of Ministers (CoM) based on a proposal from the Ministries of Environment and of Interior and Municipalities following the request of concerned municipalities or municipal unions (SOER, 2020).

Natural landmark sites are areas having significant natural or cultural features that should be preserved due to their rarity, aesthetic features, or representative character. These sites are classified according to a decree based on a recommendation by the MOE.

The *hima* is a community-based natural resources management system that promotes resources conservation, environmental protection, and sustainable human wellbeing. It is a natural ecosystem with important biodiversity, ecological functions, and cultural values that should be protected. The site is distinguished by

the voluntary protection of its ecosystems, natural habitats, and cultural values by local communities using a traditional system of natural resource management based on their traditional abilities and skills. The decision to establish a Hima is made by the local municipal council(s). In the absence of a municipality, the Qaimaqam makes the decision based on the request of the area's mukhtar. The Hima's management is decided by the same entities.

The existing network of protected areas extends over the whole Lebanese territory, with a more notable distribution on the country's western flank, which is defined or delineated by the western chain of mountains that marks the eastern borders of the Northern and Mount Lebanon governorates (Mohafaza) (Figure3).

Among these categories, the focus of this thesis will be on the nature and biosphere reserves under the jurisdiction of the MOE. At present, there are eighteen nature reserves scattered across different areas of the country and varying between marine and forests nature reserves. Out of the eighteen nature reserves designated by law, fifteen are mountain forests (primarily cedar forests).

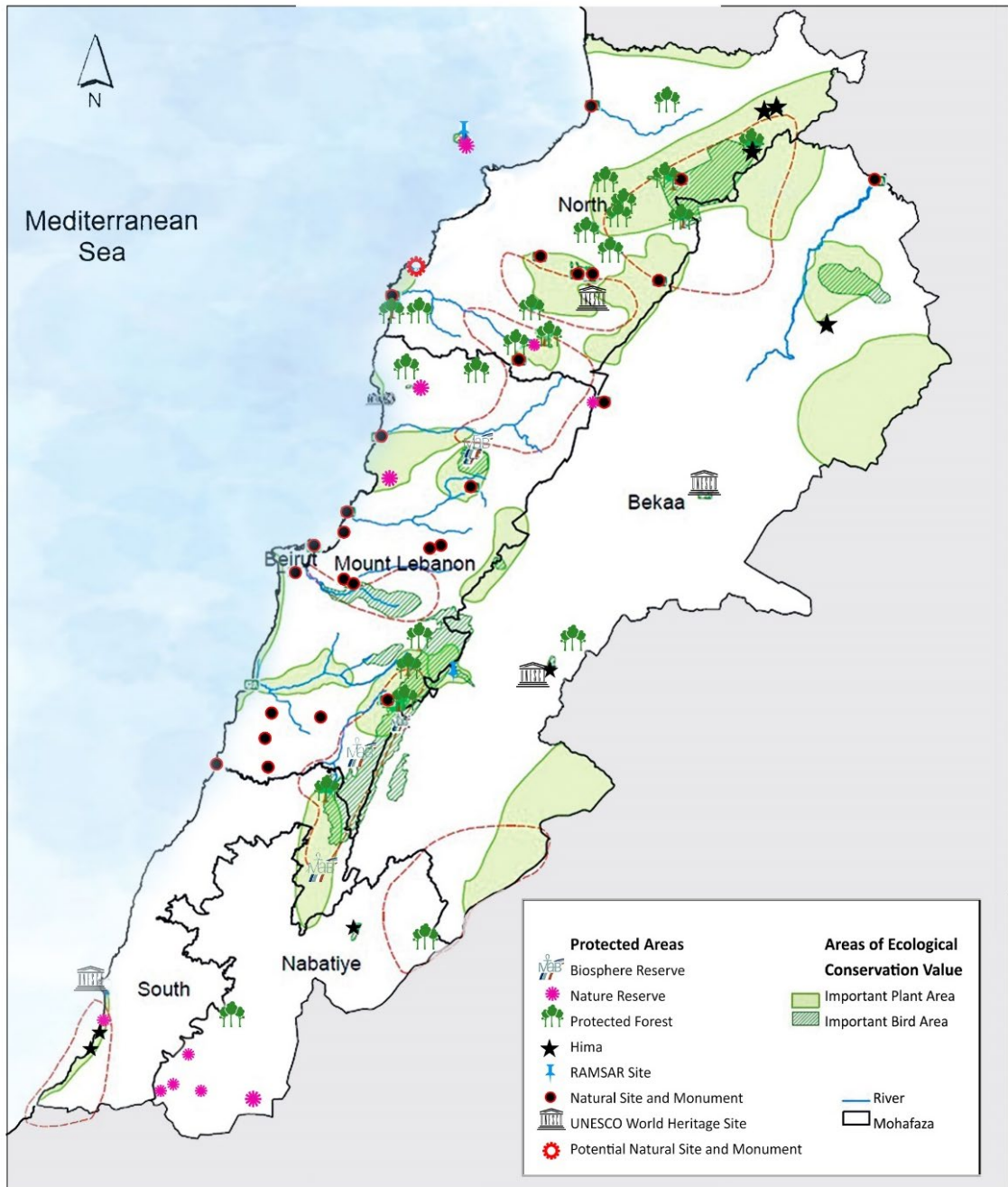


Figure 3: Geographic Distribution of Protected Areas in Lebanon

Source: Adapted from El-Hajj et.al. (2016)

4. Protected Areas: Management Structure and Major Actors

The Protected Areas Project (1996-2002) was the first initiative for the establishment of protected area networks. A nationwide project entitled “Strengthening of National Capacity and Grassroots in situ Conservation for Sustainable Biodiversity Protection”, it had a clear management structure coordinated by the MoE and supported by UNDP, GEF and IUCN. The project covered three nature reserves (Al-Shouf nature reserves, Ehden nature reserve, and the Palm Island nature reserve) and aimed at “the safeguard of endemic and endangered flora and fauna species by protecting their habitats, and incorporating conservation into sustainable human development” (MOE 1995, 1; UNDP 1995). The project proposed and adopted a vertical management model “to promote both long-term ecological and short-term economic objectives of wildlife conservation and sustainable use of natural resources” (Talhouk et.al, 2006, p 110, Bachir 2005). This model operates on the basis of Law 130/2019¹⁰ “The protected areas framework law” and involves three entities in the management process: (1) the Ministry of Environment, (2) an Appointed Protected Areas Committee (APAC), and the Management Team (MT) (Figure 4). The roles are distributed as follows:

- i. The Ministry of Environment – The Department of Ecosystem; is in charge of overseeing and guiding the projects. It develops the policies, regulations, and governance structure of nature reserves and nature sites under the MoE’s protection (Karam et.al, 2019). It holds central authority and decision making

¹⁰ Protected Areas Law No.130 of 2019 <http://extwprlegs1.fao.org/docs/pdf/leb192741.pdf>

- power through the approval of management plans, annual work plans, contracts with Management Team (MT), as well as main activities on site.
- ii. An Appointed Protected Areas Committee (APAC): comprises volunteer representatives from ministries, municipalities, NGOs, environmental advisors. The committee reports annually the management process to the MoE, and supervises the implementation of yearly management and financial plans by the Management Team. Annual reports on management development must be presented to the MoE.
 - iii. The Management Team (MT) implements the management plans under the supervision of APAC.

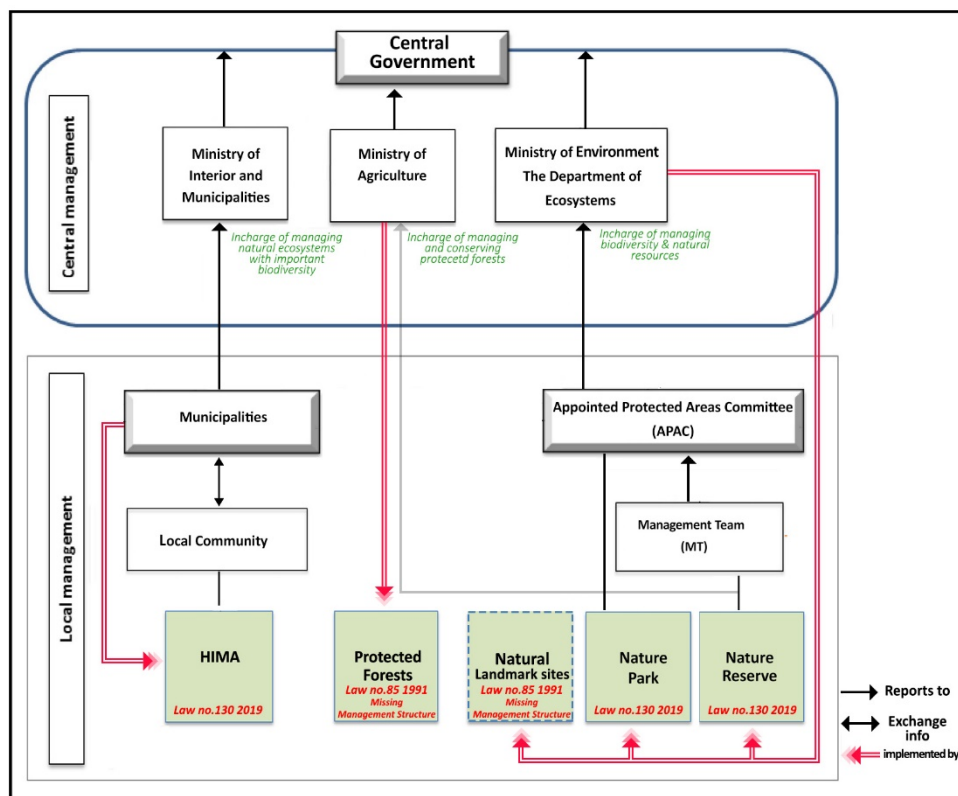


Figure 4: The management System of Protected Areas in Lebanon

Source: Created by Azzam 2022 based on Law 130.

In sum, the management system of protected areas in Lebanon operates in a highly centralized manner and reveals overlapping jurisdictions between three different central agencies (MoE, MoA, and MoIM) resulting in management inefficiencies. Regulations, laws, and policies cover many aspects of environmental management, but their enforcement is at best fragmented, and at worst absent. Although this management structure tries to decentralize management decisions and implement a collaborative approach to managing nature reserves, insufficient power and resources are provided to decentralized authorities (namely to municipalities and to APAC). Moreover, the management system does not include effective means of communication and the division of responsibilities between the reserves' management units is opaque. The lack of a legal status for APAC, and of secured funding mechanisms to the management team negatively impacted the implementation of effective means of decentralization which made the management process less effective (Figure 4). Add to this, the absence or lack of use of relevant spatial planning tools and modalities (such as regional planning, strategic planning, land use planning, land subdivision/grouping, expropriation...) prevent the proper implementation of zoning and territorial demarcation that are essential to effective BR management.

In addition, the actual participation of local communities in the management system is dismissed, which means their input is excluded from elaboration and the implementation of collaborative management practices and management plans. According to Lara Samaha, the Head of the Department of Ecosystems at the ministry of Environment, the MoE's regulations related to establishing a protected

area along with the updated law 130/2019 do not involve rural communities in any phase of the protected area allocation or management process of protected areas.

Furthermore, according to Talhouk (2006), the development of management plans is generic, revealing a significant absence of strategic planning, impactful activities, and effective administrative structure.

