A dissertation submitted to the Department of Environmental Sciences and Policy of Central European University in part fulfilment of the Degree of Doctor of Philosophy

STATUS OF CONCEPT IMPLEMENTATION AND MANAGEMENT EFFECTIVENESS OF BIOSPHERE RESERVES IN THE ARAB REGION

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ABSTRACT OF DISSERTATION submitted by:
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The growing number of Protected Areas (PA) as a global strategy for conservation and sustainable development still doesn't match the demands of biodiversity and sustainability goals. Conservation experts have hence questioned the effectiveness of PAs in serving their objectives, and large efforts have been invested in improving the evaluation of Protected Area Management Effectiveness including the development of Management Effectiveness Evaluation tools. In parallel, there is growing evidence about the usefulness of adopting adaptive and collaborative management (co-management) approaches for optimizing management performance of certain types of PAs, specifically those presenting complex social-ecological systems such as Biosphere Reserves (BR). BRs are international sites designated by UNESCO under the Man and Biosphere (MAB) program launched in 1971, and intended to serve the 3 functions of conservation, socio-economic development, and logistic support (environmental education, research and monitoring). Organized into a world network with underlying regional networks, BR numbers grew to 651 in 120 countries. The implementation and management effectiveness of BRs still lack a systematic and rigorous evaluation worldwide, and specifically in Arab countries. This is partially explained by the (1) absence of a standard and appropriate set of indicators, and (2) serious pitfalls in the Periodic Review process, the only reporting requirement by UNESCO-MAB authorities.

The current research addresses this challenge by studying the status of BR concept implementation and management effectiveness of BRs within the ArabMAB Network. The research utilizes a mixed methods approach that combines informal interviews, online survey, document review, and in-depth face-to-face interviews with key informants. The survey uses an innovative evaluation framework with 34 indicators developed based on an existing Common Reporting Format, allowing for comparative analysis with Global Study results of PA/BR management effectiveness. Quantitative analysis (N=17) reveals an overall management effectiveness score (6.31) greater than the global average (5.30) used as a benchmark, both falling in the "basic" management range. Factors most largely determining the management performance of Arab BRs are similar with the Global Study findings for the process-related indicators "communication programs" and "administrative processes including financial management". Overall management effectiveness is mostly determined by achievement of outputs and outcomes in ArabMAB, in contrast with input and processes in the Global Study.

Combining results of the mixed methods approach, the dissertation identifies 7 priority areas for the improvement of concept implementation and management effectiveness of Arab BRs:
- Communication, collaboration and cooperation
- ArabMAB institutional gaps
- Understanding and differentiation of the BR concept
- Integration and mainstreaming of the MAB program
- Involvement and participation of local communities
- Evaluation of biosphere reserve management

■ Capacity and resources (cross-functional)

Recommendations are developed for both addressing these challenges, and improving the evaluation of BR management effectiveness in the Arab region. The dissertation argues for the adoption of adaptive co-management as an approach to increase resilience of the ArabMAB Network and invest in long-term solutions. However, more research is needed to explore the usefulness and limitations of this approach for PA/BR management in a similar context constrained by resources and threatened by conflicts.

Keywords: Adaptive management, Arab, biodiversity, biosphere reserve, collaborative management, conservation, evaluation, Man and Biosphere MAB, management effectiveness, protected area, social-ecological system, sustainable development, UNESCO.

Dedication

In memory of my grandfather *Pierre Cherfan* who wisely instilled in me the title

I have earned today…

Acknowledgements

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List of Abbreviations

ACM	Adaptive Co-Management
AFED	Arab Forum for Environment and Development
AM	Adaptive Management
BHI	BREMi Headline Indicator
BIP	Biodiversity Indicators Partnership
BR	Biosphere Reserve
BREMi	Biosphere Reserve Evaluation of Management indicators
CBD	Convention on Biological Diversity
CBNRM	Community Based Natural Resources Management
CDC	Centre for Disease Control
CIA	Central Intelligence Agency
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMP	Conservation Measures Partnership
CMS	Convention on the Conservation of Migratory Species of Wild Animals
COP	Conference Of the Parties
CRF	Common Reporting Format
EOAR	Environment Outlook for the Arab region Report
GEC	The Green Economy Coalition
GEF	Global Environment Facility
GoBi	Governance of Biodiversity research project
HDI	Human Development Index
HI	Headline Indicator
HIMA	Human Integrated Management Approach
IACBR	International Advisory Committee for Biosphere Reserves
ICC	International Coordinating Council
IUCN	International Union for Conservation of Nature
IUCN-Med	International Union for Conservation of Nature - Mediterranean
LDC	Least Developed Country
MAB	Man and Biosphere
MAP	Madrid Action Plan
MDG	Millennium Development Goal
MEE	Management Effectiveness Evaluation
METT	Management Effectiveness Tracking Tool
MLA	Multi-Lateral Agreement
MOE	Ministry of Environment
mTRA	modified Threat Reduction Assessment
NGO	Non-Governmental Organization
PA	Protected Area
PAME	Protected Area Management Effectiveness
PoWPA	Programme of Work on Protected Areas
PR	Periodic Review
RAPPAM	Rapid Assessment and Prioritization of Protected Area Management
RSCN	Royal Society for the Conservation of Nature
SCBD	Secretariat of the Convention on Biological Diversity

SPSS	Statistical Package for the Social Sciences
TRA	Threat Reduction Assessment
UAE	United Arab Emirates
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNESCWA	United Nations Economic and Social Commission for Western Asia
UNU-INWEH	United Nations University Institute for Water, Environment and Health
WB	World Bank
WCMC	World Conservation Monitoring Centre
WCPA	World Commission on Protected Areas
WDPA	World Database on Protected Areas
WH	World Heritage
WHC	World Heritage Center
WHS	World Heritage Site
WNBR	World Network of Biosphere Reserves
WPC	World Parks Congress
WWF	World Wide Fund for Nature

CHAPTER 1: INTRODUCTION

The introductory Chapter seeks to define the research area and topic based on a clearly demonstrated rationale, establish the research focus by defining the scope and questions addressed by the dissertation; and delineate the research aim and objectives. The following important questions are addressed: (1) what is this research about? (2) why is it important? and (3) what will its results contribute to? In the process of defining and justifying the research, main themes of the literature review that will be comprehensively covered in Chapter 2 are briefly presented. The Chapter closes with a presentation of the dissertation's structure.

1.1 Background

1.1.1 Management effectiveness: increasingly critical for protected areas

Protected Areas (PAs) are the cornerstone of global conservation strategies and agendas; their numbers have exponentially increased over the past century, reaching 209,000[1] on the World Database on Protected Areas (WDPA) in 2014 (Juffe-Bignoli *et al.* 2014). Yet, the Convention on Biological Diversity (CBD) 2010 global conservation target "to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level […] to the benefit of all life on Earth" was not met (2010 BIP 2010). In response, the CBD Parties adopted the Strategic Plan for Biodiversity 2011-2020, including 20 Aichi Biodiversity Targets (Decision X/2) of which Target 11 stipulates that:

> "*By 2020, at least 17% of terrestrial and inland water areas, and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through **effectively** and equitably managed, ecologically representative and well-connected systems of protected areas and other **effective** area-based conservation measures, and integrated into the wider landscape and seascape.*" (CBD 2012) (emphasis added)

This relatively new target for PAs clearly emphasizes the importance of *effectiveness*, highlighted as well in the 2012 Protected Planet report:

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[1] "These are all sites designated at a national level (e.g. national parks), under regional agreements (e.g. Natura 2000 network) and under international conventions and agreements (e.g. natural World Heritage sites). The UNESCO Man and Biosphere Reserves were not included in the calculations, as many of their buffer areas do not meet the IUCN protected area definition. Proposed protected areas and protected areas recorded as points without a reported area were also excluded. In addition, all overlaps between different designation types were removed from the calculations to avoid double counting." (Juffe-Bignoli 2014, 8).

> "**Effective** *protected areas are essential for the achievement of several of these (Aichi) targets, in particular Targets 5 and 12, which concern habitat and species loss*" (Bertzky *et al.* 2012, 2) (emphasis added).

In the more recent 2014 version of the report, lack of effectiveness was cited as one of the reasons behind failure to halt biodiversity loss (Juffe-Bignoli *et al.* 2014). In that perspective, PA Management Effectiveness (PAME) evaluation has become a priority measure towards achieving the 2020 global targets for protected areas and biodiversity:

> "**Assessing** *whether* **protected areas are being effectively managed** *is a crucial element of Aichi Biodiversity Target 11, and a vital prerequisite for achieving protected area objectives*" (Juffe-Bignoli *et al.* 2014, 25) (emphasis added)

The increase in focus on the *management effectiveness* aspect of PAs, was translated into stricter requirements by international conventions to conduct PAME evaluations. The 30% requirement for CBD parties to conduct and report PAME evaluations by 2010 was doubled to 60% for the 2010-2015 period (CBD 2010). Furthermore, the CBD Program of Work (PoW) goal 1.4 calls:

> "*...for all protected areas to have effective management in existence by 2012 […] noting that to assess the effectiveness of the management, specific indicators may also be needed to: (a) Continue to expand and institutionalize management effectiveness assessments to work towards assessing 60 per cent of the total area of protected areas by 2015 using various national and regional tools and report the results.*" (CBD 2010, 5)

However, a 2013 appraisal showed that only 29% of PAs had completed and reported the required Management Effectiveness Evaluations (MEE); 90 countries (of 196 parties reporting to the Convention) had demonstrated reaching the 30% target of 2010, and only 45 achieved the 60% target of 2015 (Juffe-Bignoli *et al.* 2014; CBD 2015). This wide gap between the CBD requirement and implementation, points at the need for "expanding and institutionalizing" assessments worldwide. However, since the relationship of PAME with social and conservation outcomes is still debated in literature, there's a parallel need to increase the understanding of the mechanisms by which they relate (Juffe-Bignoli *et al.* 2014; Carranza *et al.* 2014).

1.1.2 International management effectiveness evaluation discourse

1.1.2.1 Protected areas management effectiveness evaluation

PAME has been defined by Hockings and colleagues (2006: xiii) as a reflection of (1) *design* relating to both individual sites and PA systems; (2) *adequacy and appropriateness* of management systems and processes; and (3) *delivery of PA objectives* including conservation of values. On the other hand, MEE has been defined as "the assessment of how well the PA is

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being managed – primarily the extent to which it is protecting values and achieving goals and objectives" (Hockings *et al.* 2006, xiii). Building on these background definitions and empirical evidence, international experts have developed MEE tools based on the framework created by a special taskforce from the International Union for the Conservation of Nature (IUCN) - World Commission on Protected Areas (WCPA) (Hockings 2003). These tools have been improved with time, and gradually adopted by many organizations worldwide such as the World Wide Fund for Nature-World Bank (WWF-WB) Alliance. They were adapted to different types and management objectives of PAs. In this perspective, the discourse on PAME evaluation has evolved with the leadership of the WCPA taskforce.

1.1.2.2 *International conservation programs and management effectiveness evaluations*

In parallel, other international site conservation programs such as the World Heritage Sites (WHS) program (under the World Heritage Convention) and the UNESCO Man and Biosphere (MAB) program evolved and developed their own evaluation tools. In 2008, UNESCO in partnership with IUCN published the *Enhancing our heritage toolkit: Assessing management effectiveness of natural World Heritage sites* providing a set of guidelines and tools for the effective management and evaluation of natural WHS(s) (Hockings *et al.* 2008). This was followed by the 2014 publication of the first global assessment of natural WHS providing a conservation outlook assessment for all natural WHS(s) (Osipova *et al.* 2014). Moreover, evaluation of WHS(s) started very early (1972 as part of the Convention) in the form of a *World Heritage in Danger* list, which identifies WHS(s) of which special properties are threatened. Corrective measures are then suggested, and if not respected, the WHS can face delisting (UNESCO WHC 2015).

On the other hand, the UNESCO-MAB experience in evaluation has been slower and less rigorous so far (Price *et al.* 2010). Until recently, there was no process for identifying "unsatisfactory concept implementation or management" of BRs that would similarly qualify them for a "danger list". The Periodic Review (PR) process was introduced in 1996 (22 years after the first BR was designated) after the Seville meeting as the sole evaluation requirement for Biosphere Reserves (BRs), to be conducted on a 10-year basis (UNESCO 1996). Until recently, the PR has proven to be a soft tool receiving a low response rate and in need of improvement (Price *et al.* 2010; Lotze-Campen *et al.* 2008; Ramadan-Jaradi pers. comm.).

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1.2 Justification for research

The review of literature shows many gaps in the area of PA/BR management effectiveness evaluation, which are more proclaimed in certain regions of the world. The identification of these gaps has led to defining the subject and scope of this research in the perspective of bringing an original contribution to the field.

1.2.1 Global gaps in management effectiveness evaluation

The literature has demonstrated the established need to increase evaluation and reporting of world conservation programs for better compliance with biodiversity-related conventions and halting the loss of natural values (Section 1.1). The UNESCO-MAB program is one of the international programs recently gaining more attention for its need to improve the rigor of its management effectiveness evaluation. This would entail a standardized set of indicators, which would improve and complement the effectiveness of the BR evaluation process currently relying solely on the periodic review process. Though efforts have been made to update the PR tool and increase compliance (UNESCO 2014a), there are still serious pitfalls in the monitoring system of BRs. Notably, there is a "lack of indicators and mechanisms to review effectiveness in BRs" (Lotze-Campen *et al.* 2008, 113). Studies to evaluate the implementation and effectiveness of the PR process at national and regional levels are very recent, and limited to the UK (Price 2002; Price *et al.* 2010) and Canada (Reed and Egunyu 2013). More research is needed to identify factors that contribute to compliance with the PR process, as well as its usefulness in improving the management of BRs locally and internationally.

> Identified research gaps (1)
> Management effectiveness evaluation and reporting of UNESCO BRs worldwide, including:
> 1- Standardized set of indicators for the MEE of BRs
> 2- Better understanding of the effectiveness of the PR process locally and regionally

1.2.2 Gaps more prominent in the Arab region

The largest study on PAME to date: the *Global Study into Management Effectiveness of Protected Areas* (referred to as the Global Study) compiles and reviews 8000 assessments for over 4000 sites internationally using a wide range of methodologies (Leverington *et al.* 2010b). The review, which investigates the most important factors leading to effective management of PAs, reveals a clear paucity of PAME information on the Arab region. Another recent (2004-2008) global survey: *The Governance of Biodiversity* (GoBi) research project specifically targeting sites designated as UNESCO BRs, investigated management and governance factors that most influence the success or failure of BRs internationally (Stoll-Kleemann *et al.* 2008; Stoll-Kleemann and Welp 2008). Similarly, the Arab region is not well represented in GoBi as

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the few participating countries' results were "diluted" into the broader Asian and/or African territories limiting the possibility to provide a regional assessment of BR management (Stoll-Kleemann *et al.* 2008). The gap in published research on both PAME and BR management effectiveness evaluations in the Arab region point at the needs to (1) identify reasons for this research gap; (2) conduct evaluations of PA/BR management effectiveness in the Arab region, and build capacities of BR managers to systematically evaluate management effectiveness as part of an adaptive management approach.

Identified research gaps (2)
3- Rationale for Arab region under-representation in global studies on PAs and BRs
4- Regional management evaluation and reporting of Arab PAs and BRs

1.2.3 Rationale for focusing on biosphere reserves

Though the need for both PA and BR MEEs in the Arab region have been identified in the literature, the research focuses on BRs rather than all types of PAs based on the following rationale:

1. BRs have been generally excluded from the PAME literature to a large extent internationally, and more so regionally.

2. There is a more pressing need for improving the evaluation and reporting of BRs in the global and Arab region contexts, which entails improving local capacities to develop, conduct and integrate such evaluations in their BR management system.

3. BR management evaluation is currently more challenging - and in need of improvement - due to the absence of clear and practical guidelines from UNESCO-MAB on the management of buffer and transition zones.

4. PA categories, management objectives, and evaluations can differ widely (Dudley 2008, 2013); limiting the scope of this research to the well-defined BR allows for a standard approach to the research, and the development of more specific recommendations.

5. BRs encompass PAs - usually embedded in their core areas - and incorporate sustainable development at the heart of their mission. Therefore, through their functional zonation model that integrates conservation, development, and logistic support (Section 1.3.1), they have a more explicit contribution to make to global sustainable development goals. In that perspective, improving BR management effectiveness can play a significant role in the fulfilment of the Post-2015 development agenda in addition to their contribution to conservation-focused agendas (UNESCO 2015a).

1.3 Research scope

The following Section provides a general introduction on the unit of analysis (BR), and geographic scope (Arab region) of the research.

1.3.1 Introduction to biosphere reserves

Established under the UNESCO Man and Biosphere (MAB) program in 1971, BRs are conceptualized and implemented with the intent to demonstrate a well-balanced relationship between biodiversity conservation and local development (UNESCO 1996). Although the central goal of BRs is the protection of biodiversity, they differ from PAs (especially strict conservation sites) by accepting and recognizing human settlement as a major feature of the landscape, and by having a three-zone scheme composed of a central core area of high ecological value - usually nationally designated as a PA (Dudley 2013), and surrounding buffer and transition zones where relatively higher levels of human activities take place (UNESCO 2014a).

The UNESCO-MAB program aims to provide learning and model sites for sustainable development through three main functions: (1) conservation, (2) development[2], and (3) logistic support (education, research and monitoring). BRs are organized as an international network that evolved since 1973 to now include 651 sites in 120 countries (UNESCO 2015b). The World Network of BRs (WNBR) hence represents a rich variety of valuable ecosystems embedded in different cultural mosaics. BR as a concept has been adaptive since its creation and has been continuously evolving in parallel with global sustainability and conservation agendas. The MAB program is now considered an international tool demonstrating an integrated approach to address global environmental and development challenges (UNESCO 2014a).

1.3.2 Introduction to the ArabMAB Network

BRs in the Arab region are organized into the ArabMAB Network, which constitutes the geographical scope of the research. The network includes 27 established BRs located in 11 Arab countries (UNESCO 2014a). One site has been excluded: the Intercontinental Mediterranean BR due to its transboundary nature and mixed governance with Spain. Consequently, the study targeted 26 sites located in 11 Arab countries within two broad geographic sub-regions: (1)

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[2] "development" as a function of BRs is used interchangeably with "sustainable development" throughout the dissertation, as it typically characterizes the development fostered by BRs (UNESCO 2014a).