C. Al-Shouf Cedars: From Nature Reserve to Biosphere Reserve

1. The Making of Al-Shouf Nature Reserve

In 1992, with the convening of the United Nations Conference on Environment and Development, also known as the Rio Earth Summit, along with the Convention of Biological Diversity (CBD), the conservation paradigm took a new turn. Various organizations were formed through international efforts to support the conservation of biodiversity, such as the Global Environmental Facility (GEF). The GEF's role, as the financial mechanism of the CBD, is to help developing countries and economies in transition to accomplish the CBD's objectives by supporting the establishment of nature reserves.

As mentioned above, the *Society for the Protection of Nature in Lebanon* (SPNL) is an ENGO with strong international relations through its membership in the World Conservation Union (IUCN), and its partnership with BirdLife International. In 1993, Assad Serhal, the general director of SPNL and head of the Lebanese Environmental Forum (LEF) at the time, proposed, during a meeting with the IUCN in Jordan, funding three conservation areas with rich and unique biodiversity in Lebanon, namely the Palm Islands, Horsh Ehden, and Arz Al Shouf. The project was known as the GEF-funded Protected Areas Project (PAP). "Getting

the funds was an extremely competitive process for us along with securing the required five conditions: (i) land tenure, as the requirement was for biodiversity sites to be declared on public lands, (ii) international recognition of the sites, (iii) legally protection of biodiversity areas, (iv) a commitment to prevent hunting for five years, and (v) community participation in project management”¹¹. Among these three nature reserves, Al-Shouf Cedar area was firstly given international recognition as IBAs¹² by 1994, followed by the Palm Islands in 2009.

The making of al-Shouf Cedar nature reserve demanded considerable political negotiations which Serhal led. He outreached to the political patron of the Shouf region, Walid Joumblatt, who was a fervent protector of the natural environment and who also saw that the biosphere was a convenient tool to protect his power over his territorial stronghold, in what Bou Akar describes a logic of “the war yet to come” (Bou Akar 2011). Serhal helped established the NGO “Al-Shouf Cedar Society” (ACS) and Project-Law No.532¹³ was proposed, under which the Shouf reserve was established. Jumblatt headed the ACS whose members were all either members of his parliamentary bloc or environmental activists allied to him. Still today, the ACS committee includes Joumblatt as president, his close allies Akram Chehayeb as vice president, Charles Noujaim, a lawyer politically allied with him, as treasurer, Michel Skaff, a politician allied with Jumblatt, and his wife Nora as advisor with other three members of his party.¹⁴

¹¹ Interview with A.Serhal 16/11/2021,Beirut

¹² An Important Bird and Biodiversity Area (IBA) is an area identified using an internationally agreed set of criteria as being globally important for the conservation of bird populations.

¹³ Law No. 532 of 24/07/1996 Establishing a Natural Protected Area “Al Shouf Cedar”
<http://extwprlegs1.fao.org/docs/pdf/leb155306E.pdf>

¹⁴ Unlike Horch Ehden, the making of the Shouf nature reserve saw no political competition. In Zghorta, Maronite patron and Marada Movement leader Suleiman Franjeh attempted to control the NGO friends of Horsh Ehden (Solberg 2014). The reserve witnessed a struggle between Franjeh and the Mouawad Clan for power over its developmental funds, thereby hampering the reserve’s daily management. However, “when GEF’s 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. As such, the mayor of Ehden was assigned as head of the newly established NGO to facilitate a flow between the reserve and the municipality of Ehden

Lawyer Georges Nehme, also a close ally of Jumblatt, drafted project-law no.532 for the reserve which was proposed to Parliament by the Jumblatt coalition of 10 MPs, and issued on 24 July 1996 to declare that the communal lands (*mushaa*) of 9 villages¹⁵ in addition to the government owned lands (*amiri*) in the Eastern side of Barouk Mountain will be a Nature Reserve. Among the stipulations, the 5th article in Law 532 mentioned that wild hunting is prevented in the area or within a distance less than 500 meters of its border.

Although the 11th article in Law 532 mentioned that an Appointed Protected Areas Committee (APAC) had to be established for three years, and that the committee board was to be approved by state representatives, the appointment was blocked, allegedly by Jumblatt and ACS managed the area instead (Kingston, 2001, p63). Later, to abide by the BRs' legal requirements, the APAC was established but all its members were Jumblatt's direct allies (Solberg, 2014).

Thus, in 1996, the MoE appointed Assad Serhal to be the Reserve's first manager (1996-2002), under the Protected Areas Project (PAP). Local communities were only partially included in the management of the reserve. According to Talhouk et. al (2006), they were merely hired as rangers or contracted to provide basic services such as hut building and the maintenance of pathways. Some received technical support in education and awareness. Indeed, Serhal trained and managed a Reserve Team of 13 rangers, guides, scientific and awareness officers.

and supervise on the management responsibilities" as cited in Rhea Ekmekji thesis. See Rhea Farid Antoine Krikor Ekmekji, *A Comparative Study of a Protected Area and A Biosphere Reserve in Lebanon* (M.S. Thesis, American University of Beirut, 2021), 32- 33.

¹⁵ Niha, Jbeih, Mreste, Khraibe, Maaser, Barouk, Bmohreh, Ain Dara, and Ain Zhalta

Additionally, the Reserve's establishment was contested, and the progress of the PAP got interrupted by conflicts with local communities and the application of strict conservation practices. People living around Al-Shouf nature reserve were quite dependent on the reserve resources for their livelihoods. "Residents expressed skepticism to outright hostility as lands became appropriated into a protective regime under Jumblatt's auspices" (Solberg, 2014, p 274). The establishment of the nature reserves reduced the land available to them and severely limited their sources of subsistence and economic activities. For instance, people who owned private lands and rented public lands for agro-pastoral activities were totally prevented to continue by the management team. Today, people still resorted to illegal quarrying, hunting, logging and uncontrolled grazing.

Financially, the reserve suffered from limited funds for management. International funds allocated to nature reserves were mainly channeled to the state agencies while the reserve's direct revenues were dependent on the donation fees collected at the entrance, which were very scarce.

In 2002, after the end of Serhal's mandate, Fouad Mahmoud, who was previously a colonel in the Lebanese army and a member of the Progressive Socialist Party (PSP) was assigned to manage the reserve. Between 2000 and 2010, Nizar Al Hani, an environmentalist, also affiliated to the PSP, became the Scientific Coordinator of the SBR. In 2002, Al-Hani participated in UNESCO'S general conference, where he said to have "recognized the importance of enhancing the relationship between people and their environment and decided to adopt and implement this concept in Lebanon." In 2005, Al Hani in collaboration with Ghassan Jaradi, the president of Palm Islands Reserve and a member of the

International MAB-UNESCO Advisory Committee and the Secretary General of National MAB Committee in Lebanon, submitted the Shouf lands for the registration of the reserve as a biosphere reserve with the consultation of professors and experts, who knew how to write the proposal. Following this, inspectors from UNESCO visited the reserve to assess the region and to check its alignment to the proposal submitted in order to give approval. In 2005, the Shouf Biosphere Reserve, “including the Shouf National Reserve, Ammiq wetlands and twenty-two villages surrounding Niha and Barouk Mountains (SCR, 2020), were designated as a UNESCO Biosphere Reserve through the MAB-program “with an area of approximately 50,000 hectares or 5% of the total area of Lebanon” (SCR, 2020). SBR became involved in three primary agendas: conservation, sustainable development, logistic support for scientific research and education.

In 2012, Jumblatt recommended and supported Al-Hani’s access to the presidency of the reserve. Since, Nizar Al-Hani has been managing the reserve, leading a team of 13 members. In many ways, the story of the making of the SBR reveals a remarkable story bringing together conservationists and environmentalists who were keen on finding legal and institutional ways to protect the forests and rich natural resources of Shouf and managed to find the right political backup to do so. These activists had to face dire challenges to reach their aims and managed to do so under much duress. Along the way, they realized they lacked much institutional, regulatory and financial support to implement effectively the management of the BR as we will see in what follows, namely with regard to their interactions with the community. Indeed, the lack of effective decentralization, regional and local

governance and planning did not contribute positively to the management of BRs, as the SBR case-study demonstrates.

2. Characteristics of the Shouf Biosphere Reserve

The SBR is located at an altitude ranging from 1100-2000m., and along the Barouk mountain range, which is the southern extension of the Mount Lebanon Range. The SBR accounts for a quarter of the remaining cedar forests of Lebanon, which have a variety of mixed trees that are more than 2000 years old (MOE & LU 2004; SCR 2020), and boasts a variety of different species¹⁶.

The SBR's landscape consists of a patchwork of agricultural land, semi natural woodlands and pastures, and agroforestry. In the land-use map, agriculture has the highest percentage of coverage (30%), of which 19.4% is currently abandoned, due to the migration of large parts of the population during and after the war (Corrieri, 2021). Consequently, many old agricultural terraces collapsed and many lands are on the onset of erosion causing the loss of fertile soil and the increase of runoff (Corrieri, 2021).

The SBR is divided to three interrelated zones as follows:

i. Core Zone:

“The SNR is the core zone (161 Km²) of the Shouf Biosphere Reserve” (SCR, 2020). The main conservation objectives of this zone are the protection and rehabilitation of the SBR's cultural and natural values (SCR, 2020). The SNR's

¹⁶ An estimated 552 species of plants, trees shrubs, grasses, and endemic herbs. Many of these plants are medicinal, some are edible, and others are aromatic. The reserve is one of the last remaining areas in Lebanon where large mammals that once roamed the region can still be found. It is also a home to 30 species of medium sized mammals. Nevertheless, a substantial number of bird species use the reserve and Ammiq area as a resting area during annual migrations.

protected areas include three separate cedar forests¹⁷ situated on the upper elevations of the reserve and on private lands. A secondary core zone is found on the Niha Mountain (MoE & LU 2004b; SCR 2009). Activities that are prohibited in the core zone are: hunting, grazing, tree cutting, new asphalt roads, buildings and facilities, unlimited or guided tourism, pollution/garbage of all kinds.

ii. Buffer Zone

“The buffer zone (54 km²) of the SBR surrounds the core zones where only activities compatible with the conservation objectives can be implemented” (SCR, 2020). The role of the buffer zone is to minimize external and negative effects from human-induced activities on the core zones. Buffer zones¹⁸ have an important connectivity function in a larger spatial context because they connect biodiversity components within core zones with those in transition zones (Abu-Izzeddin, 2012). The SBR’s buffer zone consists of municipal lands incorporated into the Al-Shouf Cedar Reserve (Law 532), and private lands. Around 70,000 people living in core in the buffer zone. Prohibited activities are: major construction and industrial activities, uncontrolled grazing, hunting and tree cutting pollution/garbage of all kinds.

iii. Transition Zone (Development Zone):

¹⁷ Maasir Shouf, Barouk, and Ain Zhalta-Bmohray

¹⁸ Law No. 532 of 24 July 1996 designates a buffer zone of 500 meters directly surrounding the core zone where no tree cutting, uncontrolled grazing, major construction, quarrying, burning or hunting are allowed.