North Africa: Algeria, Egypt, Morocco, Sudan[3], and Tunisia; and (2) West Asia: Syria, Lebanon, Jordan, United Arab Emirates (UAE), Qatar and Yemen. Figure 1 shows the countries and BRs of the ArabMAB Network, in addition to their inclusion/participation status in this research.
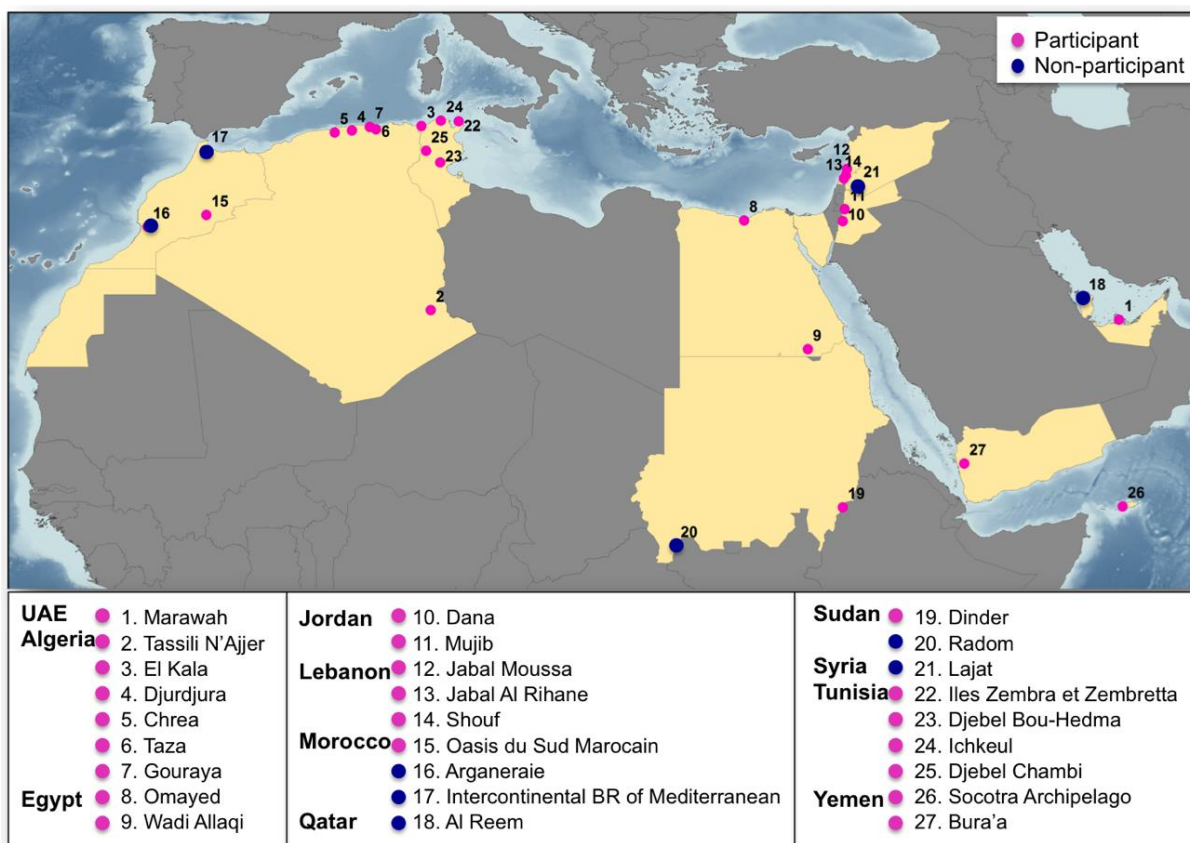
Fig. 1: Map of Arab Biosphere Reserves (2014) indicating research participation

1.4 Research questions, aim and objectives

1.4.1 Research questions

In seeking to address the identified research gaps for the Arab BRs, the dissertation has been centred on answering the overarching question:

> **How can the BR concept implementation and management effectiveness be improved in the Arab region?**

The five underlying questions that have defined the methodology and structure of the dissertation include:

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[3] Sudan was divided into South Sudan and Sudan (North) since 2011. Note that when "Sudan" is mentioned without "South Sudan" in this dissertation, it will be referring to the country before division.

Q1. For which reasons are the BRs of the Arab region under-represented in global datasets, and published research on PA/BR management?

Q2. How is the BR concept perceived and implemented in the Arab region?

Q3. a) How are the Arab BRs performing in terms of management effectiveness?

    b) How do they compare to each other and to regional and/or global results?

Q4. a) What factors most determine BR management effectiveness in the Arab region?

    b) How do these factors compare to the globally identified factors?

Q5. How can the research findings be used to improve MAB program implementation in the Arab region?

1.4.2 Research aim and objectives

This study aims at recommending specific ways to improve the concept implementation and management effectiveness of BRs in the Arab region. In order to reach this aim, the research will attempt to achieve the following objectives:

O1. Identifying potential factors conducive to the paucity of data on Arab PAs and BRs in published global data.

O2. Assessing the perception vs. implementation of BR functional priorities by local BR managers.

O3. Assessing the implementation and effectiveness of the PR process in evaluating BR management effectiveness in the Arab region.

O4. Developing an original set of standard indicators for BR MEE, and testing it in the Arab region.

O5. Characterizing the current state of management and governance of Arab BRs.

O6. Appraising management effectiveness quantitatively for Arab BRs and comparing scores to similar regional and global studies results (benchmarks)[4].

O7. Identifying characteristic BR management trends and comparing them to trends identified in similar regional and global studies results.

O8. Identifying the most determining (management and governance) factors of success/failure in Arab BRs, and comparing them to globally identified factors[5].

O9. Identifying the main contextual challenges to Arab BRs management effectiveness.

O10. Developing specific recommendations about using the research findings to improve BR concept implementation and management effectiveness in the Arab region.

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[4] Refers to: Anthony and Matar 2012; Leverington *et al.* 2010a, 2010b
[5] Reference: Stoll-Kleemann 2007

1.5 Original contribution of research

This study anticipates bringing an original contribution to the field of conservation planning and management, specifically for BRs, at four different levels as illustrated below (Fig. 2).
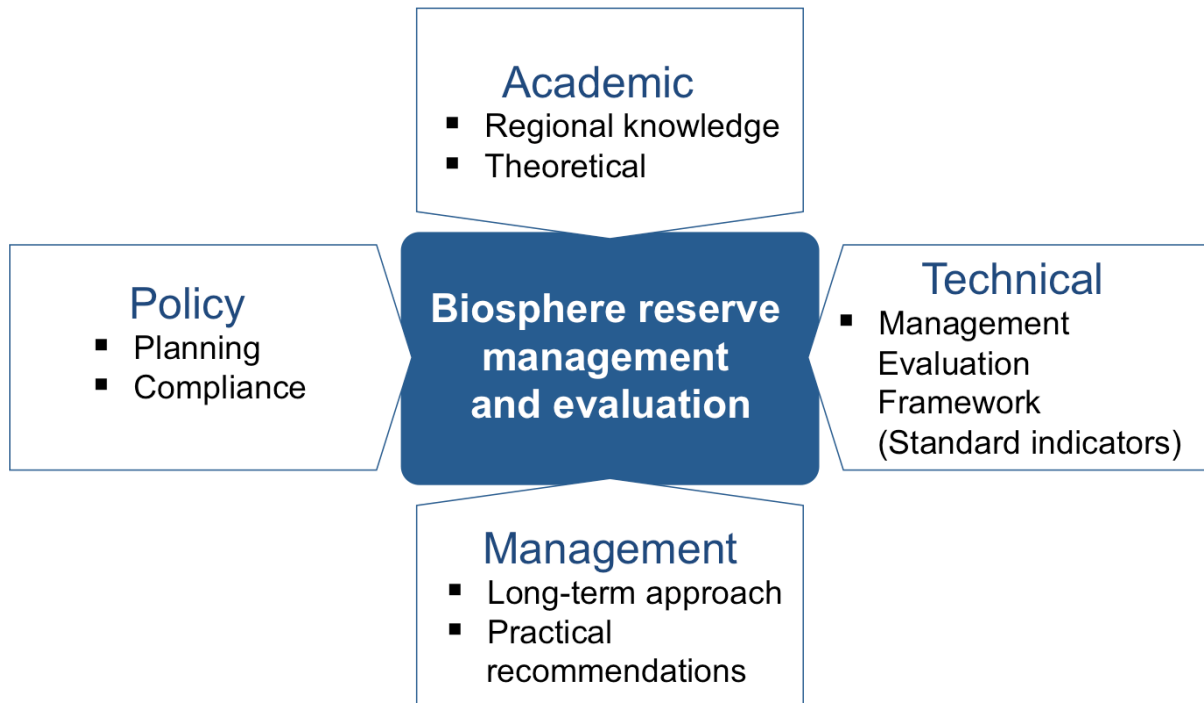
Fig. 2: Anticipated contribution of research to BR management and evaluation

These anticipated contributions will be developed as part of the conclusion of the dissertation (Chapter 8).

1.6 Dissertation structure

The structure and presentation of this dissertation is summarized in Table 1 below. Chapters 1, 2 and 3 are mostly concerned with presenting the research, its background literature and theories, while Chapter 4 presents the methodology, and Chapters 5-8 address the five research questions. The final outcome is the resolution of the overarching research question.

Table 1: Dissertation structure and presentation

DISSERTATION STRUCTURAL COMPONENTS AND OVERALL PRESENTATION	
CHAPTER 1	✓Introduces background ✓Justifies research and scope ✓Introduces the research unit of analysis and region ✓Introduces the anticipated original contribution of the research ✓Presents research aim, objectives and questions
CHAPTER 2	✓Summarizes relevant literature on PA and PAME discourses ✓Summarizes relevant literature on BR and BR MEE discourses ✓Provides a deeper justification to research ✓Provides a relevant contextual understanding of the Arab region studied
CHAPTER 3	✓Defines the relevant theories for the research ✓Provides evidence based on the literature of the importance of these theories for PA/BR management and evaluation, and their relevance as theoretical frameworks for the research ✓Summarizes criticisms and limitations of selected theories
CHAPTER 4	✓Presents the design and methodological approach to the research ✓Justifies and explains methods and tools used, and therefore **addresses Objective 4:** O4. Developing an original set of standard indicators for BR MEE, and testing it in the Arab region. ✓Describes methods' implementation and presents response levels ✓Describes methodological limitations and strategies used to address them
CHAPTER 5	✓**Answers Q1:** For which reasons are the BRs of the Arab region under-represented in global datasets, and published research on PA/BR management? By **reaching Objective 1:** O1. Identifying potential factors conducive to paucity of data on Arab PAs and BRs in published global data. ✓**Answers Q2:** How is the BR concept perceived and implemented in the Arab region? by **reaching Objective 2:** O2. Assessing the perception vs. implementation of BR functional priorities by local BR managers.
CHAPTER 6	✓**Answers Q3:** a) How are the Arab BRs performing in terms of management effectiveness? and b) How do they compare to each other and to regional and/or global results? by **reaching Objectives 5, 6 and 7**: O5. Characterizing the current state of management and governance of Arab BRs. O6. Appraising management effectiveness quantitatively for Arab BRs and comparing scores to similar regional and global studies results (benchmarks). O7. Identifying characteristic BR management trends and comparing them to trends identified in similar regional and global studies results.
CHAPTER 7	✓**Answers Q4.** a) What factors most determine BR management effectiveness in the Arab region? and b) How do these factors compare to the globally identified factors? by **reaching Objectives 8 and 9**: O8. Identifying the most determining (management and governance) factors of success/failure in Arab BRs, and comparing them to globally identified factors. O9. Identifying main contextual challenges to Arab BRs.
CHAPTER 8	✓**Answers Q5.** How can the research findings be used to improve MAB program implementation in the Arab region? by **reaching Objective 10:** O10. Developing specific recommendations on using the research findings to improve BR concept implementation and management effectiveness in the Arab region.
OVERARCHING RESEARCH QUESTION IS ANSWERED, RESEARCH AIM ACHIEVED	

CHAPTER 2: LITERATURE REVIEW

This Chapter presents a review of the main literature underpinning this research. The first part provides adopted definitions and justifications of important concepts used throughout the research. This is followed by a general review of the PA management effectiveness discourse evolution and major MEE tools. The second part of the Chapter focuses on BRs and provides a deeper understanding of the BR concept evolution, its global organization, governance, management and evaluation using the PR process. The evolution of the PAME and BR evaluation discourses are then summarized and characterized in a parallel analysis, before moving to the final part of the Chapter that presents the Arab region's important characteristics in relation to the study.

2.1 Concepts definitions

2.1.1 Protected area

The most widely adopted definition of a PA is the one developed by the International Union for Conservation of Nature (IUCN) at the IVth World Congress on National Parks and Protected Areas in 1992: "an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means" (IUCN 1994, 2). This definition is used by the UNEP and WCMC as a basis for recording PA global information in the WDPA. In 2008, IUCN redefined a PA as "a clearly defined geographical space recognized, dedicated and managed, through legal or other effective means to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley 2008, 8), therein introducing a measure of management effectiveness. Another popular definition of a PA is the one developed by the CBD, hence recognized by all 195 parties (168 signatories) of the Convention: "a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives" (CBD 2015).

All mentioned definitions agree on the following criteria of a PA: (1) defined space with boundaries, (2) regulation or other effective means, (3) management, (4) specific conservation objectives, and (5) unspecified time-line. However, the IUCN 2008 definition (Dudley 2008) will be adopted in the context of this research because it applies better to the BR concept, which incorporates goals related to sustainable development (ecosystem services), as well as protection of cultural values in addition to conservation of biodiversity values.

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2.1.2 Management effectiveness

In the context of protected areas, management effectiveness is defined in reference to three aspects: "design issues relating to both individual sites and protected area systems; adequacy and appropriateness of management systems and processes; and delivery of PA objectives including conservation of values." (Hockings *et al.* 2006: xiii). Detailed definitions of the three aspects mentioned above are provided below (Hockings *et al*. 2004: 159):

Design/Planning considers how design issues such as the size and shape of protected areas; the existence and management of buffer zones and links between protected areas, affect the capacity of sites to achieve their stated function. Design failures can, for example, lead to problems of protected areas that are too small to be effective, fragmented, and fail to provide capacity to adapt to environmental change. Planning considers the existence and adequacy of planning undertaken for the protected area(s).

Adequacy/Appropriateness addresses how management is resourced and conducted. This component considers both whether there are sufficient management resources and whether management processes and actions are appropriate. Management failures therefore range from complete lack of implementation (so-called `paper parks') through to strategic errors about where to focus effort or how management is conducted.

Delivery assesses whether protected areas are achieving their stated objectives. Measures include both biological elements (such as whether key species are surviving, recovering or declining) and socio-economic aspects (such as recreational use or the attitudes and behavior of local human communities towards the protected area).

With this understanding, MEE is defined as: "the assessment of how well the protected area is being managed – primarily the extent to which it is protecting values and achieving goals and objectives." (Hockings *et al.* 2006: xiii).

2.1.3 Biosphere reserve

The BR concept has significantly evolved since it was first formulated early 1970s with the launch of the MAB program by UNESCO. The concept has been shifting from a conservation

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focus towards more inclusion of human settlements and sustainable development[6] activities (Ishwaran and Persic 2008). In 1984, the vision of BRs was delineated as "protected areas of representative terrestrial and coastal environments which have been internationally recognized for their value in conservation and in providing the scientific knowledge, skill and human values to support sustainable development" (UNESCO 1984). The current official website of UNESCO-MAB comprises elaborate explanations of the BR concept and vision in practice. The main defining characteristics emphasized include (UNESCO 2014a):

- "Biosphere reserves are areas of terrestrial and coastal ecosystems that promote solutions to reconcile the conservation of biodiversity with its sustainable use.
- BRs are internationally recognized, nominated by national governments and remain under sovereign jurisdiction of the states where they are located.
- Biosphere reserves serve as 'living laboratories' for testing and demonstrating integrated management of land, water and biodiversity.
- Collectively, BRs form a world network: the World Network of BRs (WNBR). Within this network, exchanges of information, experience and personnel are facilitated."

The BR concept is built on a zoning system, which consists of a legally protected core area surrounded by buffer and transition zones (not specifically with legal protection). In the 1995 Seville Strategy, the three complementary functions of a BR, which are linked to the zoning scheme into "functional zoning", have been defined as:

> "...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).

The multitude of definitions and descriptors of a BR, and the absence of one standardized and specific definition with clear management prescriptions indicates relative vagueness in the concept, which could create multiple interpretations. Nevertheless, the stated definitions

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[6] In the UNESCO-MAB program context, the term *sustainable development* designates eco-friendly socio-economic development of local communities, and is discussed separately from the conservation of nature. Though other definitions of *sustainable development* define it as integrative of the 3 aspects of *social* equity, *economic* development, and *environmental* protection aspects (Kates *et al.* 2005), this dissertation adopts the MAB designation of sustainable development as socio-economic development that is harmless to natural resources, and separates it from environmental conservation in the narrative as well as the methodology (indicators, criteria etc.).

provide a general understanding of the BR structure and objectives. BR characteristics will be elaborated in more detail when the BR concept evolution is presented later in this Chapter.

2.2 Protected area management and evaluation

2.2.1 Protected area management effectiveness

Between 1990 and 2012, the world's protected areas increased by 58% in number, and 48% in extent (Bertzky *et al.* 2012). By 2014, the world land coverage had expanded from <9% (1990) to 15.4%, while marine coverage increased from <2% (1990) to 8.4% (Juffe-Bignoli *et al.* 2014). However, since the rising number and spatial coverage of PAs worldwide as a strategy for biodiversity conservation did not always translate into better conservation results, more attention has been drawn to protected sites that are failing to maintain biodiversity values, referred to as "paper parks" (Brandon *et al.* 1998; Bruner *et al.* 2001; Stoll-Kleemann *et al.* 2008). As part of finding solutions for improving *in-situ* conservation, the management effectiveness discourse was initiated and first structured around a Management Effectiveness Task Force in 1995 put forth by IUCN's World Commission on Protected Areas (WCPA). Although management effectiveness assessment and improvement does not necessarily lead to improved conservation outcomes (Juffe-Bignoli *et al.* 2014; Carranza *et al.* 2014), it has become a requirement of the CBD and an established priority in international conservation agendas, as highlighted by IUCN's statement: "Many protected areas around the world are not effectively managed. In response, management effectiveness will continue as a priority with a focus on improving on and learning from past approaches" (IUCN-WCPA 2009, 1); and iterated in the CBD and Protected Planet reports (Section 1.1.1).