“The outer transition zone (233 Km²) of the Shouf Biosphere Reserve includes all the villages¹⁹ surrounding the Biosphere where sustainable resource management practices are promoted” (SCR, 2020). The transition zone performs an important central function in the socio-economic development of the region. The establishment of the SBR has given a powerful impetus to twenty two municipalities in the Shouf and West Bekaa regions to take advantage of the natural resources of the region, to attract tourism, and to increase the income of local communities. The Transition Zone consists mostly of private lands, municipal lands, and religious waqf. The total population residing in the transition zone is about 116,000 inhabitants (SCR, 2020). Prohibited activities are activities that contribute to climate change and pollution/garbage of all kinds.

The twenty-two villages in the SBR benefit from their designation through a set of services and projects including agriculture, tourism, rehabilitation of agricultural terraces, and the sale of local artisanal and food products. An assessment of the SBR ecosystem services highlighted an average annual economic value of US\$ 19 million for monetized services and “concluded that each investment of US\$ 1 in the reserve would return US\$ 19 worth of public benefits,” Al Hani clarifies. In 2004, 28,000 people visited SBR (SCR, 2020). After the 2006 war, the number dropped to 14,072 visitors in 2007, but increased to 40,000 visitors in 2010, of whom 65% Lebanese and 35% foreigners (Matar, 2009). Since, 2010, visitors’ numbers have shown a steady increase through six entrances: entrance of Ain Zhalta-Bmohray Cedar Forest,

¹⁹ Niha, Jbaa, Mrousti, El Khraibe, Maasser el Chouf, Batloun, Barouk, Ain Zhalta and Bmohray, El Mdairej, Dahr El Baidar, Qab Elias, Ammiq, Aana, Kefraya, Kherbit Kanafar, Ain Zebde, Saghbine, Deir Ain El Jaouze, Bab Mareaa, Aitanit and Machghar

entrance of Barouk Cedar Forest, entrance of Maaser Cedar Forest, Niha fort entrance, Jbaa entrance, and Mrusti entrance ([Bathish](#), 2017) (Figure 5).

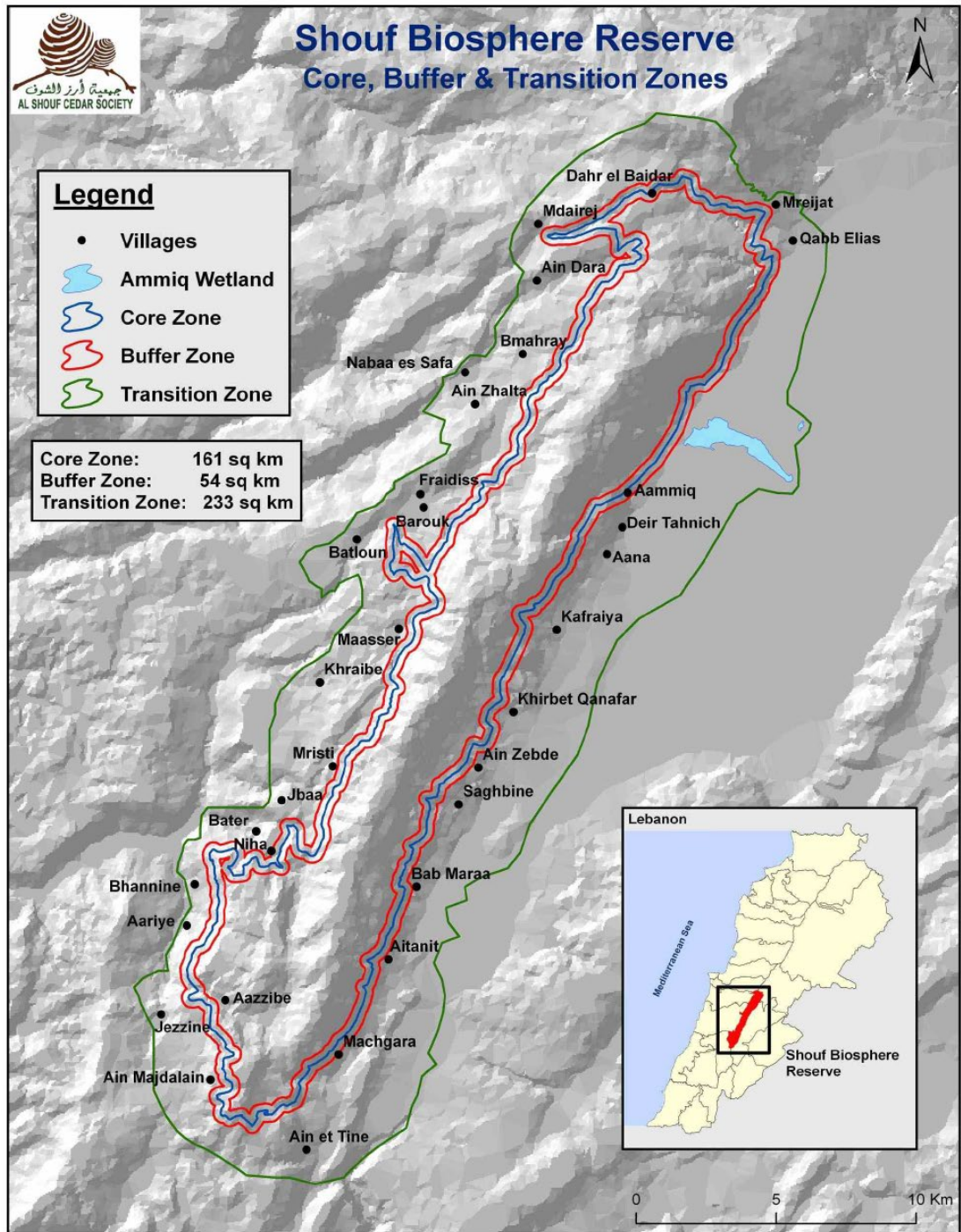


Figure 5: Shouf Biosphere Reserve Zones

Source: Shouf Biosphere Reserve Website

Recently, the SBR has been paying special attention to ecotourism and introduced several activities to encourage the internal tourism sector and attract more foreigners. For example, more than 250 km of hiking trails connected the villages of the SBR, extending from the highest mountain peaks to the lowest riverbeds. The focus was on raising environmental awareness activities on nature and biodiversity. In 2017, the reserve registered 105,000 visitors compared to 87,000 in 2016 ([Bathish, 2017](#)).

3. SBR Management Structure

Internationally, the governance and management structure of biosphere reserves is set and established by UNESCO and the MAB. BR management is dependent not only on the reserve's on-site active members, but also on how the stakeholders and the team communicate and interact with international stakeholders around their legislations and international frameworks (Berkes, 2007). As such, the MAB has established different sectors who work together to be able to establish, manage and monitor biosphere reserves on the long-term. The International Coordinating Council (ICC) is the first team established by the MAB and 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 is also advised by the ACBR. The main task of the ACBR is to examine proposals for biosphere reserves as well as advising and proposing amendments which can help improve the biosphere reserve operations (Schliep & Stoll-Kleeman, 2009).

The ICC and ACBR share together the plan and proposal set for the BR with the MAB secretariat which then submits the information to the World network of Biosphere reserves. The ICC shares later the information with the supra-national networks (10 in

total including: ArabMAB, EuroMAB etc.) who exchange information with the MAB national committees (the Lebanese Committee in the case of Lebanon), 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 6).

In 1997, the ArabMAB was launched to promote co-operation between Arab National MAB Committees in order to strengthen the MAB programme in the Arab Region, including through the establishment of biosphere reserves and the implementation of common research and public awareness projects. ArabMAB represents 14 Arab countries.²⁰

Nationally, through the Lebanese Committee of Man and Biosphere (LebMAB), Lebanon is present and active as part of ArabMAB. The LebMAB committee includes five members: Georges *Tohmé*, as president, Ghassan Jaradi, as a secretary, and one representative for each BR (Chouf, Rihane, and Jabal Moussa). This committee reports directly to the office of the Lebanese Prime Minister, but since 2016, it has limited activity.

Lebanon lacks a specific legislation related to BRs. They are only protected to the extent of existing national legislation that any protected area in Lebanon follows and a management structure which was set according to the PAP in 1996. As discussed, locally, the Reserve is managed by an Appointed Protected Area Committee (APAC) and the Management Team (MT). For al-Shouf, this is done in cooperation with the Al-Shouf Cedar Society (ACS) and under the provision of the Ministry of Environment

²⁰ Algeria, Egypt, Jordan, Lebanon, Libya, Mauritania, Morocco, Qatar, Saudi Arabia, Sudan, Syrian Area Republic, Tunisia, United Arab Emirates, Yemen.

(Fig.4). The SBR’s APAC includes twelve members (mayors of the larger villages and politicians who are affiliated to Joumblatt). Four out of them are found among the Al-Shouf Cedar Society (ACS). Currently, the APAC “supervises the work of the Management Team (MT) and ensures the proper implementation of the management plan and the budget, and reports regularly to the MOE” (Abu-Izzeddine, 2012, p.25). However, actually, the ACS is the actor responsible for decision-making and achieving the objectives of the management of the site. ACS directly works and collaborates with municipalities management team, and stakeholders to ensure the proper implementation of the management plan and eco-tourism projects.

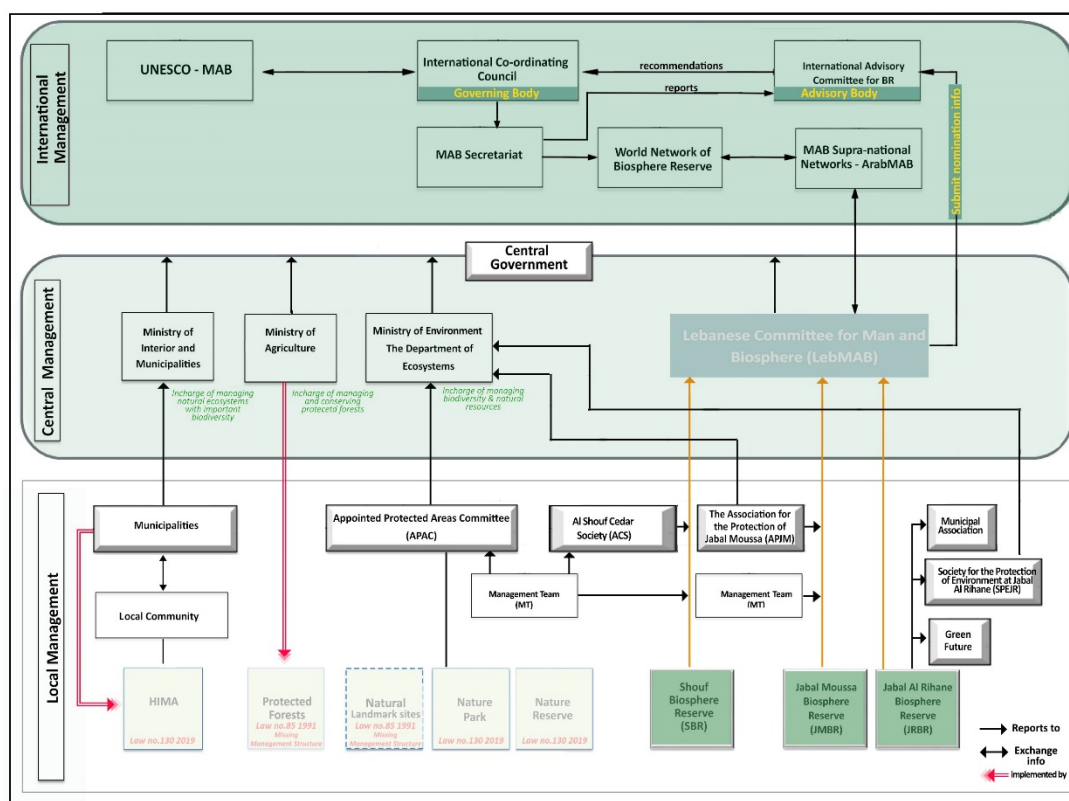


Figure 6: Management and Governance structure of SBR on International, central, and local Level

Source: Azzam 2022

The Management Team includes Nizar Al-Hani, the manager of SBR, an administrative assistant, rangers, an awareness coordinator, eco-guides, a scientific coordinator, and a local development coordinator. The *Administrative Assistant's* mission is to perform all aspects of data entry, every day secretarial work, and deal with accounting and payment operations. The *ranger's* task is the operational management of site, and for authorized agents the enforcement of the laws protecting nature. The *Awareness Coordinator* mission is to design and implement public awareness and sensitization projects aimed at exploring and conserving the rich heritage of the reserve. The *Eco-guide's* mission is to lead the guided visits of the site. The *Scientific Coordinator's* mission is to organize and guide scientific activities and projects in the reserve. The *Local Development Coordinator* mission is to contribute to the integration of the reserve into the local and regional socio-economic context.