Gradually, many initiatives were taken towards this end, for example as part of the 7th CBD Conference Of the Parties (COP7) Program of Work for Protected Areas (PoWPA), nations have committed to develop assessment systems to report on PA effectiveness for 30% of their PAs by 2010, a requirement of the CBD at that time (WWF 2007). At a later phase, during the CBD/COP8 meeting, the delegates reviewing the first PoWPA implementation phase highlighted the need to improve PA management effectiveness by tackling the following underlying issues: lack of financial resources; lack of technical assistance and capacity-building for PA management staff; poor governance; political, legislative and institutional barriers (UNEP 2006; SCBD 2009). Recently, the CBD became more stringent on MEE by inviting each signatory country to implement and report MEE results for 60% (spatial coverage) of their

established PAs by 2015, which reflects a stronger focus on the importance of management effectiveness for reaching PA objectives (CBD 2010).

2.2.2 Protected area management monitoring

2.2.2.1 Background

In the perspective of addressing the underlying issues negatively affecting management effectiveness of PAs, international experts highlighted the need to create cost-effective evaluation tools for monitoring progress towards PA management objectives. As highlighted in the Durban Congress recommendations: "New methodologies to assess management effectiveness should be developed to address the specific gaps identified […] including rapid, site level assessments of both management effectiveness and threats" (IUCN 2005, 92). Actions taken in this perspective include the development by the IUCN-WCPA of a Protected Areas Program, which partially aims at providing capacity-building to PA management institutions through the provision of guidance, tools and other information, and a vehicle for networking (IUCN-WCPA 2009).

2.2.2.2 Management monitoring concept and challenges

Monitoring has been best described as "the collection and analysis of repeated observations or measurements to evaluate changes in condition and progress toward meeting a management objective" (Elzinga *et al.* 2001; Tucker 2005, 24). Applied to conservation projects (Salafsky *et al.* 2001b; Tucker 2005), monitoring involves a continuous evaluation of progress towards project goals and preservation of the intrinsic value of species from internal or external threats (Margules and Pressey 2000). Monitoring is an essential part of *conservation systematic planning* as it constitutes the last of its six stages defined by Margules and Pressey (2000). At the level of monitoring conservation area management, there is a fundamental debate on the best indicators to be used (Margules and Pressey 2000; Margoluis and Salafsky 2001). Indicators can be generally grouped in two categories: biological indicators and management indicators. Although these are best used complementarily, a comparison of these two types of indicators has proven that management indicators are easier and more cost-effective and efficient to use compared to biological indicators. Biological indicators have been reported as being far more complex to measure and interpret, and often very costly (Margoluis and Salafsky 2001; Anthony 2008). On the other hand, the most commonly reported problem of monitoring programs is the collection of too much data that is not tied to PA management needs, which makes them irrelevant to key management questions (Tucker 2005; Tucker *et al.* 2005).

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Consequently, it is essential to develop and apply monitoring plans <u>after</u> clearly defining PA management objectives (Margules and Pressey 2000; Tucker 2005; Tucker *et al.* 2005).

2.2.3 Management effectiveness monitoring tools

As demonstrated above, the need for effective evaluation/monitoring methodologies and tools to assess progress towards general management objectives of PAs was identified and increasingly highlighted. In response, a general framework to support the development of such evaluation tools was created by IUCN-WCPA. Since the WCPA Framework only provided guidelines for the creation of PAME evaluation tools, this translated into the development of several methodologies adapted to site specifications at regional or local levels. More than 50 MEE methodologies have been recorded in the most recent global review conducted by Leverington *et al.* (2010b). The most widely recognized and adopted ones worldwide are presented in this Section.

2.2.3.1 World Commission on Protected Areas (WCPA) Framework

The IUCN-WCPA Management Effectiveness Task Force responded to the need for management effectiveness tracking tools by developing in 1997 a framework that aims at providing overall guidance in the development of more adapted assessment systems, and encourage the presence of standards for assessment and reporting (Hockings *et al.* 2000; WWF and WB 2003). The WCPA Framework was developed based on the consideration that site performance mostly depends on six influential factors*: context, planning, input, processes, outputs,* and *outcomes* (Table 2).

Table 2: Summary of the WCPA Framework

Element	Explanation	Criteria assessed	Focus
Context	*Where are we now?* Evaluation of importance, threats and policy environment.	Significance Threats Vulnerability National context Partners	Status
Planning	*Where do we want to be?* Evaluation of protected area. Design and planning.	Protected area legislation and policy Protected area system design Management planning	Appropriateness
Input	*What do we need?* Evaluation of resources needed to carry out management.	Resourcing of agency Resourcing of site	Resources
Processes	*How do we go about it?* Evaluation of the way in which management is conducted.	Suitability of management actions	Efficiency & appropriateness
Outputs	*What were the results?* Evaluation of the implementation of management programs and actions. Delivery of products and service.	Results of management actions Services and products	Effectiveness
Outcomes	*What did we achieve?* Evaluation of the outcomes and the extent to which they achieved objectives.	Impacts/effects of management in relation to objectives	Effectiveness & appropriateness

Source: Adapted from Hockings *et al.* 2004

The WCPA Framework is built around the theoretical PA Management and Assessment cycle, presented in Figure 3.

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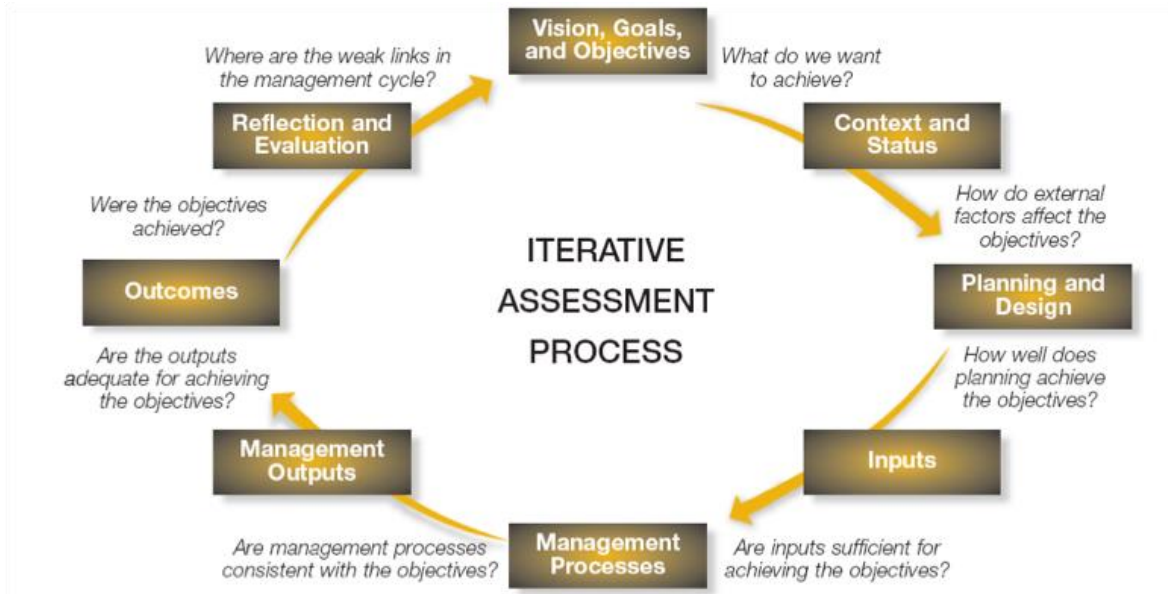
Fig. 3: Protected area management and assessment cycle
Source: Ervin 2003, adapted from Hockings *et al.* 2000

Briefly, this cycle starts by an understanding of the context and status of values, including threats around the PA. It then progresses through planning, allocating resources, and processing management actions, which results in products and services that have a final impact on management objectives (Hockings *et al.* 2000; Stolton *et al*. 2003). The WCPA Framework also stresses the importance of establishing clear, measurable, and outcome-based objectives as a basis for the whole management process and for better monitoring results (MacKinnon *et al.* 1986; Tucker 2005). The framework provides the first consistent approach to PA MEE, and has been used worldwide by experts and organizations to develop more specific assessment tools, the most widely used of which are detailed below.

2.2.3.2 Management Effectiveness Tracking Tool (METT)

The Management Effectiveness Tracking Tool (METT) was developed and published in 2003 based on the WCPA Framework (Stolton *et al.* 2003). It was created to help the WWF-WB Alliance in monitoring progress towards achieving their management effectiveness target for forest PAs: "75 million hectares of existing forest protected areas under improved management to achieve conservation and development outcomes by 2010" (WWF 2007, 2). The METT was not designed to be the sole tool for monitoring of PA management effectiveness but rather to complement more thorough assessment methods as part of adaptive management. The tool has later been adopted by other organizations such as the Global Environment Facility (GEF), and modified by others to be applied to marine and wetland reserves. An updated version

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incorporating the modifications made over time after worldwide experience by several countries was released in 2007 (WWF 2007).

The methodology consists of a rapid assessment based on a scorecard questionnaire that includes the six elements of management as defined by the WCPA Framework. It is simple to use, and provides a mechanism for monitoring progress towards more effective management over time. It is used to enable stakeholders to identify needs and obstacles, and prioritize actions to improve the effectiveness of PA management (WWF 2007). The METT instrument is administered in two parts: datasheets and an assessment form.

- Datasheets: There are two datasheets. The first datasheet records basic information about the site, and assessment details. The second datasheet asks assessors to identify threats, and rank their impact on the PAs.

- Assessment Form: briefly, the assessment is based on 30 questions presented in a table with three columns that should be completed for recording details of the assessment. As part of the assessment, a score should be assigned to each question ranging from 0 (poor) to 3 (excellent).

One of the major disadvantages of this tool is that the score obtained doesn't allow for comparison of management effectiveness across sites, since it is only designed to track the progress of one site (WWF 2007). Another limitation is that METT doesn't allow for detailed evaluation of outcomes: instead it provides a rapid on-site evaluation of progress in management steps (WWF 2007). Moreover, although METT provides a quantitative result in the form of a final score, which might be considered a positive aspect of the tool, the system of "scoring" progress is "fraught with difficulties and possibilities for distortion" (WWF 2007, 7). For example, the scoring system assumes that all 30 questions deal with issues of equal weight, whereas some parts of the questionnaire may deserve a higher weight than others (e.g.. condition of biodiversity) (WWF 2007; Anthony and Shestackova 2015).

2.2.3.3 Rapid Assessment and Prioritization of Protected Area Management (RAPPAM)

Another tool developed based on the WCPA Framework is the Rapid Assessment and Prioritization of Protected Area Management (RAPPAM) methodology created by WWF between 1999 and 2002 (Ervin 2003). The tool's main purpose is the prioritization of budget allocations for the PA system based on PA management needs (Ervin 2003). It consists of a Rapid Assessment Questionnaire that covers all elements of the WCPA Framework with more

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focus on two areas: contextual issues/threats and management effectiveness as reflected in Figure 4 (Ervin 2003).

Fig. 4: Elements of the WCPA Framework in the Rapid Assessment Questionnaire
Source: Ervin 2003, 5

Important outputs of RAPPAM include lists of the most common threats, management strengths and weaknesses, prioritization of PAs with respect to their vulnerability, and other comparative data on studied aspects of management. Threats typically include:

▪ Past pressures: forces, activities, events that have already negatively impacted the integrity of the PA (e.g. legal or illegal activities).

▪ Future threats: potential pressures likely to cause a detrimental impact to occur and maybe persist.

The scoring system used in RAPPAM consists of a selection scale (no=0, mostly no=1, mostly yes=3, yes=5), where 'yes' reflects an ideal situation. Threats are rated according to two main criteria: trend and severity including extent, impact and prevalence (Ervin 2003).

The main limitation of RAPPAM is the subjectivity in assigning scores since it is mainly perception-based and qualitative in nature (Ervin 2003). On the other hand, RAPPAM is most effective when conducted in a series of workshops (over 2-3 days) with interactive participation of a wide range of stakeholders: government authority, direct management staff, administrators, policy makers and local communities. This could be a limitation as well since it could make the process complicated, unpractical and time-consuming, depending on the context.

2.2.3.4 Threat Reduction Assessment (TRA)

The METT and RAPPAM approaches both include an assessment of threats and vulnerability. However, the Threat Reduction Assessment (TRA) method created by Salafsky and Margoluis

(1999) provides a more focused approach concentrating on direct threats to conservation and to the protected area system (Margoluis and Salafsky 2001; Tucker 2005). The TRA method is based on the concept that monitoring threats to the achievement of the targeted state of biodiversity can provide an indirect measure of conservation success (Tucker 2005). TRA is used as part of adaptive management to orient and define actions to be taken in order to improve the conservation project success. These actions typically relate to policy development and implementation, regulation, governance, funding or other indirect factors impacting PAs (Margoluis and Salafsky 2001; Salafsky *et al*. 2002).

The TRA tool has many advantages compared to previously mentioned methods:

- It produces one quantitative result (TRA Index) expressed as a percentage, which reflects performance of management in reducing threats as part of their management objectives over a defined period of time.

- The TRA Index scores can be used to monitor changes within one area if TRA is applied regularly. It can also be used to compare performance across many PAs if other conditions are similar (same project, time frame, etc.).

- It is simple and practical. TRA is easier to use, less time-consuming and more cost-effective than more comprehensive approaches as it requires minimal resources and can be done through one session with the stakeholders most knowledgeable about the site.

- It is more concise and focuses on one aspect of management effectiveness (threats) with great impact on biodiversity, which creates more opportunity to make improvements on that specific area compared to making regular general assessments.

However, the TRA is not suited for comprehensive MEEs and has its own number of weaknesses, which include the subjectivity in assessing score rankings and "threat reduction scores" that can largely rely on qualitative estimation by participants (Margoluis and Salafsky 2001; Persha and Rodgers 2002; Tucker 2005).

Modifications have been made to improve the TRA method and reduce its disadvantages. First, subjectivity can be partially or fully eliminated by supporting the "threat reduction score" with other quantitative data and supporting evidence on changes "claimed" by evaluators. Second, a modified version of the TRA tool (mTRA) that incorporates a negative score has been tested in South Africa (Anthony 2008), Lebanon (Matar and Anthony 2010), Mongolia (Ganbaatar 2011), Ukraine (Kovalenko 2012), and Ghana (Anderson 2012). This negative score incorporates the worsening of threats or appearance of new threats and its level of increase

during the evaluation period, and allows for a more representative assessment of real-life situations where threats can increase (Anthony 2008).

2.2.3.5 Common Reporting Format (CRF)

A global study has recently reviewed around 8000 PAME worldwide assessment results using different tools (Leverington *et al.* 2010b). One outcome of this global study was the development of a Common Reporting Format (CRF) composed of 33 Headline Indicators (HI), which can be found in most PAME evaluation tools. More specifically, these indicators were developed using a "bottom-up" approach drawing from a review of 2000 questions and indicators from more than 50 different PAME evaluation methodologies (Leverington *et al.* 2010b). These indicators are grouped into the six categories delineated by the WCPA Framework, and provide the first attempt to create a standard common format for assessing and reporting PAME evaluation results globally (Table 3).

Table 3: PAME Common Reporting Format - Headline Indicators

Element	Headline Indicator (HI)
Context	Level of significance
	Extent and severity of threats
	Constraint or support by external political and civil environment
Planning	Protected area gazettal (legal establishment)
	Tenure issues
	Adequacy of protected area legislation and other legal controls
	Marking and security or fencing of park boundaries
	Appropriateness of design
	Management plan
Input	Adequacy of staff numbers
	Adequacy of current funding
	Security/reliability of funding
	Adequacy of infrastructure, equipment and facilities
	Adequacy of relevant and available information for management
Process	Effectiveness of governance and leadership
	Effectiveness of administration including financial management
	Management effectiveness evaluation undertaken
	Adequacy of building and maintenance systems
	Adequacy of staff training
	Staff/other management partners skill level
	Adequacy of human resource policies and procedures
	Adequacy of law enforcement capacity
	Involvement of communities and stakeholders
	Communication program
	Appropriate program of community benefit/assistance
	Visitor management (visitors catered for and impacts managed appropriately)
	Natural resource and cultural protection activities undertaken
	Research and monitoring of natural/cultural management
	Threat monitoring
Outputs	Achievement of set work program
	Results and outputs produced
Outcomes	Conservation of nominated values—condition
	Effect of park management on local community

Source: Adapted from Leverington *et al.* 2010b

The objectives of developing the CRF are to:

- "represent most indicators found in any MEE methodology;
- provide a platform for cross-analysis of results from MEE studies using different methodologies, while maintaining as much information as possible;
- be flexible, with the potential to add more 'headline indicators' in the future;
- have a common set of indicators to report to the CBD" (Leverington *et al.* 2008, 20).

Drawing from the results of the 3184 most recent PAME assessments conducted worldwide, Leverington *et al.* (2010b) calculated headline indicator scores on a scale from 0 to 1 using an arbitrary categorization of scores with only relative meaning, as follows: "the scores reflect a continuum from no management at all to reaching the highest standards. The lowest third (below 0.33) means that protected area management is likely to be seriously constrained. Scores between 0.33 and 0.67 indicate that while basic management is in place, considerable improvement is still needed. Generally a 'sound' level of management would begin at a score of around two-thirds (0.67). Scores above this mean that the area is being managed relatively well." (Leverington *et al.* 2008, 28). Analysis showed that only 13% of PAs were in the "clearly inadequate" range (average score <0.33), 22% were in the "sound management" range (>0.67), while most PAs were clustered in the middle third (basic management), with 28% of the total in this range below 0.5 (major deficiencies) and 37% above 0.5 (Leverington *et al.* 2010b).

2.2.3.6 Weaknesses of protected area management effectiveness evaluation tools

The PAME tools presented above are all used for summative evaluations based on indicators, and therefore share some inherent weaknesses (Anthony and Shestackova 2015). Three main criticisms have been debated and documented in literature. The first pertains to the absence of a systematic weighting approach that would: (1) assess the importance and relevance of each indicator to the specific context of the PA evaluated, and (2) account for the different weights when calculating/analyzing PAME results (Anthony and Shestackova 2015; Ervin 2003; Hockings *et al.* 2015; Leverington *et al.* 2010b; Nolte *et al.* 2010; Zimsky *et al.* 2012). The impact of "not weighting indicators" on overall evaluation results, and on comparative analysis has been tested in a PAME study on 27 PA sites in Russia and proved to be confounding to the analysis of results (Anthony and Shestackova 2015). This provides additional evidence for incorporating weighting systems to PAME tools in the perspective of better adapting them to the local situation and making them more congruent with the idiosyncrasies of the PAs' regional context.

A second criticism of the PAME tools highlights the importance of using these management evaluation tools in combination with biological monitoring tools- especially for sites managed primarily for conservation- for assessing the conservation outcome. As mentioned in the literature review (Section 2.2.2.2), MEE tools are faster, cheaper and easier to implement compared to biological monitoring. However, using them as a proxy for measuring conservation success has proven to be misleading in many studies involving METT and

RAPPAM (Nolte and Agrawal 2013; Nolte *et al.* 2013, Carranza *et al.* 2014). This leads to the third important criticism, which highlights the importance of adapting the tool to the management objectives (e.g.. IUCN PA category). Anthony and Shestackova (2015) point at the need to decouple *outcome* indicators from both the overall PAME evaluation score, and from the combined score of outcome indicators. This argument is made based on evidence from several studies that outcome indicators' scores do not necessarily correlate (largely and positively) with overall effectiveness scores (Leverington *et al.* 2010b), and that different indicators are not consistent in correlating with the different outcomes (Anthony and Shestackova 2015).

Criticisms of PAME tools have been used in many instances to learn and improve their use. Hence, they have been modified at times to improve their effectiveness in measuring what they are designed to measure. For example, the mTRA incorporated some changes to produce an "enhanced" version of the TRA method (Anthony 2008) (Section 2.2.3.4). Moreover, as new studies incorporate the use of refined tools, more evidence will be available for experts to improve and adapt the tools used locally to the context, needs, and resources available for PA evaluation.

After defining the main concepts of relevance to this study, and reviewing PA management and MEE literature, the second part of this Chapter will focus on BRs and provide a comprehensive review of their evolution, characteristics, management and evaluation.

2.3 Biosphere reserves

2.3.1 Background

Finding an appropriate balance between strict conservation of biodiversity and the development of surrounding communities has been the subject of several conservation studies and debates, which led to the development of community-based and other participatory management approaches for protected areas. In response, UNESCO developed the MAB program to establish a scientific basis for the improvement of relationships between people and the environment, addressing problems such as the rational use and conservation of natural resources, and ecologically sound land use (Batisse 1986; Bioret *et al.* 1998).

Established under the MAB Program, BRs are protected sites intended–to reconcile the conservation of biodiversity with its sustainable use, towards sustainable development

(UNESCO 1996). Although the central goal of BRs is the protection of biodiversity, they differ from other protected areas such as national parks and wilderness areas by accepting human settlement as a feature of the landscape, and by having a three zone scheme composed of a central core area of high biological value, and surrounding buffer and transition zones where relatively increasing human activities take place (Bioret *et al.* 1998). Unlike most strict conservation areas, stakeholders and interest groups affected by the reserve may be involved in planning the BR's design and management. This participation is aimed at gaining long-term community support for the reserve and commitment to its success in reaching its outcomes.

2.3.2 The World Network of Biosphere Reserves (WNBR)

The first designations of BRs occurred in 1976 (Batisse 1986; Schultz *et al.* 2011). The number increased rapidly since then, and the World Network of BRs (WNBR) already counted 324 in 82 countries in 1995, 531 in 105 countries in 2008, and recently reached 631 in 119 countries (UNESCO 1996; UNESCO 2014a). While BRs have a global designation by UNESCO, they remain under the jurisdiction of the States where they are located (UNESCO 2014a).

The MAB program leverages two types of networks to fulfil its mission through the exchange of knowledge and experience regionally and internationally: the regional and sub-regional MAB networks on one hand, and the ecosystem-based networks on the other. Regional networks include: (1) AfriMAB for Africa, (2) IberoMAB for Latin America and the Caribbean, (3) EuroMAB for Europe and North America, (4) four different regional networks for Asia and the Pacific, and (5) ArabMAB for the Arab States. These networks are created to foster regional collaboration on the basis of common regional features (cultural, natural, political etc.). On the other hand, ecosystem-based networks bring together BRs with common geological and natural features and provide sites for regional or international research, capacity-building or educational collaboration (UNESCO 2014a). One example is the network of mountain BRs, which have been emphasized by UNESCO-MAB as appropriate sites for pilot-testing or studying the effects of global change including urban development and climate change adaptation and mitigation on vulnerable ecosystems such as mountains (UNESCO 2014a).

2.3.3 Biosphere reserve concept and program evolution

Recent definitions of BRs by UNESCO-MAB include:

> *"areas comprising terrestrial, marine and coastal ecosystems. Each reserve promotes solutions reconciling the conservation of biodiversity with its sustainable use"*.

"Science for Sustainability support sites' – special places for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity." (UNESCO 2014a).

However the BR concept and definition has been revisited several times since 1971. It has generally evolved in three main phases chronologically outlined in the Sections below. These phases are defined by two landmark meetings: the Seville conference in 1995, which resulted in the important *Statutory Framework and Seville Strategy*, and the Madrid meeting in 2008, which resulted in the *Madrid Action Plan (MAP)*. These documents constitute to date the main governing documents of the MAB program of work. A fourth phase is now in progress whereby a new MAB strategy has been adopted for the next decade (2015-2025) (Section 2.3.3.4).

2.3.3.1 Phase 1: From the beginning until the Seville meeting (1971-1994)

The early definitions of the BR concept include a theoretical reference to three main functions:

- Conservation: BRs incorporate representative ecosystems with important conservation value.
- (Sustainable) Development: promoting sustainable human and economic development.
- Logistic support: providing logistic support for scientific research, monitoring, and environmental education and training.

The three functions were conceived to be associated with three concentric zones inside the BR. The conservation function was envisioned to be fulfilled by the core area, which would be a strict conservation zone with clear boundaries, surrounded by a strictly delineated buffer zone where only non-destructive controlled activities would be allowed including research and monitoring (IUCN 1987), and a wider flexible transition zone where a broad range of sustainable activities would take place such as agriculture, and traditional use practices.

Although these three functions were clearly stated, the early designations of BRs by UNESCO were mainly based on existing protected areas with important conservation value and good potential for research (Batisse 1986; Price 2002). This resulted in a "neglect" of the sustainable development role of BRs and a weak implementation of the three-zone concept until the Seville meeting in 1995 (Batisse 1986; Price 2002; UNESCO 1996). Only 23% of BRs designated between 1976 and 1984 applied the three zones scheme, 65% designated during 1985-1995; while up to 98% of BRs applied the scheme after 1995 (UNESCO 2008, 9). The concentric zones model has also not been strictly implemented due to contextual limitations (UNESCO

1996). After the Rio Summit in 1992 and the adoption of the Convention on Biological Diversity by more than 100 countries, the sustainable development role of BRs was reinforced.

2.3.3.2 Phase 2: From the Seville meeting to Madrid's (1995-2007)

In 1995, the Seville Strategy and Statutory Framework (UNESCO 1996) redefined the three zones scheme in light of the past 20 years of experience. As a result, the strict concentric model of "3 zones-3 functions" was replaced by the concept of "functional zones", which was more realistically applicable:

- Core area: each BR can have more than one core area, which constitute conservation areas protected by national legislation. These areas would represent undisturbed ecosystems and habitats of important species, and would provide for research and monitoring and some education.

- Buffer zone: surrounds the core area(s) and provides a space for sound ecological practices, sustainable activities such as ecotourism and education, and basic research.

- Transition zone: one co-operative zone which surrounds the core and buffer areas and includes a wider range of human activities with many stakeholders and institutions involved in their sustainable management (Fig. 5).
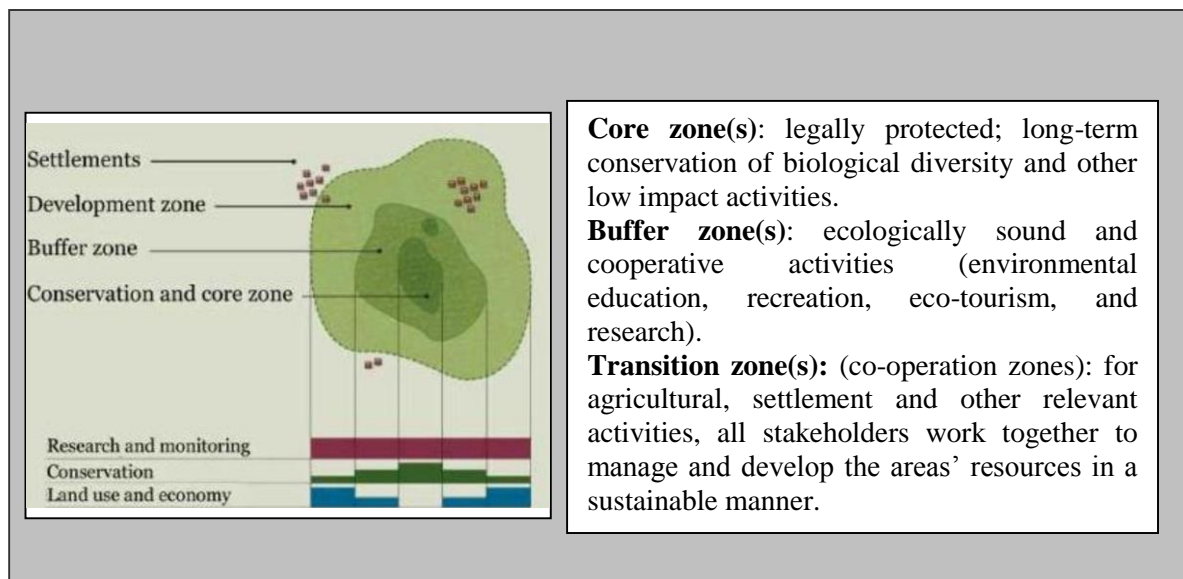
Fig. 5: The three integrated functional zones of BR(s)
Source: https://floodmaster.hydro.tu-dresden.de/wiki/Saturday_25_September_2010

Thereby, the Seville Strategy marked a shift toward more flexibility and integration of zones and functions. Better harmonization and interaction between the different zones was essential through ensuring the presence of management tools and institutions (UNESCO 1996). In

addition, selection criteria, management planning and PR reporting policies were created within the new strategy as tools to ensure the successful fulfilment of the three functions of BRs (UNESCO 1996; Price 2002) of which the definitions were refined in Article 3 of the Statutory Framework as follows:

> **"conservation-** *contribute to the conservation of landscapes, ecosystems, species and genetic variation;*
> **development**- *foster economic and human development which is socio-culturally and ecologically sustainable;*
> **logistic support**- *support for demonstration projects, environmental education and training, research and monitoring related to local, regional, national and global issues of conservation and sustainable development*" (UNESCO 1996, 16).

2.3.3.3 Phase 3: Madrid meeting and outcomes (2008-2014)

In March 2008, during the 3rd World Congress on BRs in Madrid, the BR concept was presented as a "learning site for sustainable development" (UNESCO 2008) capitalizing more on the logistic support and development functions. More attention was given to the buffer and transition zones and their roles to promote BRs as model sites for sustainable development. A new requirement to have boundary delineation for the transition zone was created while increasingly more flexibility in the integration of functionalities was fostered (UNESCO 2008). Hence, the period after the Madrid meeting is characterized by stricter requirements from UNESCO on BR zone delineation, and management reporting. In contrast, more flexibility is granted in integrating the three functions into the different zones (i.e. each of the 3 zones can serve the 3 functions to a different degree) (Fig. 5).

It is important to note – in the perspective of MAB evolution- that the mission of MAB during this period was to

> *"maintain and develop ecological and cultural diversity while securing ecosystem services for human well-being through sound research and collaboration with a sustainable range of actors, often including local communities and scientists"* (UNESCO 2008).

The meeting resulted in a milestone document called the Madrid Action Plan (MAP), which builds on the Seville strategic directions and aims at raising BRs to be the foremost international sites dedicated for sustainable development in the 21st century (UNESCO 2008).

The plan defined 31 targets with their related 64 actions, indicators and responsible parties, along four main themes:

1. Cooperation, management and communication: Targets 1-11
2. Zonation and linking functions to space: Targets 12-14
3. Science and capacity enhancement: Targets 15-24

4. Partnerships: Targets 25-31 (UNESCO 2008).

2.3.3.4 Phase 4: Development of a new MAB Strategy (2015-2025)

The beginning of a new phase for the MAB program was marked by UNESCO's Internal Oversight Service (IOS) (Evaluation Section) comprehensive and *Final Evaluation of the Madrid Action Plan for BRs* completed in May 2014 (UNESCO 2014d). The results of this internal review provided input for the new 2015-2025 MAB strategy (UNESCO 2015a) distributed to all MAB National Committees in its final version on 4th of May 2015 and adopted by the ICC 27th Session in June 2015 (Ramadan-Jaradi pers. comm.). The 2015-2025 MAB strategy incorporates an Action Plan that may be adopted in the ICC's 28th Session in 2016 (Ramadan-Jaradi pers. comm.).

The recent strategy (2015-2025) gives a new strategic direction to the WNBR by positioning the MAB program as a key contributor to the overall UNESCO plan of shaping scientific research agendas and reaching global sustainability goals (UNESCO 2015a). More specifically, the MAB program is foreseen to support UNESCO's sought contribution in fostering global and regional scientific cooperation for the fulfilment of the post-2015 development agenda. Hence, the WNBR is now considered one of UNESCO's instrumental tools to support the transition to green economies by providing experimentation sites for green development.

The overall MAB mission was revisited to integrate this new strategic direction, and is now stated as:

> "*Our mission is to inspire a positive future by connecting people and nature today. Over the next 10 years and beyond, the MAB Programme will assist Member States 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)

In that perspective, four new strategic objectives have been drafted:

> "*1. Conserve biodiversity, restore and enhance ecosystem services and foster the sustainable use of natural resources*
> *2. Contribute to building sustainable, healthy and equitable societies, economies and thriving human settlements*
> *3. Facilitate sustainability science and education for sustainable development*
> *4. Support mitigation and adaptation to climate change and other aspects of global environmental change.*" (UNESCO 2015a, 7)

The updated mission and objectives set by UNESCO for the MAB program, emphasize the role of BRs in achieving recent global sustainability goals.

2.3.4 Biosphere reserves governance

2.3.4.1 International governance

The International Coordinating Council of the MAB program -referred to as ICC or *MAB Council*- is the main MAB governing body. It is formed of 34 Member States elected every 2 years by UNESCO's General Conference. As defined by UNESCO, the role of the *MAB Council* is to:

- "guide and supervise the MAB program;
- review the progress made in the implementation of the program (cf. Secretariat report and reports of MAB National Committees);
- recommend research projects to countries and make proposals on the organization of regional or international cooperation;
- assess priorities among projects and MAB activities in general;
- co-ordinate the international cooperation of Member States participating in the MAB Program;
- co-ordinate activities with other international scientific programs;
- consult with international non-governmental organizations on scientific or technical questions" (UNESCO 2010, 10-11).

Moreover, the *MAB Council* decides on new designations of BRs and gives feedback and recommendations on PR reports (Section 2.3.6.2). During the ICC meetings, the Council elects a chairman and five vice-chairmen, which form the *MAB Bureau*.

Working side by side with the ICC, is the *International Advisory Committee for BRs* (IACBR). The IACBR is composed of twelve members appointed by the Director-General of UNESCO after consultation with the Member States and/or the National Committees. It is responsible for advising the Director-General and the MAB-ICC on scientific and technical matters of relevance to nomination of new sites, as well as changes and PRs of existing sites. Finally, the *MAB Secretariat* based in UNESCO's headquarters supports the ICC and its Bureau (Stoll-Kleemann *et al.* 2008).

2.3.4.2 National governance

On a national level, *National MAB Committees* or *National MAB Focal Points* are appointed by Governments and play a major role in supporting the implementation of the MAB program. Every Member State has to establish an operational national committee that has the responsibilities of: (1) defining local priorities and programs of work to implement international MAB requirements and strategies; (2) ensuring maximal national participation in the international MAB program (UNESCO 2014a).