In addition to the MoE, other government agencies have roles and responsibilities within the reserve's territories. For instance, the Ministry of Public Works is responsible for the Kefraya-Maasser Shouf road which passes through the SBR, the Department of Antiquities has jurisdiction over the antiquities and ancient ruins, the Ministry of Information and the Maasser Municipality have authority over the T.V. transmitters in the SBR, and the Barouk Water Office has authority over water rights, especially the Barouk water, in the Shouf area.

The reserve includes five departments: Research and Monitoring, Environmental Awareness, Ecotourism, Rural development, and Project Management. Each department develops projects and activities which are implemented by the Management Team (MT) in collaboration with stakeholders who assist the team with

financial and technical support. The SBR's MT consists of 13 members who are predominantly Druze and aligned onto the PSP.

Since 2012, the ACS has been implementing the forest and landscape restoration plan (FLR), with the financial support and technical guidance of international organizations MAVA Foundation, UNDP, and FAO. For the FLR, the ACS established a decentralized participatory governance mechanism for planning, implementing and monitoring. This mechanism included the creation of three committees formed of local, national and international stakeholders²¹, municipalities, aimed at gathering around a common vision with multiple objectives to enable implementation. Local stakeholders such as NGOs and local community were trained on activities such as forest biomass management, dry stone wall terraces restoration, apiculture, and aromatic plant cultivation. However, some landowners and citizens did not participate because they sensed risks to their interests. ACS signed collaboration protocols with four municipalities (Barouk, Maaser, Mrusti and Aitanit) for the development of municipal forest restoration plans and interventions.

Nizar Al Hani said that this project "is more than just planting trees – it is restoring a whole landscape to meet present and future needs and to offer multiple benefits and land uses over time, aiming at restoring cultural practices and developing new methods to improve the use of local raw materials in a sustainable way." This led to the production of briquettes which were distributed to local communities for heating, providing an increasingly valued alternative to firewood and diesel—the main

²¹ Local stakeholders involved in FLR planning and implementation in the SBR landscape are: Deir el Kamar Forestry branch-offices, Ministry of Agriculture, Local NGOs: Green Orient, Friends of Green Environment, and Lebanese Home for Environment, Public and private schools and education associations. National stakeholders: Ministry of Environment; Ministry of Agriculture, American University of Beirut; Lebanese University, SPNL, the Lebanon Mountain Trail Association. International Stakeholders are: IUCN Centre for Mediterranean Cooperation, Italian NGOs: LIPU/BirdLife Italy and the Istituto OIKOS; Italian company ILEX, International experts on FLR, mainly from Spain, Private companies: Middle East Airlines, Byblos Bank, Porches Club Lebanon, Khalil Fatal and Sons, Advanced cars, Lycee National Schools, Four Seasons Hotel, HSBC Bank, Patchi, Nestle

energy sources in most household. However, the production of these briquettes were distributed to 30 houses in each of the 9 villages, and excluded twelve villages, which provoked tensions.

4. Challenges and Status of the SBR's Management and Planning Scheme:

Existing legislations, policies and regulations for environmental protection remain inadequate to support the SBR and sustainable development practices. In addition, the lack of sufficient enforcement mechanisms within the reserve's borders prevents the effective control of illegal actions. As such, biosphere's territories remain subjected to violations of illegal quarrying, hunting, uncontrolled grazing and fires. Generally, local authorities treat the BR operational management system as a protected area and there is no effective environmental management practice. Members of the local community, such as agro-industrial enterprises, private land owners, providers of tourism services (e.g. restaurant and hotel owners), educational associations, women and youth groups are not represented in the Reserve's governance structure, neither in the APAC or the ACS.

Additionally, the spatial planning of the SBR is lacking and can be much improved. The management team lacks knowledge on land use planning and on landscape ecological management, which has negative impacts on the reserve. Additionally, there is no control over constructions that are invading the buffer zone. Moreover, since 2005, the delineation of the SBR boundaries and clarification of land tenure and land use in the core and buffer zones are pending. For UNESCO, the International Union of Conservation of Nature (IUCN), and the Convention on

Biological Diversity (CBD), reserves' core and buffer zones require demarcation of boundaries.

Nizar Al Hani agrees that “demarcation is the basis of effective management of protected areas: without clear boundaries and an organized buffer zone, we cannot practice conservation and engage local communities; it also has an important connectivity function in a larger spatial context because it links and balances biodiversity components between the three zones of the SBR”. Initially, the demarcation process of SBR boundaries was commissioned by the reserve's authority to Bashar Abdel-Samad, an urban planner, who was also tasked to develop detailed urban plans (UPs) for nine villages located within the Shouf district. Abdel-Samad proposed delineating the buffer zone by making 500m offset from the core zone. However, according to urban planner Serge Yazigi, this approach was rejected by municipalities and local communities because the offset of 500m from the core zone touched the core or central squares of their villages. Moreover, the demarcation was implemented in a context marred by lack of data on land cover, tenure and land use which created a lot of confusion: “some of the villages are still not surveyed and the coordination between municipalities and the management authority have been largely ignored,” Yazigi said.

Hence, the unclear delimitation of land tenure, together with the absence of land use planning resulted in uncontrolled urbanization and mining activities in the buffer and core zones of the SBR. Furthermore, the abandonment of the customary governance systems that regulated the management of natural resources in communal and public lands led to conflicts among land users and the overexploitation of the natural ecosystems.

Currently, the demarcation process of buffer and core has been commissioned to five new experts in landuse, topography, environment, GIS, and legal studies. This time, the demarcation process is based on the following principles: (i) conserving the core zone's integrity; (ii) reducing the number of privately owned lands from the SBR zones by excluding them from the perimeter; (iii) public good supersedes private interests; (iv) the interests of small land-owners are prioritized over those of large land-owners and developers; (v) developing an action plan to deal with unclear issues; (vi) detailed urban plans serve as the foundation for land-use planning and zoning in unplanned areas.

In addition to that, the lack of sustainable funding in the SBR remains one of the most significant problems of effective management. The management of SBR is mainly funded by the MoF through MoE. In turn, the MoE funds the reserve through the APAC. Nizar Al Hani reported that until today, “the reserve did not receive the annual budget for year 2021”²². Thus, the reserve currently depends on direct revenues from entrance and through the selling of local products at the reserve's four entrances, and financial support from Walid Joumblatt.

Interviews conducted with stakeholders provided me with all the data synthesized above that helped me to undertake a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of the SBR. Strengths and opportunities were mainly related to the successful biodiversity and natural conservation policies of the reserve which secured its unique geological features, its ecological and cultural values, and its ability to develop eco-tourism activities and facilities. Weaknesses and threats relate to the administrative management and spatial planning modalities:

²² Interview with Nizar Al Hani 19/10/2021,Beirut

namely to the lack of guidelines clearly defining roles and responsibilities and relations between management actors, to the exclusion of the local community from the management process, to limitations in terms of financial and human resources, to hindered zoning demarcation process, to illegal activities such as fire risks and cutting trees), as well as to constraints related to the economic crisis.

Table 2: SWOT Analysis of the Souf Biosphere Reserve

Source: Azzam 2022

SWOT			
Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> ▪ International certifications: UNESCO Biosphere Reserve Global Important Bird Area; IUCN. ▪ Rich biodiversity: endemic flora species of international importance. ▪ Unique geological features. ▪ A rich archaeology, of rarity in high mountains, with diverse heritage sites and finds since the Paleolithic. ▪ Diversity of trails and wild landscapes. ▪ Engagement of locals in the tourism value chain (guides; guards; and guest-houses) ▪ Products marketed under a registered trademark. ▪ Existence of a well maintained tourism infrastructure. ▪ A destination for all seasons. 	<ul style="list-style-type: none"> ▪ Weak and Inadequate management structure ▪ Insufficient administrative, financial and human resources ▪ Lack of guidelines clearly defining roles, responsibilities and relations between all management actors ▪ Unclear boundary demarcation of zones resulting in conflict with private landowners ▪ Exclusion of local communities ▪ Previous and current risk of damaging the ecosystem and looting of cultural sites. ▪ Limited number of local eco-friendly cultural initiatives ▪ Limited number of direct beneficiaries of the ecotourism and agro-food initiatives ▪ Lack of international cooperation 	<ul style="list-style-type: none"> ▪ Growing interest of tour operators both nationally and internationally. ▪ Growing interest in ecotourism, eco-friendly crafts, and all-natural dried fruits and nuts. ▪ Interest in tourism paths on regional level (Union of Municipalities). ▪ Themed festivals and events with the potential of attracting thousands of visitors. 	<ul style="list-style-type: none"> ▪ Economic situation collapse of Lebanon ▪ The entanglement of actors managing the biosphere ▪ Poor mobility connections ▪ Urbanization/sprawl ▪ Violations: Illegal quarrying; hunting; logging; uncontrolled grazing ▪ High fire risks and climate threats ▪ Lack of governmental support

In conclusion, the post-war reconstruction phase has prioritized urbanization and shifted national priorities away from environmental and biodiversity protection, jeopardizing wildlife and increasing pollution, alongside the exacerbation of an unsustainable exploitation of natural resources. Amidst these harmful environmental

policies and practices, the Ministry of Environment managed to legislate the implementation of natural reserves and to implement some biodiversity conservation practices. However, it was granted an advisory rather than an executive function or role in the government; this consequently limited and minimized its impact at the level of public policymaking and decisions. As such, the lack of enforcement of nature reserves by MoE is related to such aspects such as insufficiency of public funding, overlapping duties and responsibilities with other ministries, deficiency in human and technical capacity.

The management system of protected areas in Lebanon operates in a highly centralized manner, excludes local community and is decoupled from regional planning tools. Strategies, management plans and budgets for Lebanon's protected areas all require strengthening and additional assistance. Lebanon lacks a specific legislation related to BRs. They are only protected to the extent of existing national legislation that any protected area in Lebanon follows and follow a management structure which was set according to the PAP in 1996. Existing legislations, policies and regulations for environmental protection remain inadequate to support the SBR and sustainable development practices. In addition, the lack of sufficient enforcement mechanisms within the reserve's borders prevents the effective control of illegal actions. As such, biosphere's territories remain subjected to violations of illegal quarrying, hunting, uncontrolled grazing and fires. Generally, the SBR management system operates relatively effectively as far as natural conservation is concerned, but is less effective when it comes to decentralized regional and local governance and spatial planning management.

CHAPTER IV

EVALUATING THE SHOUF BIOSPHERE RESERVE (SBR), WITH A FOCUS ON SPATIAL PLANNING

In order to explore the extent to which the BR concept and its effective management from a planning perspective are effectively conceived and implemented in the Shouf Biosphere Reserve, this chapter evaluates the current status of the reserve based on the evaluation framework I discussed in Ch.2 and the SWOT analysis I shared in the previous chapter. As explained earlier, the framework adopts the Protected Areas Management Effectiveness (PAME)/Matar's evaluation framework for Biosphere Reserves.

The PAME model was developed by Marc Hockings in 2006, and updated by Matar in 2015. It is based on three main rubrics: (i) Design and planning, (ii) Adequacy and appropriateness of management systems and processes, and (iii) Delivery of protected area objectives. These three rubrics assess six complementary elements: Context and planning in rubric (i), Inputs and processes in rubric (ii), and Outputs and outcomes in rubric (iii), for evaluating management. I added two additional rubrics to this framework: first, using Van Cuong et al. (2016) on matters related to participation, delivery, and designation particularly regarding regional integration and economic development indicators; and second, using Stern and Montz (2012) on matters related to spatial planning and territoriality. Particularly, I integrated three indicators: a masterplan prioritizing conservation and regulating development, a map identifying the cultural and landscape landmarks, and subsidiary plans.

As such, the final evaluation framework I elaborated groups a total of 81 headline indicators (A.1, A.2 etc.) and 81 sub-indicators: 56 from the initial PAME and Matar model, and 25 new ones.

I then propose a set of evaluation criteria that assesses each indicator on a scale of 1 to 5, 1 being the lowest. In what follows, I present the framework evaluating the SBR, proposing a quantitative assessment which can help identify the main constrains that hinder the reserve's effective planning management system. This quantitative assessment is indicative and based on the review of documents I have compiled about the SBR. It lacks a systematic approach as it was done during the pandemic, during which I did not have access to many resources.

A. Evaluating the Shouf Biosphere Reserve, with a Focus on Spatial Planning:

Design/Planning		
A. Context		
A.1	<i>Scoring</i>	Level of Significance
A.1.1	4	Key ecological values are identified and prioritized
A.1.2	4	Key socio-cultural values have been identified and prioritized
A.1.3	1	Potential for sustainable development is identified and prioritized
A.1.4	4	Site value for environmental research, monitoring and education is identified
A.2		Extent and severity of threats
A.2.1	3	Threats to nominated values are identified and severity evaluated
A.3		Constraint or support by political and/or civil environment
A.3.1	4	Political contexts are favorable to management success
A.3.2	1	National authorities and leaders are supportive
A.3.3	2	Local community and civil society is supportive
A.4		Environmental Legislation and National Policy Framework
A.4.1	1	National protected area legislation is inclusive of BRs
A.4.2	1	BRs are integrated in the national strategies, development plans and laws
A.5		Regional Integration
A.5.1	1	Availability of a regional spatial plan
A.5.2	1	BR is related to or addressed specifically in regional spatial plan
A.5.3	2	BR plans promote the development of regional economy
Total	29/65	

Under Design and planning (Rubric 1), the evaluation starts with scoring indicators under two elements: *(A)* the site's *context* within which the SBR is operating, and *(B)* the site's *planning* in relation to the reserve's legislations, zones, and tenure issues.

For *(A) context*, five sets of indicators are assessed: level of significance (A.1), extent and severity of threats (A.2), constraint or support by political or civil environment (A.3), environmental legislation and national policy framework (A.4), and regional integration (A.5), for a total of 13 indicators. For level of significance (A.1), I gave scores close to 4, with one low number, as the key ecological and socio-cultural values of SBR have been identified and prioritized by the management team. Additionally, the understanding of the sustainable development concept in SBR has been partially translated into practice through the revival of traditional land management practices, and implementation of programs such as local traditional food (Anthony and Matar, 2019). Site value for environmental research and education has been also identified and supported for ambassadors, researchers, and university students who are willing to gather data and/or conduct scientific research in the reserve. However, the reserve's management team (coordinators and field assistants) still lacks facilities, resources, and knowledge to conduct science-based research. For the extent and severity of threats (A.2), I gave (A.2.1) a score of 3 (weak) because threats to the ecological and cultural values in the SBR are weakly identified, and poorly prioritized in terms of mitigation. Indeed, they are only mentioned in applications for financial assistance or progress reports. Regarding the constraint or support by political or civil environment (A.3), SBR scores medium to high because the local community is divided between those who support the SBR and those who do not. It appears that this is a

generational rift, whereby older generations consider the reserve a threat to their livelihoods, land tenure and agricultural activities, whereas the new generations see it as a worthy opportunity to improve rural development and protect biodiversity. In addition to that, for environmental legislation and national policy framework (A.4) and regional integration (A.5), the scores were quite negative because neither the updated national protected area legislation nor the current national strategies, development plans, and laws account for Biosphere Reserves in Lebanon. The government of Lebanon lacks specific legislation related to SBR. As mentioned in the previous chapter, the MoE supports SBR only in terms of protected area law which existed and dated back to 1996. Additionally, to date, as mentioned in the introduction, regional spatial plans do not exist. Although there have been few attempts to integrate protected areas and natural important sites in a cross-sectoral, comprehensive and sustainable planning vision, they have never been implemented.

B. Planning		
B.1	<i>Scoring</i>	Main Planning Actors and Authorities
B.1.1	2	Effective land-use planning authorities
B.1.2	1	Land-use planning authorities account for BR
B.1.3	1	Effective decentralization regulations
B.1.4	2	Regional and local governments (municipalities/unions of municipalities) account for BR in their work
B.2		Tenure Issues
B.2.1	1	Land ownership status and related issues are well known
B.2.2	2	Issues of land tenure are accounted for in planning legislation
B.2.3	1	Land acquisition is adopted (i.e. purchasing or renting private lands)
B.3		Marking of Boundaries
B.3.1	2	Core Zone(s) boundaries are well delineated and defined (map/signage)
B.3.2	1	Buffer Zone(s) boundaries are well delineated and defined (map/signage)
B.3.3	2	The transition zone boundary is known
B.4		Appropriateness of design (for BR functions)
B.4.1	5	Size and zoning are appropriate and adequate to conservation, development and research
B.5		Management and Spatial Planning
B.5.1	2	The reserve is managed under one authority
B.5.2	2	A management plan for the BR site is developed and adequate
B.5.3	2	The review of the management plan is scheduled every 5 years

B.5.4	3	Adequate and appropriate planning processes are in place to enable effective management
B.5.5	1	Annual reports on the progress of management plan are available
B.5.6	1	A masterplan prioritizing conservation and regulating development is in place
B.5.7	2	A map of cultural and landscape landmarks and areas is available
B.5.8	2	Subsidiary plans are available (e.g. ecotourism, fire emergency)
B.5.9	4	Tools to manage impacts of planned projects and strategies on natural resources are developed and implemented
B.5.10	2	The reserve management/strategic plan follows the adaptive management process (measure, review, re-evaluate, and report)
B.5.11	3	Management targets specific to the site values are determined
B.5.12	1	Indicators to monitor progress towards set targets are developed
B.5.13	2	Periodic Review is submitted every 10 years
Total	47/120	

The second element in the evaluation framework is **(B) planning** and includes five sets of indicators: main planning actors and authorities (B.1), tenure issues (B.2), marking of boundaries (B.3), appropriateness of design (B.4), and management and spatial planning (B.5), for a total number of 24 indicators. Under the main planning actors and authorities (B.1), scores ranged between 1 and 2 because as discussed in Ch.1, land-use planning authorities in Lebanon do not account for SBR, they lack coordination modalities, mechanisms of public participation, and regulatory mechanisms for effective decentralization, accountability and political autonomy²³. For tenure issues (B.2) and marking of boundaries (B.3), indicators' scores varied between 1 and 2. As discussed in chapter three, the inter-governmental panel on the demarcation of public lands in the core zone was not activated to deal with the critical issues of demarcation and preparation of necessary deeds. As such, validity and location of

²³ Additionally, not all municipalities in the Shouf account for SBR in their work; for instance, the Minister of Interior and Municipalities, Nouhad Al- Machnouk, issued a decision (No.1252) granting the authority to the mayors in the governorates of Mount Lebanon, the North, Nabatiyeh, Baalbek-Hermel, Akkar and the South to issue building permits not exceeding 150 meters on top of an existing floor. Al-Machnouk justified his decision by the ministry's keenness to manage citizens' affairs and limit rural migration. As such, "this has increased the pace of construction in the buffer zone of the reserve and negatively impacted biodiversity since the decision did not exempt and account for the reserve," as Yazigi said in an interview. Also, in 2020, Muhammad Fahmy, the minister of Interior and Municipalities in Hassan Diab's government, re-issued the decision according to which it was allowed to grant building permits for 150 square meters without exempting the buffer zones of the protected areas.

private land claims, in buffer and transition zones, were not examined nor authenticated. Thus, boundaries were poorly marked resulting in conflict with private landowners. To date, an authorized map of the SBR does not exist. For appropriateness of design (B.4), indicator (B.4.1) which assesses the appropriateness of size and zoning to conservation, development, and research scored the highest among all the indicators. Indeed, the SBR is the largest BR in Lebanon and exhibits a variety of fauna and flora that deserve to be conserved and developed. Furthermore, regarding the management and spatial planning (B.5), scores varied between 1 and 4, with many 2s, because of (i) the entanglement of actors managing the reserve (MoE, APAC, ACS, and MT), and the lack of guidelines clearly defining roles, responsibilities and relations between all actors. The management plan of the SBR is reviewed every 5 years, and annual reports on its progress are available online on the reserve’s website. Monitoring/evaluation systems to assess SBR management effectiveness are not available. Periodic reports which were supposed to be submitted in 2015, were submitted in 2020. To date, the reserve lacks authorized maps, which prioritize conservation, indicating appropriate zoning systems for development, highlighting cultural and landscape landmarks, and fire emergency. However, the MoE have succeeded to propose and implement two tools that manage the impacts of planned projects and strategies on natural resources, namely the Environmental impact assessment (EIA), and the Strategic Environmental Assessment (SEA).

Adequacy/Appropriateness		
C. Input		
C.1	Scoring	Adequacy of Staff Numbers
C.1.1	3	Staff number is adequate for effective management of the BR
C.1.2	3	Staff is adequately allocated to reach management objectives
C.2		Adequacy of Current Funding Mechanisms
C.2.1	3	Funds necessary to reach set management objectives are available
C.2.2	3	Available funds are allocated based on management activities

C.3		Security and Reliability of Funding
C.3.1	2	Funds for the achievement of management objectives are secured
C.3.2	2	Sustainable financing mechanisms are in place
C.4		Adequacy of Infrastructure, equipment, and facilities for management
C.4.1	4	Appropriate equipment, vehicles and facilities are available
C.5		Adequacy of Relevant and Available Information for Management
C.5.1	2	Resources for monitoring set indicators and targets are available
C.5.2	3	Information needed to adequately manage the site is available
Total	25/44	

Moving to rubric (ii) of adequacy and appropriateness of management systems and processes, the evaluation continues with scoring indicators under two elements: *input (C)*, whereby the adequacy of resources in SBR is assessed, and where the management and planning *process (D)* of SBR is evaluated.