2.3.4.3 Local governance

One particularity of BRs is the multitude of stakeholders involved in and impacted by their establishment and management. Beyond the institutional arrangements made by UNESCO that provide a general institutional and governance framework (Sections 2.3.4.1, 2.3.4.2), the actual governance of BRs depends on and coincides with many legislative and strategic frameworks at many layers (national, sub regional, regional, international) (Stoll-Kleemann *et al.* 2008). Hence, it is of vital interest that "BRs coordination […] be considered in flexible coexistence with other forms of governance and government" (Stoll-Kleemann *et al.* 2008, 6). The complexity of the BR governance model has been reported to be a source of weakness to the successful implementation of the BR concept due to increased pressure on the BR management to align BR objectives and strategies with local, regional and international development strategies and governing policies (Schliep and Stoll-Kleemann 2010). Schliep and Stoll Kleemann (2010) provide an example of the complex multi-level governance environment of BRs (Fig. 6).
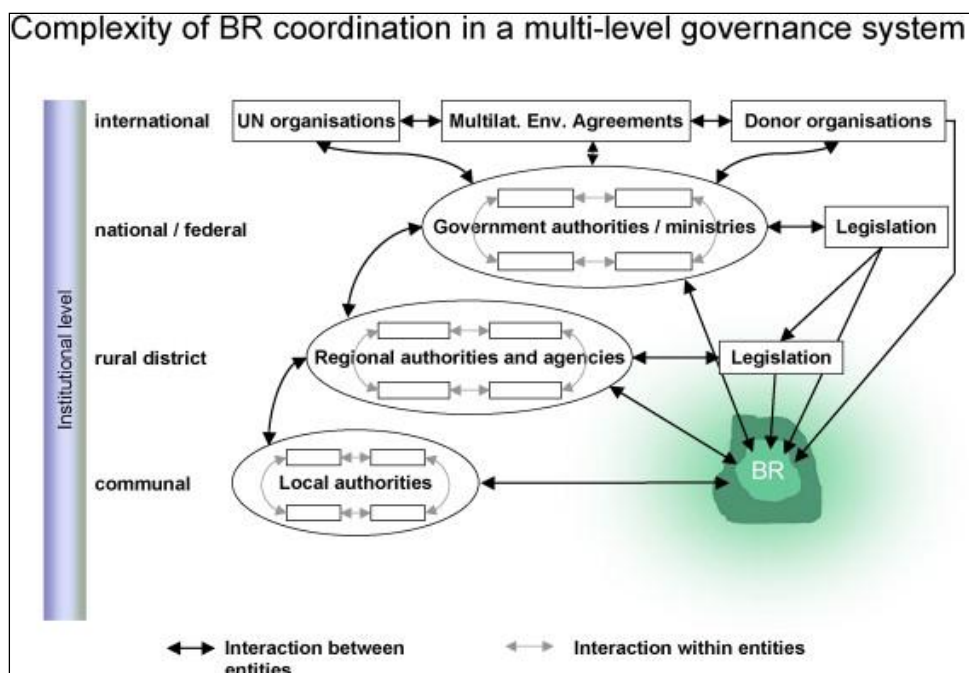
Fig. 6: Complexity of governance in which the BR operates
Source: Schliep and Stoll-Kleemann 2010

Local and regional characteristics of governance structures can have a great influence on BR management success. For instance, political support from local and national authorities plays an important role in securing funding for BR management, which is often a major impediment to effective BR management and can be the origin of other major conflicts. Other aspects of governance such as political stability, and the national conservation agendas have also been reported to have an important influence on implementation and success of BRs (Stoll-Kleemann 2005, 2007) (Section 2.3.5.2).

2.3.5 Biosphere reserve management

2.3.5.1 Characteristics of biosphere reserve management

The BR was the first "type of PA" that made the exploration of the relationship between conservation and development an explicit part of its definition, which was an innovative and rather revolutionary concept at the time of its inception (1971). This differentiating factor, in addition to other BR characteristics (Sections 2.3.1 - 2.3.5) have direct implications on its management as summarized in Table 4 based on literature (Bioret *et al.* 1998; Stoll-Kleemann *et al.* 2008; Stoll-Kleemann and Welp 2008; UNESCO 2010).

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Table 4: Major characteristics of BR(s) and their management implications

Characteristic	Description	Management Implications
1. A BR doesn't have its own legal status	The MAB label doesn't warrant any legal status to the BR, however there is a requirement that the core area be totally or partially granted some form of local legal protection before it becomes a BR. In some cases, a BR can be a PA in its entirety, or it might be made of one/several protected areas most frequently part of the core and buffer zones.	Several stakeholders are involved in the management of a BR. These include e.g. landowners, national and local authorities, Non-Government Organizations (NGOs), and communities. Hence, even in cases where there is one main managing institution (e.g. NGO), the management relies mostly on *collaborative* and *participatory approaches* between stakeholders.
2. A BR has a zonation system	(Section 2.3.3.2 and Fig.5 for a summary)	Management plans and structures should take into consideration the functional zones. Strategies and decisions elaborated for the core area will focus more on conservation of natural and cultural resources, while management activities in the buffer and transition areas will elaborate more on sustainable human activities and ecological corridors. Recently, more emphasis is being put on the transition zone as an area where the concept of *collaborative management* is of higher importance because of the generally greater number of stakeholders involved in that area.
3. A BR Manager is neither the owner nor the real manager of the BR territory	The BR includes a mixture of public and private lands, as well as patches of protected zones. Land managers and other decision-makers are part of the management process.	The role of the BR Manager becomes more concentrated on demonstrating to other stakeholders the benefit of adopting the BR concept. His/her responsibilities involve facilitation of the management process through dialogue between all actors.
4. Various structures can be established to implement the BR concept	The management structure in place is a direct function of the national legal status of the BR (or part of it). e.g.. National Park	Different: (1) legal powers, (2) national budgets, and (3) staffing possibilities, from governments apply to different management structures. These factors have direct implications on BR success (Table 5).

Characteristic	Description	Management Implications
5. BRs are organized in a network	There are directories and databases for BRs worldwide. An interactive online platform is being developed for enhanced communication.	Twinning and regional/international communication and cooperation are recommended. Best practices can be shared between BRs for improved management.

2.3.5.2 Globally identified factors of biosphere reserve success

After decades of implementation of the BR concept worldwide, a number of studies have been conducted to learn from this experience and have drawn major lessons and recommendations for improving success. One recent study entitled *The Governance of Biodiversity Project* (GoBi) was the first interdisciplinary study integrating ecological and socio-economic data to assess and identify important factors influencing success for existing management and governance approaches used in BRs internationally (Stoll-Kleemann 2005). The methodology of the GoBi research project is quite comprehensive and inclusive of many complementary methods: (1) archival review, (2) meta-analysis of case-study literature, (3) global survey, (4) detailed case-studies in BRs of South Africa, Thailand and Cuba, (5) expert interviews, (6) database analyses and fieldwork (Stoll-Kleemann 2005). Table 5 summarizes the main management activities and factors that impact success of BRs based on a qualitative analysis.

Table 5: Globally identified determining factors of success of BR(s)

Management activities	Governance factors
▪ Rural regional development measures	▪ Political support at the regional level
▪ Environmental education	▪ Appropriate funding
▪ Research and monitoring (long-term)	▪ Absence of corruption
▪ Locally adapted involvement of the population	▪ Modern nature conservation programs and laws
▪ Practical nature conservation measures like reforestation or the fight against erosion	▪ Absence of counterproductive and competing governmental programs
▪ Evaluation for an adaptive management	▪ Adequate institutional design; precise distribution of responsibilities between authorities
▪ Good working relations and cooperation with authorities	▪ Compensation for use restrictions
▪ Law enforcement (inter alia use of sanctions)	▪ Clear demarcation of borders
▪ 'Leadership'	▪ Local communities supporting the BR
▪ Sufficient (qualified) staff in the BR	

Source: adapted from Stoll-Kleemann 2007
Note: The lists in the two columns do not reflect a specific order of priority

As mentioned in Table 5, success factors for BR management include the existence of "Evaluation for adaptive management", which highlights the importance of applying adaptive management theory to BR management. In addition, it emphasizes the value of monitoring BR management performance in the aim of learning and adapting to new findings and continuously improving the management system (Schultz *et al.* 2011). These concepts will be more comprehensively presented in Chapter 3.

Though the results obtained in the GoBi study (Table 5) represent important internationally identified factors based on opinions of 167 surveyed experts (including BR managers), they do not reflect regional differences. Stoll-Kleemann (2005) mentions "obvious differences" between respondents from different regions (Africa vs. Latin America) in ranking the importance of the above-mentioned criteria. With this background, conducting research in specific regions would be of added benefit for devising more adapted recommendations to the local and regional contexts in which BRs are embedded.

2.3.6 Evaluations of MAB program and biosphere reserves

There is an important distinction to make between evaluating the MAB program, and evaluation of individual BRs. The following Section starts by presenting the evaluation of the MAB program conducted through assessing the Madrid Action Plan (MAP) implementation as the most recent strategic plan for the program. It then presents the literature concerning BR evaluation.

2.3.6.1 The Madrid Action Plan (MAP) evaluation

At a programmatic level, the MAB evaluation included evaluations of the implementation of the:

- Seville Strategy and Statutory Framework developed in 1995, reviewed in 2003, and evaluated in 2008-2009 based on the MAP requirements; and
- Madrid Action Plan (MAP) developed in 2008, which encompasses the implementation of the Seville Strategy. The MAP was evaluated in 2010, then in 2013. Hence, the Final Evaluation of the MAP implementation report is the latest appraisal of the "cumulative" achievements of the MAB program requirements (UNESCO 2014d).

The MAP final evaluation -completed in 2014- aimed at evaluating the level of implementation of these actions on an international level by the WNBR and devising recommendations for future strategies and actions. The study used mixed methods including (1) desk reviews, (2) online surveys to BR managers, national MAB committees and regional networks, and (3) self-assessments and conversations within the MAB Secretariat (UNESCO 2014d).

The evaluation resulted in 9 key findings, of which the most relevant to this research are quoted below:

- "A significant proportion of BRs and MAB national committees are disconnected from the WNBR.
- The BR concept lacks visibility and clear branding.
- Cooperation, management and communication has been consistently rated as the highest priority action area for the future. Within this action area, strengthening the capacities and resources for managing and governing BRs is consistently reported as the highest priority for the future." (UNESCO 2014d, 60-64).

2.3.6.2 Biosphere reserves evaluation: the periodic review process

- **Background**

Due to the continuous evolution of the BR concept throughout the MAB program implementation period (Section 2.3.3), the UNESCO-MAB Secretariat recognized the need to develop a mechanism that would help them and BR managers to monitor the gap between concept and practice by ensuring that BRs fulfilled their functions (Price 2002). This was especially applicable to the oldest BRs designated before Seville, to which softer requirements applied in terms of zoning, functions and local participation (Sections 2.3.3.1, 2.3.3.2). The need to develop a tracking system was recognized and made explicit in IUCN's evaluation of the 1984 BR Action Plan in preparation for the Seville meeting and highlighted that

> *"...there was no built-in way of evaluating performance and no standardized measure with which to evaluate the economic, social, and ecological progress made. Consequently, it becomes difficult to identify what constitutes "successful" implementation throughout the Network."* (IUCN 1995, 2; Price 2002, 551).

Another observation of IUCN's pre-Seville report is the fact that "approximately 50% of BRs consist of a national park with an additional buffer or transition zone" (IUCN 1995, 2; Price 2002). This point highlights the manner through which the BRs were formed in many places by simple overlap of BR areas on existing national reserves (Price 2002; Price *et al.* 2010), especially during the first period of the MAB program when the concept was still focused on conservation, research and education (i.e. before the consolidation of the triple function concept) (Price 2002; UNESCO 2014a). In addition, three main management challenges in relation to the actual implementation of the multi-functional concept of BRs were identified by IUCN's report (IUCN 1995; Price 2002): (1) shifting from traditional protected area management to more innovative multi-stakeholder management approaches needed for BRs; (2) lack of appropriate administration for implementing the triple functions of BRs; and (3) weak or absent enabling mechanisms for local community participation in decision-making.

- **The Periodic Review (PR) process**
  - ➢ <u>PR definition and aim</u>

In response to the identified need for the evaluation of BR concept implementation, the PR process was introduced in 1995 as part of Article 9 of the Statutory Framework adopted by the MAB ICC and general Conference of UNESCO:

"...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[7], and forwarded to the secretariat by the State concerned. The report will be considered by the Advisory Committee for BRs for recommendation to International Co-ordinating Council." (UNESCO 1996, 18).

Price (2002, 15) summarized the ultimate aim of the PR process to be that "BRs achieve the recognition as the sites of excellence that they should be". This would be achieved by ensuring "within a reasonable period, that all members of the WNBR do fulfil the three complementary and mutually reinforcing functions of BRs" (Price 2002, 15).

On the other hand, UNESCO-MAB Secretariat defines the PR process and its objective as:

"...a time to take stock of progress made by the BR, especially as concerns the updating of knowledge, skills and expertise in resource and ecosystem management. It also provides an opportunity to discuss the updating of the zonation system and assess its relevance, question the objectives and means of management policies and examine the issues and problems tied to implementation. It is also a time to discuss weak points. Its objective is to improve the quality of the BRs and their functioning as sites for testing and demonstrating approaches to sustainable development." (UNESCO 2014a)

The requirement for PR reporting was re-iterated as Target 9 of the MAP (UNESCO 2008, 15): "all BRs undertake PR and related actions to update zonation, management and other changes to meet Seville and MAP requirements and recommendations", under the responsibility of the MAB National Committees as focal points.

> ➢ PR report content and requirements

The PR report is used by UNESCO-MAB Secretariat for 2 purposes: (1) review by IACBR and ICC/MAB Bureau for appraisal of the BR; (2) update the BR's information on the official website (also called UNESCO-MABnet) and WNBR directory. On the other hand, it is unclear whether the local BR authorities are using the PR reports for any management purposes besides reporting to UNESCO-MAB Secretariat.

The first PR form (1996) was designed by UNESCO-MAB Secretariat and utilized by most BRs who conducted PR reviews to date (2015) (Annex 1.1). In January 2013, and based on the MAP Target 1.4: "Update the […] PR forms for BRs by 2010" (UNESCO 2008, 11), a new version of the PR was published by UNESCO-MAB (Annex 1.2). The new PR form is readily available online for download by relevant parties in three of the UN languages: *English*, *French*, and *Spanish* (UNESCO 2014a).

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[7] Reference: UNESCO 1996, 16-17, also available in Appendix 1.1.

The form's updates reflect the evolution of the BR concept and overall MAB strategy changes (UNESCO 2015a). Compared to the old form template (23 pages), the new one is much longer (43 pages) and adapted to the conceptual changes made in the BR definition since 1996, especially after 2008 (Section 2.3.3). The range of subjects is more comprehensive, and questions under each category are much more specific, requesting detailed information. Table 6 presents a comparison of the main structure for the body of text of the two reports, illustrating the main changes made.

Table 6: Comparison of structure for the two versions of the PR Forms

Chapter	PR report: old version titles (1996-2012)	PR report: new version titles (>2013)
1	Name	Biosphere reserve
2	Country	Significant changes in the Biosphere Reserve during the past ten years
3	Physical characteristics	Ecosystem services
4	Zonation	The conservation function
5	Human activities	The development function
6	Research and monitoring programmes	The logistic function
7	Education, training and public awareness programmes	Governance, biosphere reserve management and coordination
8	Institutional arrangements	Criteria and progress made*
9	Conclusion: Criteria and progress made*	NA

*Refers to criteria of Article 4 of the *Seville Statutory Framework*
NA= Not Applicable

As Table 6 shows, important changes include: (1) tracking changes made and actions taken based on ICC recommendations in the case of second reports (new version, Chapter 2); (2) emphasizing more the BR functions fulfilment as well as governance, management and coordination; (3) introducing the "ecosystems services" dimension of BRs. In addition, although not reflected in Chapter titles (Table 6), the 2013 PR Form introduces an emphasis on the role of BRs in "climate change" and social aspects such as "gender mainstreaming", which clearly reflect the future strategic directions of MAB (Section 2.3.3.4).

Moreover, the PR questions are mostly descriptive in nature, inquiring about the "what", "how" and "who", of each of the above questions, in the perspective of assessing the degree to which the concept of the BR is being well implemented. Chapter 9 in the old form (Appendix 1.1)- equivalent to Chapter 8 in the new one (Appendix 1.2)- specifically requests from the reporting State/BR Authority to justify how each of the Statutory Framework's Article 4 criteria are being

fulfilled. Both forms require an Appendix, the provision of supportive documentation including maps, species lists, legal documents and land use plans etc., as well as updated contact information and media that would be used for the online directory of the WNBR (i.e. on UNESCO-MABnet).

- **PR procedures**

As defined in Article 9 of the Statutory Framework, as of 1995, the PR review is requested from all BRs 10 years after their designation year. The detailed procedure entails the following steps (Price 2002; Price *et al.* 2010):

- <u>Step 1:</u> MAB Secretariat sends a request to the State/Authority in charge of the BR to be reviewed;
- <u>Step 2:</u> State sends the report to the MAB Secretariat who transmits it to the IACBR;
- <u>Step 3:</u> IACBR reviews the report, weights it against the criteria of Article 4 of the Statutory Framework, and sends recommendations to MAB Secretariat (unless totally satisfactory, in the case of which the below steps 5 and 6 do not apply) for better compliance with the criteria;
- <u>Step 4:</u> The MAB Sec. transmits the recommendations to the concerned State;
- <u>Step 5:</u> The State sends back to the MAB Secretariat an updated report after taking corrective actions based on recommendations;
- <u>Step 6:</u> IACBR reviews the final PR report and makes a recommendation to the ICC/MAB Council;
- <u>Step 7:</u> ICC makes the decision, which could be summarized as either "satisfactory" or "unsatisfactory" in terms of compliance with criteria of Article 4.

If the PR report is unsatisfactory due to its quality and lack of local expertise in writing the PR, the IACBR recommends assistance from the relevant UNESCO Regional Office to guide the BR management in preparing the PR; this recommendation is reviewed by the ICC before it is sent to the concerned authority in charge of the BR (Ramadan-Jaradi pers. comm.) At the end of the procedure, if the final PR evaluation outcome remains unsatisfactory after potential assistance from UNESCO and/or recommendations from ICC to operate changes in the BR locally for compliance with the Statutory Framework's Article 4 and other BR requirements, the ICC can notify the UNESCO Director General that the reviewed BR will no longer hold this designation. Alternatively, the State of the BR concerned can voluntarily announce withdrawal of the BR from the WNBR.

- **PR implementation**

According to the MAB Secretariat, the number of PR reports received and examined by the ICC has reached a total of 356, of which 16 are from the ArabMAB Network (UNESCO 2014b). Reports are completed by various parties, including site managers, national MAB Committees, and/or consultants. Some countries took additional actions in preparation of the review process and based on its requirements. Reported actions include: national level participatory processes leading to a review of a wider scope of issues related to all reserves in the country; and extension of the BR zones in order to better apply the BR conceptual requirements (Price 2002).