For **Input (C)**, the framework includes five sets of indicators: adequacy of staff numbers (C.1), adequacy of current funding mechanisms (C.2), security and reliability of funding (C.3), adequacy of infrastructure, equipment, and facilities for management (C.4), and adequacy of relevant and available information for management (C.5), for a total number of 9 indicators. For adequacy of staff numbers (C.1), funding mechanisms (C.2), and security and reliability of funding (C.3), scores ranged between 2 and 3 because the SBR has an insufficient core/permanent of staff, and limited funding resources for biodiversity and conservation work. For adequacy of infrastructure, equipment, and facilities for management (C.4), the score was high (4) in comparison to other indicators under this element because the reserve is provided by an adequate number of equipment and facilities for a variety of projects, thanks to the support of international stakeholders. The last indicator under the input element is adequacy of relevant and available information for management (C.5) and the score has varied

between 2 and 3 because the reserve lacks resources and information to adequately manage the site.

D. Process		
D.1	Scoring	Effectiveness of Governance and Leadership
D.1.1	3	Governance type of the BR is adequate
D.1.2	3	Governance system of the BR is free from corruption
D.1.3	4	Leadership is effective and adequate
D.2		Effectiveness of Administration Including Financial Management
D.2.1	3	Administrative and financial processes are adequate and effective
D.3		Adequacy of Staff Training
D.3.1	3	Training is adequately provided for staff based on needs
D.4		Staff /other Management Partners Skill Level
D.4.1	3	Expertise and skill level of staff and partners are adequate
D.4.2	2	Effective means of communication and division of responsibilities are used between the Reserve's units
D.4.3	2	Staff and the Reserve's departments are capable of enforcing policies and laws inside the reserve
D.4.4	3	Management policies and procedures are well-defined and applied by the management team
D.5		Involvement of Stakeholders and Communities
D.5.1	1	Availability of an advisory committee consisting of key stakeholder groups (e.g. tourism operators, experts, landowners, farmers, agriculturalists...)
D.5.2	1	Local communities are actively involved in the planning and decision-making process
D.5.3	1	Local communities are involved in drawing up the management plan
D.5.4	2	Local communities are involved in the implementation of the management plan and land management
D.5.5	1	Local communities participate in the regular management of the biosphere reserve (e.g. through institutionalized consultation mechanisms, such as permanent assembly or consultations on specific projects)
D.5.6	1	Availability of conflict resolution mechanisms (negotiation, mediation, arbitration, or adjudication)
D.6		Communication Program
D.6.1	4	An environmental awareness and education program is in place
D.7		Management effectiveness evaluation undertaken
D.7.1	1	Management effectiveness evaluation is undertaken
D.7.2	4	Staff meetings are used for adapting and learning
D.8		Appropriate program of community benefits/assistance
D.8.1	4	Community use of natural resources is identified
D.8.2	3	Projects and activities of direct community benefit are in place
D.9		Visitor Management
D.9.1	4	Ecotourism visitors are well catered for
D.9.2	3	Visitor's impacts on Reserve's natural and cultural assets are controlled and sanctioned
D.10		Natural Resource and Cultural Protection Activities Undertaken
D.10.1	3	Activities to conserve natural resources are implemented
D.10.2	3	Activities to protect cultural resources are implemented
D.11		Threat Monitoring
D.11.1	1	Major threats are monitored and report
Total	63/125	

The fourth element in the evaluation framework is **(D) process** and includes eleven sets of indicators: effectiveness of governance and leadership (D.1), effectiveness of administration including financial management (D.2), adequacy of staff training (D.3), staff /other management partners skill level (D.4), involvement of stakeholders and communities (D.5), communication program (D.6), management effectiveness evaluation undertaken (D.7), appropriate program of community benefits/assistance (D.8), visitor management (D.9), natural resource and cultural protection activities undertaken (D.10), and threat monitoring (D.11), for a total number of 24 indicators.

For effectiveness of governance and leadership (D.1), SBR scores weak to fair (3 to 4) because as identified in Ch.3, the governance structure is poorly defined and leadership is not as supportive as it can be. In addition, at the level of effectiveness of administration including financial management (D.2) adequacy of staff (D.3), training staff /other management partners' skill level (D.4), I assessed that the SBR performs very weakly (2 to 3 scores) because funds for administrative processes from MoE budgets are insufficient. As the government provides minimal and insufficient funding for Nature Reserves, the SBR relies mainly on project financing through international grants, as well as contributions from ecotourism visitors and rural products' sales, for financing its operations. Moreover, staff training and development programs are not provided at all. To date, the management team has not developed an action plan for biodiversity and ecosystem conservation due to the lack of expertise and know how. Some of management strategies have been defined but never implemented such as the

comprehensive forest fire fighting strategy which developed in 2010, but has never been implemented.

For involvement of stakeholders and communities (D.5), scores were quite negative (1 to 2) because the local community was never involved in any of the phases of planning, management, or decision-making processes except for the locals included in the management team. Stakeholders only partially participated in the regular management process of the reserve. The advisory committee consisting of key stakeholder groups that are supposed to oversee the drawing up or implementation of the management plan does not exist. For community program (D.6), I assessed that the SBR has a fair score because environmental awareness activities were provided to volunteers or students, schools, and universities surrounding the reserve, but in limited ways. At the level of education, the management team participates in worldwide campaigns, conferences and school visits to raise awareness among the younger generation. The Shouf management team has set up a website which helps people know more about the BR, the trails, research published and some historical evidence found in the reserve.²⁴

For management effectiveness evaluation undertaken (D.7), I assessed that the SBR has a one score for (D.7.1) because the management team has not implemented a monitoring or evaluation system to assess the effectiveness of reserve management. Staff meetings were only used for learning the basics of new principles to implement

²⁴ Recently, an awareness event about the water assessment study was introduced to SBR volunteers addressing different methods of surface water collection and the importance of underground water. “Moreover, around 1,280 students from public and private schools surrounding the reserve were introduced to the importance of biomass management in order to limit forest fires and preserve the traditional and environmental heritage of the area. Students visited the thinning site at Dalboun and Semi plant where eco-briquettes are manufactured followed by demonstration of the shredding machine. Besides, for the purpose of raising awareness about this topic and relevant concerns such as pollution, global warming, climate change, random hunting, and deforestation, several workshops were conducted in most of the villages surrounding the reserve” (IUCN, 2018).

new projects and strategies and facilitate the implementation of ongoing projects. Under appropriate program of community benefits/assistance (D.8), scores ranged between 3 and 4 because the community use of natural resources and projects activities of direct community benefit are partially identified and in place. With regards to visitor management (D.9) and natural resource and cultural protection activities undertaken (D.10), SBR scores between 3 and 4 because ecotourism visitors are well catered for. Indeed, SBR grants visitors a network of ecotourism services highlighting the revival of traditional practices that protect the environment and human beings. For instance, visitors have the opportunity to experience seasonal activities (hiking, paragliding, snowshoeing, horseback riding) and agritourism (picking fruits, vegetables, and wild edible), discover the art of soap and pottery making, spend a night or more in guesthouses, visit the beekeepers and visit cultural and eco-touristic projects. Finally, for threat monitoring (D.11), SBR scored 1 because, as discussed earlier in (D.7), the SBR lacks the availability of tools which can monitor threats.

Finally, under the third rubric, delivery of the reserve’s objectives, the framework includes two elements: **outputs (E)** and **outcomes (F)**. In outputs, planned objectives and targets are scored in terms of the extent they were achieved or delivered. Whereas, in outcomes, the evaluation investigates to what extent objectives set for local economic development, biological or ecological conservation, social sustainability, and cultural heritage of the protected area have been met.

Delivery		
E. Outputs		
E.1		Achievement of set work program
E.1.1	2	Planned targets/objectives are being achieved
E.2		Production of results and outputs
E.2.1	3	Planned outputs of work program are delivered
Total	5/10	

For **outputs (E)**, there are two indicators: achievement of set work program (E.1) and the production of results and outputs (E.2), for 2 indicators. For E.1 and E.2, scores were between 2 and 3 because planned strategies, objectives, and policies were well identified, but partially implemented due to the limited administrative, fiscal, and technical resources.

F. Outcomes		
F.1	Scoring	Conservation of Nominated Values
F.1.1	3	Condition of the cultural heritage is well maintained
F.1.2	3	Natural integrity and biodiversity values are well maintained
F.1.3	2	Threats to nominated values are controlled/reduced
F.2		Effects of BR management on local community
F.2.1	3	The BR socio-economically benefits local community
F.2.2	2	The BR does not aggravate inequalities or generate new inequalities
F.2.3	2	The BR enables spatial integration and does not cause spatial fragmentation/segregation
F.3		Education, Research, and Monitoring
F.3.1	4	Environmental awareness has increased based on activities
F.3.2	4	The site is regularly used for environmental research and monitoring
Total	23/40	

Outcomes (F) includes three sets of indicators: conservation of nominated values (F.1), effects of BR management on local community (F.2), and education, research, and monitoring (F.3), for a total number of 8 indicators. For conservation of nominated values (F.1), scores were between 2 and 3 because both cultural heritage and conservation values have been partially preserved, and threats toward these values have not been reduced. Regarding the effects of BR management on local community (F.2), scores varied between 2 and 3 because SBR benefits partially the local community, and lacks a comprehensive poverty reduction strategy that can support the most vulnerable segments of the local economy (such as women and farmers). As such, the SBR generates inequalities and enables spatial fragmentation in the Shouf region,

especially in the case of villages that are not located in the transition zone. Finally, for education, research, and monitoring (F.3), both indicators scored 4 because environmental awareness has increased in the SBR based on various activities.

In sum,

- (A) **Context** indicators scored 29 out of 65 (the highest possible score), i.e. 44.6%
- (B) **Planning** indicators scored the lowest with 25 out of 120 (the highest possible score), i.e. 39.2%
- (C) **Input** indicators scored 63 out of 44 (the highest possible score), i.e. 55.6%
- (D) **Process indicators** scored 63 out of 125 (the highest possible score), i.e. 50.4%
- (E) **Outputs** indicators scored 5 out of 10 (the highest possible score), i.e. 50%
- (F) **Outcomes** indicators scored 23 out of 40 (the highest possible score), i.e. 57.5 %

In total, the total score of all indicators reaches 192 out of 405 (the highest possible score), i.e. 47.4%.

B. Findings and Discussion

In this section, I suggest sorting indicators to identify the ones that need to be addressed in to improve the management and planning performance of the SBR.

Only 14 (out of 81) indicators score high (between 4 and 5):

- 4 related to (A) **context**: level of significance (values), constraint or support by political and/or civil environment;
- 2 related to (B) **planning**: size and zoning are appropriate and adequate to conservation, development, and research, and tools to manage impacts on natural resources;
- 1 in (C) **inputs**: appropriate equipment, vehicles facilities are available;

- 5 in (D) **process**: ecotourism visitors are well catered for, staff meetings are used for learning, an environmental awareness and education program is in place, leadership is effective and adequate

- 2 (E) **outputs**: the site is regularly used for environmental research and environmental awareness has increased based on activities.

45 indicators score very low (between 1 and 2):

- 6 in (A) **context** : potential for sustainable development, national authorities and leaders are supportive, national protected area legislation is inclusive of BRs, BR is integrated in the national strategies, development plans, and laws, availability of a regional spatial plan.