As of 2014, the review of these reports has resulted in the withdrawal of 16 BRs from the network, none of which is from the Arab region (UNESCO 2014c). With the exception of the Southwest BR in Australia, all withdrawals are from Europe, and the majority is voluntary (UNESCO 2014c). For example, in the UK, UNESCO-MAB's request for the PR review led to a national evaluation of all sites, after which the government decided to withdraw 4 BRs that couldn't fulfil the criteria. In this instance, factors influencing this decision included: absence of human settlements within the overall BR area, difficulty to redefine and/or expand certain zones for better compliance with the functional zonation scheme, need for organizational arrangements for involvement and participation of stakeholders, and need for more integrated BR management plans and policies and implementing agency. Some or all of these factors couldn't be structurally accomplished, and/or would not be cost-effective to operate especially given the resources needed and the (sometimes) limited benefit the BR designation would bring to sites that are already well managed for conservation purposes at the national level (Price 2002; Price *et al.* 2010; Stoll-Kleemann *et al.* 2010).

In contrast, 340 BRs were compliant and remained within the WNBR. Some of these BRs had to make effective zonation changes or comply with other recommendations from ICC before approval of their PR reports.

- **Evaluation of the Periodic Review process**
  - ➢ Successes:

Compared to the pre-Seville period, the introduction of the PR process - as the first and only required BR monitoring system- by the MAB Secretariat proved beneficial to the compliance and alignment of the BR implementation with the BR concept. At the site level, improvements were made through improved zonation and integration of functions, and increased dialogue

between stakeholders and UNESCO-MAB institutions (UNESCO 2014e). Overall, the PR process has been successful in the collection of updated information about the WNBR and consolidating the BR concept. The PR increased the value and credibility of the MAB program throughout the network by enforcing adherence to the requirements, and implementing withdrawals when necessary. However, the PR monitoring system has encountered many challenges, some of which were addressed by the MAB Secretariat (in consultation with the IACBR and with the approval of the ICC), while others prevail (Price *et al.* 2010).

> Delays and non-response:

A summary of submission dates of BRs globally shows that many PRs are submitted with several years of delay (UNESCO 2014b). In parallel, the acceptance of these reports by UNESCO-MAB Secretariat despite the delays reflects a large flexibility about the "10-year submission due date". In 2009, the ICC reported that 220 PRs had already been submitted to the MAB Secretariat, but one fifth of the Member States (21 countries) had not yet submitted any PR reports despite the fact that some of their BRs were designated before 1996 (UNESCO 2009, 1). Again in 2010, submissions were short 130 reports of 359 for BRs designated before 2000, which indicated a continuous gap in response levels to the PR requirement (Price *et al.* 2010). The problem of non-response also applied to BRs that received recommendations by the MAB Secretariat for corrective measures, based on a first submission (Price *et al.* 2010).

To address the issue of delay and non-response, the MAB Secretariat introduced the Exit Strategy in 2013 (UNESCO 2014e). Briefly, the strategy consists of sending "warning letters" to non-respondents 3 months after the first PR report request, and – in the case of non-response to the first letter- another letter is sent 6 months after the first one. If the concerned State doesn't send any feedback, the MAB Bureau reserves the right to recommend to ICC the withdrawal of the BR from the WNBR (EuroMAB 2013). The Exit Strategy "threatens" around 266 BRs in 76 countries (UNESCO 2014f), which reflects the high level of non-compliance with PR reporting and/or recommendations so far. The first stage of implementation of the Exit Strategy has increased response levels with many new PRs received in direct response to "warning letters" (UNESCO 2014e). In addition, UNESCO-MAB has set the 30th of September 2015 as a final deadline for complying with Article 4 criteria either through PRs or responses to recommendations i.e. follow-up reports (UNESCO 2014e).

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➢ <u>Challenges at the national and site level:</u>

Various parties, including national MAB committees, consultants, and BR managers, with different financial means and level of expertise, complete PR reports. The main identified challenges for effective PR reporting and compliance relate to technical and financial capacity. First the cost of the PR evaluation procedure and expert fees could be relatively high in some countries. Price and colleagues (2010) conducted a first assessment of "costs to prepare one PR report" showing a wide range that starts at "near zero" in Canada where the evaluation is conducted by volunteering experts (Reed and Egunyu 2013), and reaches up to 43,000 USD in France. However, a broader research on this subject is needed for a more accurate world estimate since this evaluation was limited to 8 countries and hence does not represent the WNBR geographical diversity (Price *et al.* 2010). Second, the lack of human or financial resources for operating required changes at the site level- for fulfilment of recommendations/criteria- was also reported as a limiting factor to compliance. In some cases, these costs weighted against "perceived benefits" led to the authorities' decision to withdraw from the WNBR. Examples include the Australian Southwest BR and 5 other sites in the UK, where the BR designation was not perceived to be adding much value to those sites with a conservation focus (Price *et al.* 2010). In response to these challenges, the UNESCO-MAB Secretariat has expressed a commitment to offer technical support through UNESCO's regional offices. Hence, in the case of the ArabMAB Network, this is the responsibility of the Cairo regional office (UNESCO 2014e), however no formal assistance on their part has been practically recorded yet (Ramadan-Jaradi pers. comm.).

In conclusion, the need to improve the quality of PR reports -by improving local capacities to develop such reports- has been identified worldwide by UNESCO-MAB Secretariat that decided to channel such assistance through regional offices. However, it is not yet clear to which extent this technical support has been institutionalized (i.e. integrated into regional offices' plans and agendas) and transformed into commitments from regional offices, including from the regional UNESCO Office in Cairo for the ArabMAB Network. However, in order to ensure effectiveness of such an assistance process within the ArabMAB Network (or other MAB Networks) a formal follow-up will be needed by the MAB-Secretariat on regional offices (UNESCO Cairo office for ArabMAB Network) about the provision and appropriateness of such assistance. Moreover, once/if this assistance is provided, there will be a need to monitor whether the type and depth of assistance is sufficient to remedy the capacity gap of Arab States to effectively conduct the PR review and complete a quality PR report. Moreover, capacity-

building will be needed at another level: to increase the capacity of Arab BRs to implement required changes based on recommendations from the ICC (after PR reports' review, and before re-submission) when applicable.

- **Limitations of the Periodic Review review monitoring tool and process**
  - ➢ <u>Limitations of the periodic review:</u>

Until 2010, the effectiveness of the PR process as a tool for "quality-control" was criticized due to *weak enforcement* of withdrawing non-compliant BRs from the WNBR (Price *et al.* 2010). However, the recent (2013) introduction and implementation of the Exit Strategy suggests that UNESCO-MAB Secretariat is addressing this issue through stricter enforcement of reporting (UNESCO 2014e).

Moreover, similarly to the PAME evaluation tools, the PR process is a *self-assessment* subject to bias from several sources throughout the process, especially from the interviewee, and evaluator (i.e. how the evaluator understands the PR influences the result) (Chapter 4, Section 4.8.2). UNESCO-MAB tries to mitigate this limitation by requesting supportive documents to the PR claims as part of the PR Report (Appendix 1.2) (UNESCO 2013). Moreover, IACBR encourages the PR evaluation to be a cooperative process involving stakeholders representing the array of involved parties in the management of the BRs (Price *et al.* 2010). If implemented, collaborative reporting processes would reduce the interviewee and evaluator bias (Cook and Hockings 2011), however many countries still lack the resources and infrastructure necessary to ensure stakeholder involvement (Price *et al.* 2010).

In addition, on-the-ground validation mechanisms by UNESCO-MAB are still missing for crosschecking truthfulness of qualitative information provided in the PR. Finally, the 10-year PR reporting timeline has been criticized as "too long to effectively monitor changes occurring in BRs or actions taken to respond to recommendations" (Price *et al.* 2010, 555).

  - ➢ <u>Previous recommendations for improvement</u>:

Research and documentation on effectiveness of the PR process and implementation locally and regionally is still very limited. The UK and Canadian experiences are the only published ones so far, bringing a first set of recommendations for improving the PR process in their respective countries and internationally when applicable (Price *et al.* 2010; Reed and Egunyu 2013). Reviews from the two countries consistently led to the following recommendations:

- Reduce the reporting timescale to 5 years instead of 10 years for more effective tracking of progress over time.
- Emphasize shifting the BR evaluation discourse from a "stick and carrot" procedure perceived as a burden to overcome by BR stakeholders, to a collective learning process for adaptive management as recently promoted by UNESCO-MAB Secretariat (Bouamrane 2007).
- Establish information-sharing platforms and mechanisms to be used for sharing information about the purpose and benefits of PRs, PR reports and best practices.

The objectives of these recommendations would be to enhance the understanding of the PR process and its benefits, emphasize its "learning" aspect, and ultimately improve management effectiveness of BRs.

Shortening the PR reporting timescale to 5-years was seriously discussed in the IACBR, however, since the number of reviewers is limited to 10 while the number of PRs is expected to double, the idea was abandoned (Ramadan-Jaradi pers. comm.). Therefore, the establishment of (less costly) interim reviews- such as the rapid assessment proposed in this research (i.e BREMi assessment) is potentially a good alternative to shorten the timescale of evaluations, and promote internal evaluation mechanisms that benefit BR management directly and allow them to update their management plans and actions.

2.3.7 Summary and convergence of the evaluation discourses

After presenting the PA and BR management and evaluation literature independently in Sections 2.2 and 2.3.6 of the literature review, the following Section attempts to draw a parallel in the evolution of PA and BR MEE discourses in the aim of summarizing the milestone events and identifying a potential convergence.

2.3.7.1 Convergence of the protected areas and biosphere reserves evaluation discourses

Table 7 presents the parallel evolution of PA and BR evaluation discourses with milestone dates in a chronological order, revealing a remarkable similarity in dates and related events both conceptually and practically.

Table 7: Parallel evolution of the MEE discourse for PA(s) and BR(s)

| Year | Milestone events | |
	Protected Areas evaluation discourse	Biosphere Reserves evaluation discourse
< 1995	1. Need for MEE identified due to "paper parks" defined as designated PAs that do not meet the objectives they were created for.	1. Need for evaluation identified due to "paper BRs" defined as BRs that do not fulfil the 3 functions of conservation, development and logistic support.
1995	2. Creation of an IUCN-WCPA Management Effectiveness Task Force to guide the development of PA MEE tools.	2. The Seville meeting results in the *Seville Strategy and Statutory Framework* that introduces a PR process as an evaluation requirement every 10 years of designation (including for BRs designated before 1995).
1996	3. Development of the first MEE framework for PAME evaluation by WCPA, called the WCPA Framework.	3. Publication of the first version of the PR Form as the only tool for BR MEE by UNESCO-MAB Secretariat.
>1996	4.1 Many MEE tools are developed based on the WCPA Framework, by different institutions, and adapted to different PA types. 4.2 MEE tools are widely implemented and used by individual PAs for self-evaluation, and/or reporting for funding institutions. 4.3 In 2004, the COP7 for the CBD introduces MEE reporting as a requirement for signatory countries for at least 30% of their PAs (in coverage) by 2010.	4. The PR Form remains unchanged and UNESCO-MAB Secretariat starts implementing the request for PR reporting as a measure for "quality control" and evaluation of compliance with BR criteria (Article 4 of Seville Statutory Framework)
2008	5. WCPA publishes the Global Study: a review of MEE evaluations and experiences since 1995, collecting and drawing lessons from >50 different MEE methods and 8000 evaluation reports.	5. The Madrid meeting results in the Madrid Action Plan (MAP) which introduces a requirement to evaluate the Seville Strategy implementation achievements (MAP-Action 1.1), in addition to updating the PR form by 2010 (MAP-Action 1.4).

	Milestone Events	
Year	Protected Areas Evaluation	Biosphere Reserves Evaluation
2010	6.1 WCPA develops a Common Reporting Format (CRF) identifying 33 standard Headline Indicators to all MEE evaluation tools. 6.2 CBD requirements to Member States becomes stricter with an increase in PA MEE coverage to at least 60% by 2015.	6.1 UNESCO-MAB Secretariat establishes an ICC working group for updating the PR Form*. 6.2 A high non-response rate from UNESCO Member States to the PR requirements or resulting recommendations puts "pressure" on UNESCO-MAB (especially from compliant States) to implement stricter enforcement mechanisms, and apply the withdrawal procedure. 6.3 A mid-term evaluation of the MAP implementation is conducted and identifies the needs of the final evaluation to be conducted in 2013.
2013/14	7.1 The World Parks Congress and new Protected Planet report (2014) put more emphasis on the effectiveness of PAs, and the importance of evaluation and of sharing lessons from experiences**. 7.2 Digital information-sharing platforms are in development such as the UNEP-WCMC database of reports collected by WCPA.	7.1 UNESCO-MAB Secretariat introduces the Exit Strategy in response to criticism of weak enforcement, and a deadline of 30 September 2015 for final proof of compliance to concerned BRs. 7.2 The reviewed second version of the PR Form is published and replaces the older form. 7.3 The MAB-Secretariat conducts and publishes the Final Evaluation of the MAP for BRs, which provides guidance for the new 2015-2025 MAB Strategy. 7.4 Information-sharing platforms are emphasized to share experiences between BRs (Clearing House); model sites and "model PR reports" are shared online through the UNESCO-MABnet website.
>2014	New strategic directions	

*Reference: Price *et al.* 2010.
**Personal observation from attendance at World Park Congress 2014

While the discourse evolution is quite similar in terms of milestone dates and type of changes, important differences are noted:

- PAME evaluation tools are all based on the WCPA Framework, however they are varied, flexible and adaptable to the case of each PA based on its management objectives; while the PR report is a standard form designed by UNESCO-MAB and handed to the authorities;

- PAME tools are largely quantitative, while they include a qualitative component, however the PR report is solely qualitative in nature;

- PAME evaluation is recommended as a frequent and iterative evaluation process embedded in the PA management cycle, while PR is required only once every 10 years.

- PAME evaluations have been more integrated as part of internal management procedures for adaptive management, in parallel to their use for global reporting. However, the PR process remains a largely "top-down" requirement by UNESCO-MAB and is largely perceived as a "cumbersome" procedure by BR managers rather than a learning opportunity (Price 2002).

2.3.7.2 What does literature tell us so far?

The need to assess management effectiveness of both PAs and BRs was identified around the same period (<1995), and has been addressed differently by both "responsible" stakeholders: WCPA Management Effectiveness Task Force and UNESCO-MAB Secretariat respectively. Despite the efforts made by UNESCO-MAB to address this need through the development and improvement of the PR reporting system, there are still significant compliance issues, delays and lack of understanding and capacity on the ground to fully comply with the process. Moreover, the PR as a monitoring tool still presents many challenges that limit its effectiveness and practical use. These limitations have also been voiced by BR authorities of which "Member States have continued to call for the development of a monitoring and evaluation system in order to systematically measure management effectiveness and improve information availability" (UNESCO 2014d, 7).

In order to address this gap, this research looks at the opportunity of combining knowledge from both the WCPA Framework derived tools and the PR tool in the perspective of bringing the first innovative standard and customizable tool for the systematic evaluation of BRs on a flexible timescale.

After reviewing the global PA and BR management and effectiveness literature and identifying their main characteristics, the third and final part of the literature review focuses on the geographical scope of the research: the Arab region.

2.4 ArabMAB Network's contextual characteristics

Section 2.4 provides an overview of the main socio-economic, environmental characteristics and trends in the Arab region (22 countries) with a focus on the 11 countries of the ArabMAB Network. A summary of major conservation efforts is then provided within which the regional MAB program implementation is embedded.

2.4.1 General background

Located at the crossroads between Asia, Europe and Africa, the Arab States consist of 22 countries (as per UNESCO classification of Arab States). They include 12 countries in West Asia (Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, Occupied Palestinian Territories, Qatar, Saudi Arabia, Syria, UAE and Yemen); 6 in North Africa (Algeria, Egypt, Libya, Morocco[8], Sudan[9] and Tunisia); 3 in East Africa (Comoros, Djibouti, Somalia), and 1 in West Africa (Mauritania) (Fig. 7). The 11 countries that host BRs in the Arab region (i.e. ArabMAB Network) can be divided into the following categories: (1) Mashreq (Egypt, Jordan, Lebanon, and Syria), (2) Maghreb (Algeria, Morocco, and Tunisia), (3) Gulf Countries (Qatar and UAE), and (4) Least Developed Countries (LDC) (Sudan and Yemen) (UNESCWA 2010).

Fig. 7: Map of Arab States
Source: Smokey 2000

Although Arab countries share some common features such as language and a very rich and ancient history, they generally present large disparities, especially in terms of natural features, demography, wealth and economic development (Mirkin 2010). Indeed, the region presents a wide range of ecosystems due to its diverse geological and climatic features. Main ecosystems represented are: deserts, wetlands, oases, forests, as well as coastal and marine ecosystems including islands. The desert is represented in all Arab countries, except in Lebanon that presents -in its dryer places, a semi-arid area.

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[8] Morocco is assumed to include the disputed Western Sahara throughout this dissertation
[9] Sudan is assumed to include South Sudan when it is mentioned alone in this dissertation (started in 2011)

Moreover, "perhaps no other region in the world is marked by such extreme disparities in wealth as the Arab Region" (Mirkin 2010, 7), which encompasses some of the poorest countries in the world (Comoros, Djibouti, Mauritania, Somalia, Sudan and Yemen) and some of the world's wealthiest (Kuwait, Qatar and the UAE). Moreover, large differences in country area, population size, central governance, and human development (HDI) exist between countries of the Arab region. These characteristics are summarized in Table 8 for countries of the ArabMAB Network.

Table 8: Governance, demography and human development profile of Arab-MAB Network countries

Country	Surface area (km²) [a]	Population size (July 2014)[a]	Central governance[a]	HDI value (2014)[b]	Human Development Category[b]
Algeria	2,381,741	38,813,722	Republic	0.717	High
Egypt	1,001,450	86,895,099	Republic	0.682	Medium
Jordan	89,342	7,930,491*	Constitutional monarchy	0.754	High
Lebanon	10,400	5,882,562*	Republic	0.765	High
Morocco	446,550	32,987,206	Constitutional monarchy	0.617	Medium
Qatar	11,586	2,123,160	Emirate	0.851	Very High
Sudan	1,861,484	35,482,233	Federal republic ruled by the National Congress Party (NPC)	0.473	Low
South Sudan (since 2011)	644,329	11,562,695	Republic	n.a.	n.a.
Syria	185,180	17,951,639	Republic under an authoritarian regime	n.a. (*in sharp decline due to war*)	n.a.
Tunisia	163,610	10,937,521	Republic	0.721	High

Country	Surface area (km²) [a]	Population size (July 2014) [a]	Central governance [a]	HDI value (2014) [b]	Human Development Category [b]
U.A.E.	83,600	5,628,805	Federation with specified powers delegated to federal government and others reserved to member emirates (7)	0.827	Very High
Yemen	527,968	26,052,966	Republic	0.500	Low

*Reflects assumptions about the net migration rate due to the increased flow of Syrian refugees.
Notes: n.a.=not available; "surface areas" and "population size" figures are debated for some countries due to conflicts over land, occupation and migration; refer to source (a) for related notes on estimates; South Sudan and Sudan are grouped under one country (i.e. Sudan) during the study period and in most parts of this dissertation.
Sources: (a) CIA 2015, (b) UNDP 2014

As shown in Table 8, the ArabMAB Network's region is characterized by a majority (4/10) of *High HDI* countries, and an equal distribution for the remaining 6 countries in *Very High*, *Medium* and *Low* HDI categories. This information is of relevance to this study as previous research provides evidence of significant positive correlation between PAME evaluation scores and country's HDI (Leverington *et al.* 2008). In addition, the country's central governance model can have direct or indirect influence on the BR governance model and management effectiveness through creating an enabling or, alternatively, unfavorable political environment. However, the identification of these direct linkages is beyond the scope of this research, and would be a subject of interest for further research focused on political context in relation to BR management effectiveness.

2.4.2 Regional trends impacting the environment

Rapid population growth, urbanization, and consequent increasing demand on natural resources constitute pressures on environmental resources and conservation sites. Other trends including wars and conflicts cause direct damage to ecosystems, and threaten national security, which can impact conservation through shifting national priorities and diverting financial resources. Hence, reviewing these trends in the Arab region provides a necessary background for better contextual interpretation of the research results.

2.4.2.1 Rapid population growth and pressure on resources

Arab countries have witnessed rapid population growth and density increase over the last thirty years, which is considered one of the greatest challenges for sustainable development in the region (El Masry *et al.* 2010). Population size has doubled between 1980 and 2009 reaching

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352 million, equivalent to 5.2% of the world's population (UNESCWA 2009). The number remains on the rise and is expected to reach 595 million by 2050 (Mirkin 2010).

Concomitant with population growth, increasing demand on natural resources has led to over-exploitation through expansion of cultivated land, over-grazing, as well as over-exploitation of forest resources and vegetation such as ligneous and fibrous plants used for heating and feeding cattle. Land degradation was exacerbated by the use of inappropriate irrigation methods leading to water logging and desalination (UNESCO 1997). Coastal and marine biodiversity are particularly affected and remain threatened by anthropogenic sources. Main threats include coastal development operations of dredging and infilling, overfishing, as well as industrial and sewage run-off in some countries (El Masry *et al.* 2010; UN 2010).

2.4.2.2 Urbanization and water scarcity

The region is characterized by large migration movements from rural to urban areas, accompanied by shifts from traditional farming to manufacturing and service sector economies (Mirkin 2010). Urban developments have particularly affected the coastlines of Arab countries. It is reported that urban development covers 40 % of the coastal areas in some countries (AFED 2008). In addition, uncontrolled tourism exacerbated the problem by creating more pressure on coastal ecosystems especially on the Mediterranean shoreline, a popular tourist destination (AFED 2008). However, populations of the poorest countries in the Arab region remain more concentrated in the rural areas suffering from poor infrastructure and access to water resources (UN 2010; UNESCWA 2010).

Moreover, the third UN Arab Report to the Millennium Development Goals (MDG) 2010 highlights: "at least 15 countries are facing the threat of depletion of their renewable and non-renewable water resources. Some countries are well below the water poverty threshold of 1000 m^3 per capita per year including Bahrain, Kuwait, Libya, Oman, Qatar, and the United Arab Emirates" (UNESCWA 2010, 79). Egypt, Morocco and Tunisia are facing a serious shortage in availability of fresh water (UNESCWA 2010). The water scarcity problem in the Arab region is expected to worsen with the impacts of climate change on water bodies (UNESCWA 2010).

2.4.2.3 Wars and conflicts

The Arab region has suffered from many wars and conflicts over land and natural resources, the impact of which is largely damaging to the environment and biodiversity (Hanson *et al.* 2009). In addition to the long history of wars and long-standing conflicts, the Arab region has

witnessed recent uprisings, jointly referred to as "Arab Spring". Revolutions, and armed conflicts have been taking place in Egypt, Libya, Sudan, Syria, Tunisia, and Yemen, some of which have led to very destructive and deadly civil wars (Libya, Syria, Sudan, Yemen). Damage from conflict situations includes: air, soil and water pollution; land degradation and loss of biodiversity; and physical damage to cultural heritage (UNESCWA 2010). Examples of recent conflicts in the region that significantly damaged the natural and cultural heritage include:

- the Darfur conflict over scarce natural resources in Sudan; which ended in the separation of South Sudan and Sudan;

- the Israeli bombing of fuel tanks in Lebanon in 2006 releasing 15,000 tons of heavy fuel oil into local seawaters and shores;

- the Palestinian-Israeli conflict leading to a recent loss of 17% of the total cultivated area in the Occupied Palestinian Territories (UNESCWA 2010, 86); and

- the recent civil wars in the Arab region- especially the protracted and on-going war in Syria.

2.4.2.4 Sustainability and national priorities

The *Arab Environment: Future Challenges Report* highlights that less than 1% of national budgets are generally allocated to environmental sustainability in the Arab region, which reflects the very low priority placed on the environment in Arab national agendas (AFED 2008). This can be partially due to the lack of peace and security in the region, which channels resources to "more pressing" issues such as aid, poverty alleviation and rehabilitation (UNESCWA 2010). One of the consequences of the national budget shortage for environmental protection is the minimal budgets allocated for conservation (one branch of environmental management), and hence the dependency of local institutions on unpredictable foreign aid flow, and the lack of capacities for local civil society and NGOs to manage natural resources and conservation areas (UNESCWA 2010). Foreign aid is not nearly close to the needed finances for appropriate protected areas management in the Arab region, a common issue to PA financing worldwide (Bertzky *et al*. 2012).

2.4.3 Biodiversity and conservation

2.4.3.1 Biodiversity values and status

The Arab region alone hosts five of 34 sites recognized globally as terrestrial biodiversity hotspot areas, and one of 11 hotspot areas for marine biodiversity (UNESCWA 2010, 86). The high and unprecedented growth in population and economic activities that took place in the past three decades have put increasing pressure on species and habitats resulting in the need for urgent action to halt the degradation and species decline, and meet the CBD and MDG Target 7.B requirements (UNESCWA 2010).

One of the main important aspects of biodiversity in the Arab region is the high level of endemism. Known endemic species include 3397 flora, 39 mammals, 30 birds, 132 reptiles and 8 amphibians (El Masry *et al*. 2010, 11). Reported numbers of species across the region are often inconsistent

> At the global level, biodiversity is declining at a faster rate now than any time in the past and in the Arab region it is expected to continue to decline unless drastic measures and concrete steps are taken to reduce the loss of biodiversity and the protection of species and habitats (UNESCWA 2010, 86).

when using different sources, which could reflect a gap in comprehensive assessment of species in the region. Disparities in reported species numbers are reflected in Table 9, which uses the Arab Forum for Environment and Development 2009 report (AFED 2009), and the IUCN 2015 Red List sources for the 11 countries of the ArabMAB Network (IUCN 2015).

Table 9: Disparity in species numbers reported for Arab-MAB Network countries

Country	Plant species numbers*	Animal species numbers*	Native species numbers**(2015)
Algeria	3164[a]	2941[b]	1158
Egypt	2076[a]	-	1772
Jordan	2100[a]	-	1220
Lebanon	3000[a]	4486[b]	842
Morocco	3675[a]	3675[a]	1803
Qatar	371[b]	-	568
Sudan	3137[a]	-	3709
Syria	3000[a]	2518[b]	1010
Tunisia	2196[a]	2244[b]	960
United Arab Emirates	-	-	797
Yemen	-	-	2019

*   Reproduced from Talhouk and Abboud 2009. Note: Morocco includes Western Sahara
** Source: IUCN Red List 2015, numbers exclude *Extinct* and *Extinct in the wild*
  Source: (a) UNEP-WCMC 2005; (b) CBD national reports

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Due to the lack of updated and comprehensive official databases on species over time, it is difficult to infer any definitive biodiversity trends for the 11 countries studied. However, the recent 2010 Environment Outlook for the Arab region Report (EOAR) reports statistics on threatened species that reflect important losses in biodiversity values:

> *"the number of threatened species has reached 1084. Fish are worst affected, making up 24% thereof, followed by birds, 22%, mammals and plants, 20% each, with other living organisms accounting for the rest"* (El Masry *et al.* 2010, 12).

2.4.3.2 Conservation efforts and challenges

➢ Origins of conservation in religion and history:

Natural resources management in the Arab region dates back to pre-Islamic tribal practices in the Arabian Peninsula[10] (ancient Arabia) 1500 years ago. Local communities were then responsible of sustainably using "their" natural resources within allocated areas called "Hima" (*Arabic* word for "Protected") (SPNL 2010). Though the word "sustainability" did not exist, traditional communities had intuitive and traditional knowledge of sustainable practices. The Hima system was conducive to the preservation of biodiversity and other natural and cultural values in ancient Arabia through history. Governance of Himas was originally initiated and handled by tribal chiefs. However, it was gradually handed to religious leaders who would ensure equitable sharing of benefits with the underprivileged communities and within tribes. In countries of the Levant such as Lebanon, and in more recent days, governance was handed to municipalities and other democratically elected institutions (SPNL 2010).

In the modern conservation context, the word Hima stands for Human Integrated Management Approach (HIMA), defined as a:

> "*Community-Based Natural Resources Management (CBNRM) system that promotes sustainable livelihoods, resources conservation, and environmental protection for the human wellbeing.*" (UNU-INWEH 2014)

This special designation was only recently officially endorsed by IUCN during the 2012 Jeju World Conservation Congress (UNU-INWEH 2014), but is not included in the IUCN PA categorization system (Gari 2006). The Hima "conservation style" has been observed in other areas of the world, especially Africa and Asia (UNU-INWEH 2014), and remains in use as one approach to land management in the Arab region.

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[10] Peninsula between the Red Sea and Persian Gulf in Southwest Asia, which includes Saudi Arabia, Yemen Arab Republic, People's Democratic Republic of Yemen, Oman, the UAE, Qatar, and Kuwait (source: dictionary.com)

> ➢ Recent conservation initiatives:

Recent efforts towards the conservation of biodiversity and habitats in the Arab region include joining most biodiversity-related Multi-Lateral Agreements (MLA), as well as designating and expanding PA systems. Table 10 summarizes the main MLAs that ArabMAB countries are Parties to and their years of entry into force. These include: the Convention on Biological Diversity (CBD), the Ramsar Convention, the Convention on the Conservation of Migratory Species of Wild Animals (CMS), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Notably, all ArabMAB Network countries are parties of the CBD (Table 10).

Table 10: Biodiversity-related MLA in Arab-MAB Network countries

Multilateral Agreement (MLA) entry into force			
Country	CBD by ratification[a]	Ramsar (site numbers)[b]	CMS Status (Year)[c]	CITES[d]
Algeria	1995	1984 (50)	Party (2005)	1984
Egypt	1994	1988 (4)	Party (n.a.)	1978
Jordan	1994	1977 (1)	Party (2001)	1979
Lebanon	1995	1999 (4)	Range State	2013
Morocco	1995	1980 (24)	Party (1993)	1976
Qatar	1996	--	Range State	2001
Sudan	1996	2005 (3)	Range State	1983
South Sudan	2014	2013 (1)	Range State	--
Syria	1996	1998 (1)	Party (2003)	2003
Tunisia	1993	1981 (40)	Party (1987)	1975
United Arab Emirates	2000	2007 (5)	Range State	1990
Yemen	1996	2008 (1)	Party (n.a.)	1997

Sources: (a) www.cbd.int; (b) Ramsar Convention 2015; (c) www.cms.int; (d) www.cites.org

In parallel, there seems to be an expansion of PA systems in the Arab region, reflected in the increasing number of reported PAs from 174 in 1970, to 360[11] in 2007 (UNESCWA 2010, 87), 657 in 2009 (Talhouk and Abboud 2009, 108)[12], and 725 in 2012 (IUCN and UNEP-WCMC 2012). As noted for species numbers, these numbers should be interpreted cautiously as PA counts differ with sources of information, adopted reporting criteria etc. Table 11 summarizes reported PA numbers for the ArabMAB in recent years.

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[11] It is unknown whether these two numbers include international PAs
[12] Original source: IUCN and UNEP-WCMC 2009, no longer available online

Table 11: Reported PA numbers for the Arab-MAB Network countries between 2009 and 2015

Reported number of protected areas			
Country	2009[a]	2012[b]	2015[c]
Algeria	104	102	76
Egypt	32	48	50
Jordan	24	28	31
Lebanon	20	24	36
Morocco	81	84	324
Qatar	4	5	5
Sudan	44	45	49
Syria	18	19	19
Tunisia	87	86	106
United Arab Emirates	15	22	28
Yemen	-	9	10
Total	**429**	**472**	**734**

Sources: (a) Adapted from Talhouk and Abboud 2009, 108; (b) IUCN and UNEP-WCMC 2012; (c) IUCN and UNEP-WCMC 2015
Note: numbers do not account for potential changes during recent armed conflicts in many countries (Syria, Sudan, Yemen etc.)

Of 11 countries, the large majority (8) shows an increasing trend in PA numbers since 2009 (with a sharp increase in Morocco), while Qatar and Syria have stagnating numbers since 2012, and Algeria shows a decreasing trend (Table 11). However, the type of data and variety of sources make it difficult to draw definite conclusions, as some observations may be explained by different reporting criteria, definitions and accuracy.

Finally, other efforts of significance to biodiversity conservation in the Arab region include the development of National Strategies and Action Plans; investments in conservation projects from different multilateral institutions, from governments and private sector; and the promotion of fair and equitable sharing of benefits (El Masry *et al.* 2010).

2.4.3.3 Future challenges

Based on the literature, countries of the ArabMAB Network have made significant efforts towards conservation in the past 2 decades by joining related MLAs and following the global trend of increasing the numbers of PAs. The impact of these efforts on actual conservation outcomes are not well understood, neither are the impacts and risks of recent destructive conflicts on conservation efforts. Nevertheless, from a perspective of pursuing conservation efforts, there is a need for increased regional cooperation and the development of integrated

solutions as emphasized in the Strategic Plan for Biodiversity 2011-2020 (paragraph 5 of decision X/2) where the CBD

> *"urges regional organizations to consider the development or updating of regional biodiversity strategies, as appropriate, including agreeing on regional targets, as a means of complementing and supporting national actions and of contributing to the implementation of the Strategic Plan for Biodiversity 2011-2020"* (CBD 2012).

This cooperation is yet minimal in the Arab region, which lacks regional and sub-regional biodiversity strategies (CBD 2012) for more synergistic results. Moreover, in the aim of reaching the CBD objectives, regional experts have strongly recommended the need to develop integrated approaches that reconcile conservation with sustainable development (El Masry *et al.* 2010).

It is important to note however that the socio-political context of turmoil and escalating conflicts in many countries of the Arab region constitutes a counter-productive environment to such aims. Though studying the impact of the security environment on conservation and sustainable development programs- including ArabMAB- is beyond the scope of this study, monitoring future trends in conflict are critical to understanding the possibility of fulfilling the needs of such programs.

2.4.4 The ArabMAB Network

Embedded in regional conservation efforts is the development of the regional component of the international MAB program, and its institutional framework. Indeed, the ArabMAB Network is one of eight regional MAB networks based on the geographic and cultural classification of the UN for Arab States. Following is a presentation of the evolution, characteristics and governance of the BRs populating this research.

2.4.4.1 Institution objective and structure

The creation of regional networks of BRs is a key feature of the UNESCO-MAB program that aims at facilitating the exchange of knowledge and experience regionally and fostering collaboration between BRs. As an institution, ArabMAB Network was established in Amman, Jordan in 1997, with the main objective of promoting cooperation and collaboration between National MAB Committees of the region in order to facilitate and support the implementation of the MAB program in the Arab region. Main themes of cooperation defined by the ArabMAB Network include: (1) the designation and establishment of new BRs, and (2) the implementation of common research and educational activities (UNESCO 2014a).

The institutional structure of the ArabMAB includes an *Arab Coordinating Council* elected and mandated for formulating general policies, issuing decisions that promote the network, and following-up on their implementation (UNESCO 1998). This Council is composed of interested members of the *ArabMAB National Committees*, who elect an *ArabMAB Bureau* responsible for administration and management between two Council meetings. A regional *Secretariat* is also established in a host member country to cooperate activities with the regional *UNESCO office in Cairo*, and international *UNESCO-MAB Secretariat* (UNESCO 2014a).

2.4.4.2 Arab biosphere reserves

The ArabMAB Network currently includes a total of 27 sites in 11 Arab countries, one of which is transboundary between Morocco and Spain (Fig.1). The "Intercontinental Mediterranean BR" was originally excluded from the research due to the complex and different nature of its governance and the fact that it partially lies outside the Arab region. Hence, 26 sites in 11 Arab countries were targeted by the research and are presented in Table 12. In the course of survey data collection (Chapter 4), the number of BRs targeted was reduced to 25 due to the impossible access to the Lajat BR in Syria in the midst of continuing civil unrest and conflicts.