- (B + D) **planning and process**:

> 20 out of 24 planning indicators scored between 1 and 2; the lowest ones being: land-use planning authorities account for BR, effective decentralization regulations, land ownership status issues, land acquisition program, buffer zone boundaries delineation, annual reports on the progress towards set targets, masterplan for prioritizing conservation and regulating development, indicators to monitor progress towards set targets, effective land-use planning authorities, regional and local governments account for BR in their work, issues of land tenure, core zone boundaries delineation, the transition boundary is known, the reserve is managed under one authority, management plan for the site is developed, a review for the management plan, a map of cultural and landscape landmarks, subsidiary plans, the reserve management plan follows adaptive management, periodic review submission.

> For process, out of 25 indicators, 10 indicators scored between 1 and 2, including: availability of an advisory committee consisting of key stakeholder groups, Local

involvement in the planning and decision-making process, local communities involvement in drawing up the management plan, local communities involvement in the implementation of the management plan and land management, local communities participate in the regular management of the BR, availability of conflict resolution mechanisms, management effectiveness evaluation is undertaken, major threats are monitored and reported, effective means of communication and division of responsibilities are in place in the reserve, staff and reserve's departments are capable of enforcing policies and laws inside the reserve.

The rest of other indicators' scores were equal to 3 (weak); these included many *process* and *input*. These were respectively related to governance corruption, skill level of staff, application of management policies, visitor's impact on the reserve, and activities to conserve cultural and natural resources (for process), and to resource constraints at the level of staffing and funding (for input) (Figure 7).

Furthermore, mean scores for the total 31 headline indicators were calculated (See Figure 8), and results were consistent with the above data. Indeed, "*planning*" scored the lowest, followed by the "*process*", and "*context*" elements (Figure 8). Based on these results, the evaluation of SBR reveals a "*very weak*" and "*basic*" level of management. The lowest scores were attributed to "planning" indicators pointing at constraints in terms of tenure issues, unclear boundary demarcation of zones, and effective land-use planning authorities, as well as effective decentralization. Other notable weaknesses in management and planning relate to the lack of involvement of communities and stakeholders in SBR planning and decision-making. Moreover, the contextual factors that are the lowest relates to *legislative aspects* such as environmental

and national policy, regional integration, and support by political and/or civil environment.

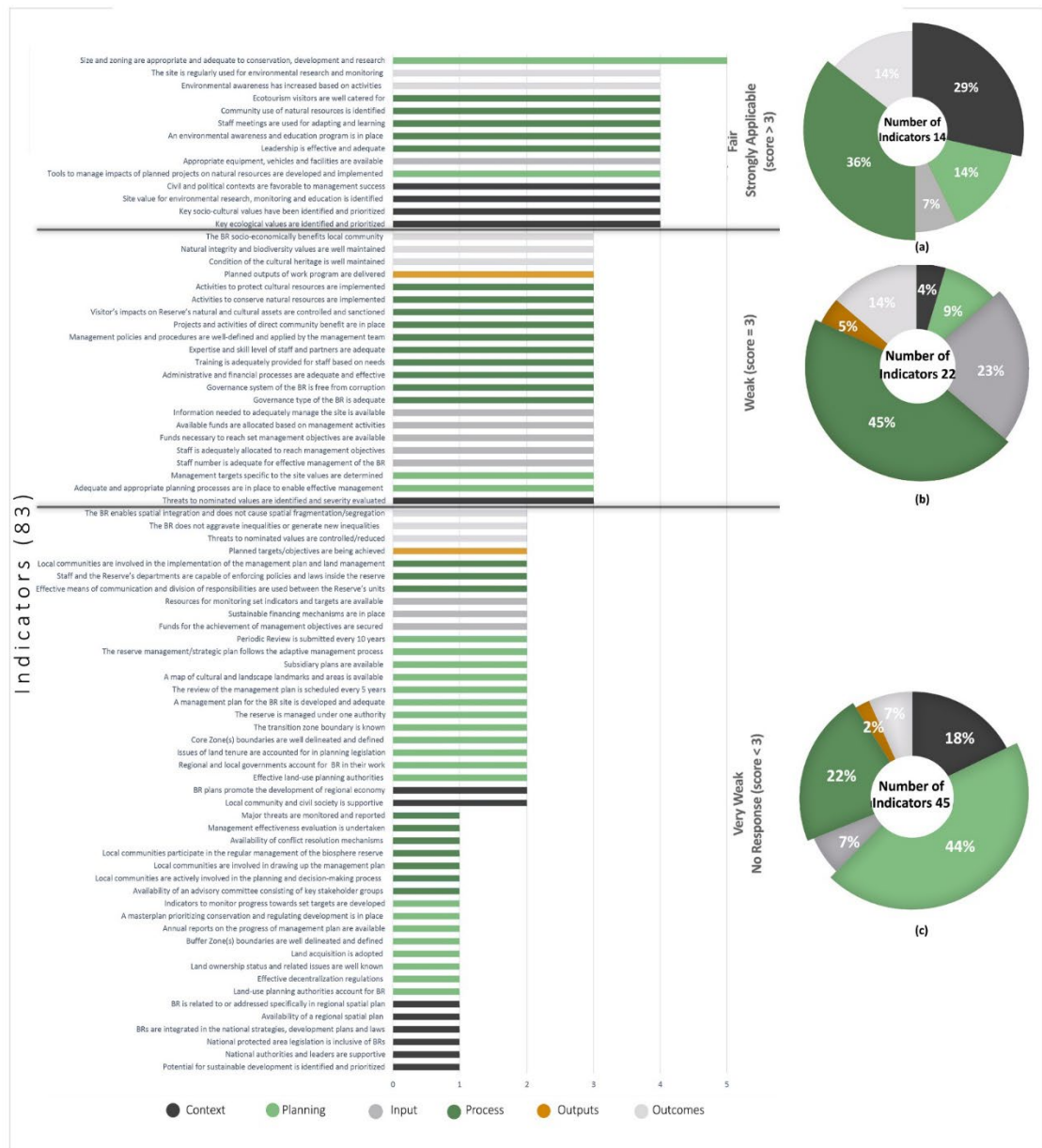


Figure 7: Scoring of Indicators in descending order.

Source: Azzam 2022

Thus, the most cited challenges that have negatively influenced the successful implementation, effective management and planning process in the SBR include: unclear boundary demarcation of zones resulting in conflict with private landowners, lack of integration into national environmental legislative framework and land use planning, climate change and the risk of forest fires, as well as general shortage of financial and human resources.

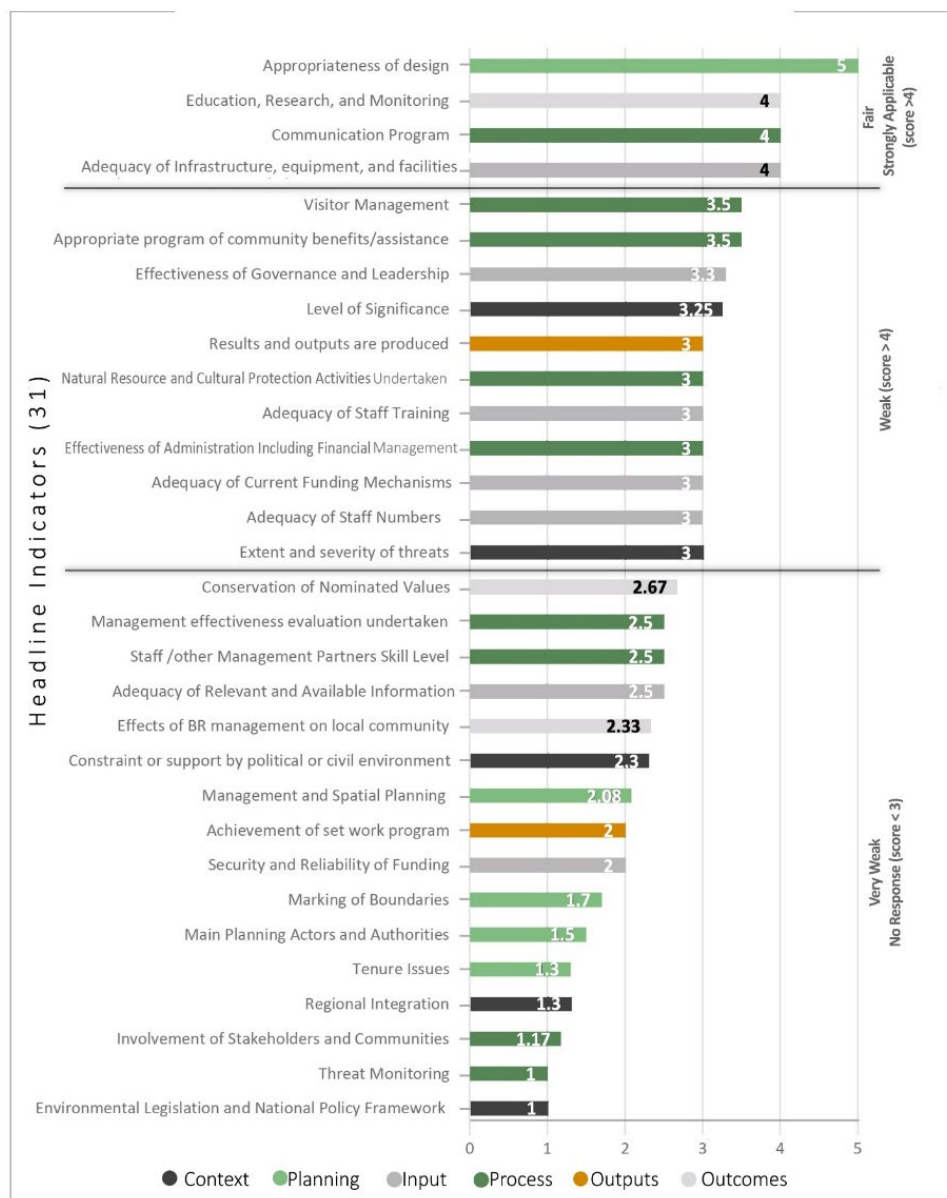


Figure 8: Mean scores for indicators in descending order
Source: Azzam 2022

With respect to government support and oversight, the evaluation revealed that the management team of SBR carries the weight of fundraising and as such has relied on international networking and grant writing to secure income for the implementation of management strategies. This shift in the responsibility for the management of BRs by the management team rather than by the government has been reported in other countries (Balasinorwala, 2014) and has led the protected area management to establish new and independent strategies to generate income from entrance fees, international funds, and reserve's activities.

The role of urban and regional planners in improving the management and planning strategy in the SBR is complex due to the fact that the SBR's major weaknesses and issues are distributed at different levels (national, regional, and local).

The key issues/priorities that I am addressing in this thesis are indicators that have the lowest mean scores (figure 3), namely:

- Under **context**, "*Environmental Legislation and National Policy Framework A.4 and Regional Integration A.5*",

- Under **planning** "*Main planning actors and authorities B.1, Tenure Issues B.2 and Marking Boundaries B.3, Management and Spatial Planning B.5,*

- Under **input** "*adequacy of relevant and available information C.5*", and

- under **process** "*Staff/other management partners skills D.4, Involvement of Stakeholders and communities D.5, management effectiveness evaluation D.7 and threat monitoring.11 are undertaken .*

For Context "*Environmental Legislation and National Policy Framework A.4 and Regional Integration A.5*", the evaluation above shows that SBR has no specific legal basis in Lebanon, which leads to major implications on the management model,

thus constituting challenges on institutional bodies such as overlapping jurisdictions between statutory authorities. The day-to-day management of SBR is done by a local NGO (ACS), which does not have jurisdiction over natural resources. This constitutes a major challenge moving forward in the implementation of the Lima Action Plan and the new MAB strategy. Conferring legal status for the SBR designation nationally, and integrating it into the local protected area system, is not sufficient for their future success. As mentioned in chapter 3, the bottom-up approach has succeeded in establishing the SBR, but its ability to implement a successful management model in SBR is not sufficient. We have to rethink and empower the capacity of the Lebanese government to enforce BR legislation. The government should account for SBR and propose national and regional environmental strategies to combat forest fires and upgrade land that is prone to desertification, poverty forested, and biological conservation.

***For Planning** “Main planning actors and authorities B.1, Tenure Issues B.2 and Marking Boundaries B.3, Management and Spatial Planning B.5, local planning authorities should account for SBR, and help the reserve in demarcating its boundaries to conserve and restore biological diversity, ecological integrity, and ecosystem services and decrease the current anthropogenic activities. Re-defining the coordination between local governance structures to strength their ability to design masterplans prioritizing conservation and regulating development within SBR territories is essential. Re-thinking the current management model and encouraging the implementation of an adaptive management process, which enables each project to be assessed, reviewed, re-evaluated and reported for/by an advisory committee who*

includes environmental engineers, scientific coordinators, and urban planners with a professional level of expertise is also a must.

For Input “*adequacy of relevant and available information C.5*”, research and information needed to adequately manage the site is considered one of the important aspects to conservation and protection of the environment. Conducting continuous research in the SBR helps the management team and people around the reserve to get regularly informed about the importance of conservation (ecological and cultural values), as well as challenges they face, it also contributes in publicizing SBR as well as its biodiversity, promotes ecotourism and most importantly shows people the value of the natural environment (Laurance, 2013). SBR has minimal research infrastructure, as such, the management team should establish partnerships with research organizations to generate knowledge that guides management strategies, helps in ecological restoration, and supports local community participation.

For Process, “*Staff/other management partners’ skills D.4, Involvement of Stakeholders and communities D.5, management effectiveness evaluation D.7 and threat monitoring are undertaken (D.11) indicators need strengthening*”. The evaluation shows a weak BR implementation due to limitations in the necessary management skills and experience in Shouf. Initiatives for the SBR management team should be provided to increase knowledge of ecological processes and ecosystem services. Cooperation and coordination between local management bodies, local communities, and stakeholders should be mandated to the SBR. The main aim of BR programs, when first established, was to ensure the involvement of people in the management process (Boreback, 2013). A study conducted in African biosphere reserves showed that the successful management of BRs entails the inclusion of local

stakeholders such as scientists, farmers and residents, as they help contribute to a better environment and management that benefit both the reserve and the people (de Bisthoven, 2021). Locals 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 (Saalimas, 2000).

Although community involvement is the objective of the SBR, the scope of involving and impacting local communities is still limited in scope and focuses on interventions that primarily benefit the area under protection with minimal benefit to nearby residents. This leads to dissatisfaction. 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.

Thus, local community and key stakeholders' (tourism operators, experts, urban planners, landowners, farmers, agriculturalists) participation and collaboration should be promoted through the establishment of an advisory committee. This committee should be actively involved in the planning and decision-making process, involved in drawing up the management plan, participate in the regular management of the biosphere reserve (e.g. through institutionalized consultation mechanisms, such as permanent assembly or consultations on specific projects), and propose conflict resolution mechanisms (negotiation, mediation, arbitration, or adjudication). Hence, the SBR should provide an open space for communication, allowing for the interchange of ideas and opinions to guarantee that unheard voices are heard and considered. Such techniques are extremely important because they tend to improve

social cohesiveness among many stakeholders, clarify local perspectives, and result in improved strategies that meet the demands of various stakeholders.

Furthermore, the SBR should regularly undertake the evaluation of management effectiveness through its staff members to keep monitoring threats and propose strategies in line of the ecological conservation parameters.

In closing, the SBR face many challenges for the effective implementation of the BR concept, presently and in the foreseeable future. Based on a synthesis of management and evaluation frameworks, the chapter provided a detailed assessment of key BR indicators that showed how the management and planning strategy in SBR is considered very weak.

The most prominent challenges that impede the successful implementation, effective management and planning process in the SBR include:

- Unclear boundary demarcation of zones resulting in conflicts with private landowners
- Lack of integration into national environmental legislative framework and land use planning,
- Lack of stakeholders involvement, and lack of local community participation
- Climate change and the risk of forest fires.

CHAPTER V

CONCLUSION

A. Summary

The thesis documented the Shouf Biosphere Reserve's policy making process, management model, and the challenges it faces in terms of spatial planning, using an evaluation model extracted from a critical review of three management evaluation frameworks, combined with the review of effective spatial planning practices.

The thesis shows that the Biosphere Reserve concept (i.e. triple zonation) has been imported to Lebanon by local environmental experts and activists to protect biodiversity and the natural environment, against many odds. However, the Shouf Biosphere Reserve is still operating as a protected area without the formal government support normally awarded to protected areas. The thesis argued that one of the main constraints of the SBR relates to the inadequate implementation and management of spatial planning requirements, namely: the lack of clear boundaries' demarcation of BR zones, which is mainly due to the lack of data regarding landuse, land cover and land tenure. This is a major hurdle resulting in conflicts and tensions between private landowners and the SBR's management team. Another major constraint identified in the thesis relates to the intersections between diverse public units, programs and decisions issued from different government institutions (MoE, MoA, and MoIM) that do not coordinate and collaborate to align their programs with the BR principle.

B. Research Contribution

This thesis contributed to enriching the literature on the management and evaluation of BRs' effectiveness by incorporating a spatial planning lens, with a focus on deliberative planning tools. As such, the thesis proposes a more integrated management model for BRs, one that takes into account spatial planning principles, tools and modalities. Using the Shouf Biosphere Reserve as its case-study, the thesis proposed an alternative assessment model for BRs' management, accounting for planning dimensions. Furthermore, this thesis contributed to producing knowledge on the needed regional modes of governance and planning to better manage the Shouf BR in Lebanon. More precisely, through a quantitative assessment, it identified the main constraints that hinder the reserve's effective management, with a focus on spatial planning. Furthermore, it particularly highlighted the need to rethink regional planning modalities and tools to advance a more effective planning practice, across scales.

C. Limitations


The thesis' quantitative assessment of the SBR is done using impressionistic data rather than systematic and rigorous measures, as it was challenging to access precise data during the pandemic which coincided with the time of data collection and analysis. As such, many assumptions needed to be done and the scoring system was mostly based on a preliminary reading of the documents related to the SBR. This assessment could certainly benefit from a more rigorous methodology, particularly about scoring techniques.

Additionally, the thesis could have benefited from reviewing successful case-studies of BRs' management in similar fragile contexts like Lebanon, and extracted

lessons that could have better informed the recommendations made. Future research could address this point and contribute to providing a clearer roadmap of interventions that could be introduced to improve BRs' management from a planning perspective.

Lastly, the thesis was done during the time of the Covid-19 pandemic, which prevented conducting qualitative interviews and participant observation like was originally planned. This certainly limits the thesis' in terms of enriching and triangulating its data, beyond its normative claims.

APPENDIX I

**الجمهورية اللبنانية**
وزارة البيئة

الوزير

بيروت في، ١٠ يوز ٢٠١٨

قرار رقم ١/٧٨٦

الغاء القرار رقم ١/٧٨ تاريخ ٢٠١٢/٥/١٦

المتعلق بالتحاق موظف بلجنة محمية ارز الشوف الطبيعية

إن وزير البيئة

بناء على المرسوم رقم ٣ تاريخ ٢٠١٦/١٢/١٨ (تشكيل الحكومة)،

بناء على المادة الاولى من القانون رقم ٢١٦ تاريخ ١٩٩٣/٤/٢ (احداث وزارة البيئة)،

بناء على القانون رقم ٦٩٠ تاريخ ٢٠٠٥/٨/٢٦ وتعديلاته (تحديد مهام وزارة البيئة وتنظيمها)،

بناء على المرسوم الاشتراعي رقم ١١١ تاريخ ١٩٥٩/٦/١٢ وتعديلاته (تنظيم الادارات العامة)،

بناء على المرسوم الاشتراعي رقم ١١٢ تاريخ ١٩٥٩/٦/١٢ وتعديلاته (نظام الموظفين)،

بناء على المرسوم رقم ٢٢٧٥ تاريخ ٢٠٠٩/٦/١٥ (تنظيم الوحدات التابعة لوزارة البيئة وتحديد مهامها وملاكها وشروط التعيين الخاصة في بعض وظائفها)،

بناء على المرسوم رقم ٦٧٤٨ تاريخ ٢٠١١/١٠/٢٩ (تعيين مهندسين واختصاصيين متمرنين في ملاك وزارة البيئة ونقل اعتماد من احتياطي الموازنة العامة لعام ٢٠١١ على أساس القاعدة الاثنتين عشرية)،

بناء على القرار رقم ١/٧٧ تاريخ ٢٠١٢/٥/١٦ (الحاق السيد نزار هاني اختصاصي بيئي متمرن بدائرة الانظمة الايكولوجية)،

ومن أجل ضرورات العمل وتسيير المصلحة العامة،

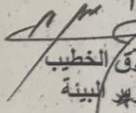
بقرار ما يلي:


المادة الاولى: يلغى القرار رقم ١/٧٨ تاريخ ٢٠١٢/٥/١٦، بحيث يعود ويلتحق السيد نزار هاني الموظف الدائم في وزارة البيئة بصفة اختصاصي بيئي رقمه الالي ١١٠٦٥٩، بالإدارة المركزية لوزارة البيئة، على أن يمارس وظيفته في دائرة الانظمة الايكولوجية- مصلحة الموارد الطبيعية، طيلة أيام العمل الفعلي، ويقوم بالمهام التي يكلفه بها الرؤساء التسلسليون، دون ان يكون له الحق بالمتابعة و/أو الاشراف على ادارة لجنة محمية ارز الشوف الطبيعية وفرق عملها وتقديم الدعم اللازم لها او القيام بأي من الامور اللوجستية والميدانية المتعلقة بها.

المادة الثانية: يعمل بهذا القرار فور صدوره، ويلغى كل نص يتعارض مع مضمونه.

المادة الثالثة: ان التقاعس في تنفيذ هذا القرار يحمل صاحبه المسؤولية المسلكية.

المادة الرابعة: يبلغ هذا القرار من يلزم.


طارق الخطيب
وزير البيئة



نسخة تبلغ الى:

- مجلس الخدمة المدنية
- هيئة التفتيش المركزي
- المديرية العامة للبيئة.
- مصلحة النيران- دائرة الشؤون الوظيفية والمالية واللوازم- قسم الشؤون المالية- قسم الشؤون الوظيفية (الملفات الشخصية)
- مصلحة الموارد الطبيعية- دائرة الانظمة الايكولوجية
- صاحب العلاقة

وزارة البيئة، مركز اللعازرية، الطابق الثامن، بلوك A-4

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