Table 12: Biosphere Reserves of the Arab-MAB Network (2014)

Country		Biosphere reserve	Surface area (km^2)	% of country coverage	Designation date
ALGERIA		**Country area**	**2,381,741**		
	1	Tassili N'Ajjer	72,000	3.023%	1986
	2	El Kala	763	0.032%	1990
	3	Chrea	370	0.016%	2002
	4	Djurdjura	357	0.015%	1997
	5	Gouraya	21	0.001%	2004
	6	Taza	16	0.001%	2004
		Total		**3.087%**	
EGYPT		**Country area**	**1,002,450**		
	1	Wadi Allaqi	23,800	2.374%	1993
	2	Omayed	758	0.076%	1981, 1998*
		Total		**2.450%**	
JORDAN		**Country area**	**89,342**		
	1	Dana	308	0.345%	1998
	2	Mujib	210	0.235%	2011
		Total		**0.580%**	

Country	Biosphere reserve	Surface area (km^2)	% of country coverage	Designation date
LEBANON	**Country area**	**10,452**		
1	Shouf	295	2.822%	2005
2	Jabal Al Rihane	184	1.760%	2007
3	Jabal Moussa	65	0.622%	2009
	Total		**5.205%**	
MOROCCO	**Country area**	**446,550**		
1	Arganeraie	25,688	5.753%	1998
2	Oasis du sud marocain	71,854	16.091%	2000
	Total		**21.844%**	
QATAR	**Country area**	**11,571**		
1	Al Reem	1,189	10.276%	2007
	Total		**10.276%**	
SUDAN	**Country area**	**1,886,068**		
1	Radom	12,500	0.663%	1979
2	Dinder	9	0.000%	1979
	Total		**0.663%**	
SYRIA	**Country area**	**185,180**		
1	Lajat	120	0.065%	2009
	Total		**0.065%**	
TUNISIA	**Country area**	**163,610**		
1	Djebel Chambi	437	0.267%	1977
2	Djebel Bou-Hedma	170	0.104%	1977
3	Ichkeul	141	0.086%	1977
4	IIes Zembra et Zembretta	8	0.005%	1977
	Total		**0.462%**	
U.A.E.	**Country area**	**83,600**		
1	Marawah	4,255	5.090%	2007
	Total		**5.090%**	
YEMEN	**Country area**	**527,829**		
1	Socotra Archipelago	26,816	5.080%	2003
2	Bura'a	43	0.008%	2011
	Total		**5.089%**	

*Extension date

Note: BR surface areas are rounded to the closest integer when converted from ha to km^2

Source: UNESCO 2014a

As observed in Table 12, Algeria hosts the largest BR in the Arab region (Tassili N'Ajjer; 72,000 km^2) as well as the largest number of BRs (6) in ArabMAB, followed by Tunisia (4). However, this doesn't translate into highest country coverage (3% and 0.5% respectively for the two countries). Morocco has a remarkable ~22% highest country coverage by two BRs mostly, which can be explained by the size of Oasis du Sud Marocain BR covering 16% of national land surface. The second largest country coverage is by the sole Al Reem BR in Qatar, of which the area constitutes 10% of the country's total. This information is relevant to this

study since the CBD requires PAME[13] evaluations and reporting for 60% of all national PAs by spatial coverage for signatory countries (CBD 2010).

Another interesting observation is that a smaller –though important number (10) of Arab BRs were designated in the pre-Seville period (<1995), while most (16/26) BRs are as recent as 1995. Notably, all Tunisian BRs have been designated very early in the MAB program (1977-1979). As demonstrated in Section 2.3.3, the designation period can largely determine the design and management infrastructure of the BR as the concept and MAB requirements shifted over time. Moreover, Anthony and Matar (2012) showed evidence of significant positive relation between the *time of establishment* of a PA and its management effectiveness results. In these perspectives, designation date constitutes important information to the research.

2.4.5 Protected area and biosphere reserve management effectiveness evaluation in the Arab region

Publically available PAME evaluation reports and/or PAME literature on the Arab region is sporadic and limited. The updated version of the Global Study, which constitutes the largest database of PAME reports to date, includes a limited record of reports from the Arab countries, especially from West Asia where only Jordan and Lebanon are partially represented (Leverington *et al.* 2010a, 2010b). Moreover, in a more recent rapid assessment of PAME in 18 PAs of the Levant (Syria, Lebanon and Jordan), only Jordan reported conducting a previous MEE on national PAs using the METT tool in 2008 (RSCN 2008; Anthony and Matar 2012). This recent research (referred to as the Levant Study in this dissertation) included 7 PAs from Lebanon, 8 from Jordan and 3 from Syria, overlapping with BRs of Lebanon and Jordan.

The PAME evaluation used the 33 HIs as an evaluation tool, which allowed comparison of MEE scores with the Global Study results (used as a benchmark). The main findings of the Levant Study of relevance to research questions of this study, are summarized below:

- The Levant PAME mean score (7.01) is significantly higher than the Global Study mean of 5.30.
- Of the three country PA MEE scores, only Jordan's mean score is significantly above the global average. The presence of a previous PAME evaluation in Jordan is positively correlated to higher MEE results for the country, as compared to the others, although causation was not demonstrated.

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[13] PAME and BR MEE are not considered equivalent in this claim, however BR MEE indirectly contribute to the CBD requirement since BRs usually integrate national PAs.

- Correlation of individual HI scores with overall MEE scores showed little similarities with the identified correlations in the Global Study, pointing at regional differences.
- The most effective aspect of PA management in the Levant is planning, which is consistent with the Global Study finding.
- HIs that show positive strong correlation with MEE scores, do not specifically correlate in the same manner with outcomes.
- Older PAs/BRs had better MEE scores than more recent PAs/BRs (Anthony and Matar 2012)

On the other hand, the state of the PR process and BR appraisal specifically in the Arab region has been presented earlier in the literature review as an integral part of the PR global situation (Section 2.3.6.2). However, a full assessment of the regional effectiveness of the PR process is missing so far, as in many regions of the world, and highlights another research gap that will be addressed by this study.

The literature review has provided a comprehensive understanding of the background of the research problem (overarching research question) and rationale, as well as a detailed presentation of all contextual aspects of the research focus i.e. the BR, and the geographical scope i.e. ArabMAB Network's region. The next Chapter will focus on the theoretical foundations that provide guidance to the development of methods, and ground the analysis and interpretation of findings in the theoretical framework selected for the study.

CHAPTER 3: THEORETICAL BACKGROUND

This Chapter outlines the theoretical underpinnings of the research that will guide the selection and design of methods, and facilitate the analysis of research findings in the perspective of addressing the main research question(s). The Chapter starts by introducing the main underlying theory of *resilience for socio-ecological systems*, and then develops into two main sections that summarize both management approaches supporting this theory: (1) Adaptive Management (AM), and (2) Adaptive Co-Management (ACM).

3.1 Resilience theory for complex social-ecological systems

Social-ecological systems are characterized by non-linearity, surprise/shock, alternative stable states and cross-scale dynamics in space and time (Holling and Sundstrom 2015). As part of a joint process of developing a better understanding of, and response to "disturbed regional socio-ecological systems", Holling launched in 1973 his work on AM, which he describes as resilience theory applied to management of social-ecological systems (Holling 1978, Holling and Sundstrom 2015).

As described by Holling and Sundstrom (2015, 12): "A resilient system is forgiving of external shocks. If resilience declines because of resource exploitation and loss of diversity, the magnitude of a shock from which it cannot recover gets smaller and smaller". Resilient systems are dynamic and evolving due to their capacity to learn and self-organize in times of change (Holling and Sundstrom 2015). In that perspective, resilient systems are characterized by high levels of (1) flexibility, (2) learning capacity, and (3) capacity to recover from occasional shocks through "creative collapses" (Holling and Sundstrom 2015). In contrast, when resilience is low, social-ecological systems are (1) rigid, (2) closed, and (3) seeking security rather than opportunity.

3.2 Adaptive management approach

3.2.1 Adaptive management concept

Emanating from resilience theory is the conceptual management framework of AM, described as a process of learning by doing that incorporates research, planning, management actions, monitoring and evaluation of actions, and adaptation in an iterative manner (Van Wilgen and Biggs 2011; Bertzky *et al.* 2012). Holling (1978), in his landmark work on Adaptive Environmental Assessment and Management, describes AM as an integrated, multidisciplinary

and systematic approach to improving management and accommodating change by learning from the outcomes of management policies and practices. Definitions of AM in the literature vary and include:

> *"a systematic and iterative approach for improving resource management by emphasizing learning from management outcomes. Adaptive management is not simply changing management direction in the face of failed policies; rather, it is a planned approach to reliably learning how to improve policies or management practices over time in the face of uncertainty"* (Bormann *et al*. 2007);

> *"a process to cope with uncertainty in understanding centered on a learning model where natural resource management actions are taken not only to manage, but also explicitly to learn about the processes governing the system"* (Medema *et al.* 2008).

The first definition has been adopted in the dissertation as it provides the most comprehensive understanding of the AM concept and process.

AM is mostly applied in situations when the scientific knowledge to predict the impact of the application of some management actions is missing, yet not applying any management actions could be deleterious on the ecosystem (Lee 1993; Whelan 2004). Whelan (2004) outlines the six steps to applying AM as summarized in Table 13.

Table 13: The six steps of adaptive management

STEPS	ACTIVITIES	SUMMARY
STEP 1	Assess the problem through input from many stakeholders, scientists etc.	Identify/Define Design/Model Analyze
	Identify issues and objectives	
	Define and quantify outcomes (modeling can be used with the best available data)	
STEP 2	Design an experimental model for management with alternative hypotheses	
	Define appropriate time-span for monitoring results	
	Identify potential constraints, threats, challenges and plan for responses	
STEP 3	Implement management actions	Implement
STEP 4	Monitor: monitoring is an integral part of the implementation process and should be allocated a separate budget in the planning phase	Monitor
STEP 5	Evaluate: needs input and communication between scientists and managers who will be involved in the statistical analysis of the results (of monitoring) and the assessment of the management implications of the findings	Evaluate
STEP 6	Adjust/Adapt the management practices under question	Adapt/Adjust
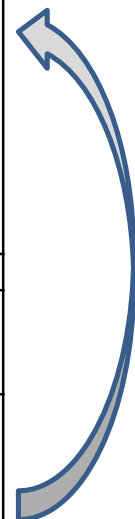
Source: adapted from Whelan 2004, 3-4.

3.2.2 Adaptive policies

Effective implementation of the AM approach requires the design and implementation of adaptive policies: "policies that can adapt to a range of conditions previously not imagined and perform even under complex, dynamic and uncertain conditions" (Swanson and Bhadwal 2009). Similarly to the AM cycle, the adaptive policy cycle is iterative and composed of the same steps of design, implementation and evaluation with automatic adjustments:

1. "Policy set-up: understanding the issue and policy objective setting;

2. Policy design and implementation

3. Monitoring and continuous learning and improvement:

    ▪   Integral to design are the monitoring and remedial mechanisms- should not be post ad-hoc additions after implementation

    ▪   Fine tune the process

    ▪   Learning and adaptation of the policy be made explicit at the outset and the inevitable policy changes become part of a larger, recognized process and not forced to be made repeatedly on an ad-hoc basis" (Swanson and Bhadwal 2009, 18).

3.2.3 Adaptive management approach applied to biosphere reserves

While the concept of AM was first mentioned in the late 1970s and applied for natural resource management of complex ecosystems (Holling 1978; Walters 1986), it was later adopted by conservation experts as a recommended approach to conservation site management and continues to be mentioned as such in new guidelines and reports (CMP 2007; Margules and Pressey 2000; Bertzky *et al.* 2012). Jacobson and colleagues (2009, 485) cite adaptive management as a "commonly identified way to address situations in which ecological and social uncertainty exist", a situation that particularly holds true in recent times of rapid environmental changes including climate change. Since the nature of social-ecological systems is complex, prone to uncertainties, and not yet fully understood, AM has been recommended by several experts in the conservation field as a key approach to effective PA management (Holling 1978; Margules and Pressey 2000; Salafsky *et al.* 2002; Tucker 2005; Hockings *et al.* 2015).

In the context of this research, the AM approach can be better understood when intertwined with the PA management planning cycle, hereby presented in Figure 8 (Margules and Pressey 2000; Tucker *et al.* 2005).
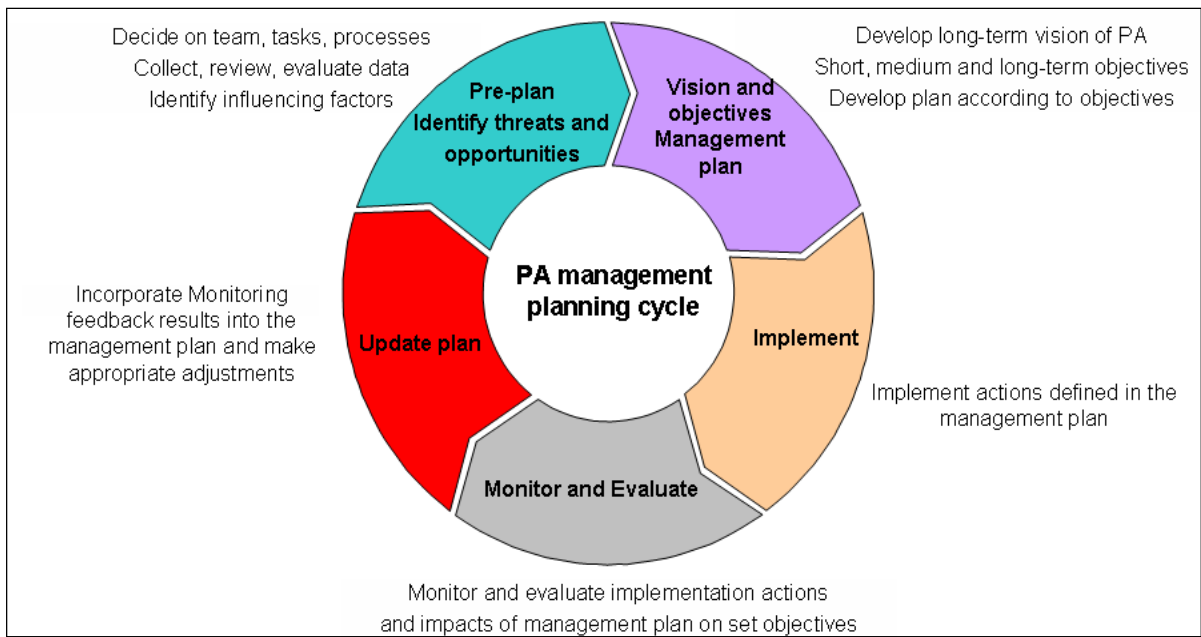
Fig. 8: Protected area management planning cycle
Adapted from Margules and Pressey 2000

Indeed, the six steps of the AM approach outlined earlier (Table 13) find their parallel in this PA management planning cycle (Fig. 8). When applied to conservation planning, AM entails a continuous process of evaluating impacts of conservation management actions in light of specified objectives, and making appropriate adjustments in order to adapt management actions to the evaluation results (Margules and Pressey 2000). This form of management has been defined by conservation experts as an "integration of design, management, and monitoring to systematically test assumptions in order to adapt and learn" (Salafsky *et al.* 2001a; Salafsky *et al.* 2002, 2).

AM is of increased relevance when considering the dynamic nature of the PA and BR concepts. As detailed in Chapter 2 (Section 2.3.3), continuous changes have been made to the BR concept as the MAB program progressed; these changes have significant implications on its rightful implementation. Moreover, the "various governance types in place within UNESCO-MAB's World Network of Biosphere Reserves reflect the range of interpretation of the BR concept" (Stoll-Kleemann *et al.* 2008, 6). In that perspective, the omnipresence of change at both the internal programmatic level and the contextual level (i.e. global changes such as climate change, urbanization etc.) calls for an adaptive type of governance and management as emphasized after the the Seville meeting (Section 2.3.3.2):

> "*Conference made a quantum leap in giving increasing emphasis to the 'M' of MAB BRs. It affirmed that BRs are 'more than protected areas' but rather a 'pact' between*

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the local community and society as a whole. Management should be open, evolving and adaptive." (Bioret *et al.*1998, 3)

3.3 Adaptive co-management approach

The *Adaptive Co-Management* (ACM) approach integrates the two concepts of AM and Collaborative Management (Co-Management) yielding an innovative approach that fosters AM using collaborative processes (Armitage *et al.* 2009). In the perspective of providing a deeper understanding of the ACM approach, the following Section first defines collaborative theory and its relevance to BR management, then presents the ACM concept and evidence of its usefulness to BR management.

3.3.1 Collaborative management concept

Gray's (1985, 912) conceptual definition of collaboration is:

> *"...the pooling of appreciations and/or tangible resources, e.g., information, money, labor, etc., by two or more stakeholders to solve a set of problems which neither can solve individually.*"

This definition applies to resource management whether at the decision-making or implementation levels (Selin and Chavez 1995). Indeed, collaboration implies: (1) joint decision-making, (2) power sharing, and (3) collective responsibility of stakeholders for their actions and subsequent outcomes (Selin and Chavez 1995). Hence, co-management promotes and enhances integrated management by creating more channels and opportunities to interact, communicate and reach consensus between the many stakeholders.

3.3.2 Collaborative management approach applied to biosphere reserves

Applied to BR management, stakeholders would include government bodies, research institutions, NGOs, communities and other parties. Co-management is proven to be conducive to more successful BR management, whereby the main managing institution ultimately acts a "facilitator" in the collaboration process and integration of efforts toward BR management (Table 4) (Stoll-Kleemann and Welp 2008). Participatory processes engaging multi-disciplinary management teams and encouraging participation of stakeholders have been recommended at many stages of the BR concept implementation and management cycle including: nomination, management planning, management decision-making, and PR process (Stoll-Kleemann and Welp 2008; Stoll-Kleemann *et al.* 2010; Price 2002; Reed and Egunyu 2013). Moreover, for successful collaboration, frequent and effective communication processes and platforms are required between stakeholders i.e. the management staff, government

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agencies, funding bodies, local community, NGOs and other involved parties (Margules and Pressey 2000; Salafsky *et al.* 2002; Tucker 2005).

3.3.3 Adaptive co-management concept

Similarly to AM, ACM recognizes that ecological and social uncertainties are inherent to governance, and that they are best addressed through collaborative processes that acknowledge multiple sources of knowledge (Armitage *et al.* 2009). Thus, ACM combines the learning-by-doing aspect of AM with the collaborative aspect of co-management, and has been suggested as an approach to dealing with complexity of interdependent social-ecological systems (Schultz *et al.* 2011).

Moreover, ACM approach is suited for situations of uncertainty and conflict, as it has also been put forth as an approach for conflict resolution (Armitage *et al.* 2009). It is flexible and tailored to geographical context and situation, supported by and working with several institutions at different scales (Armitage *et al.* 2009). Moreover, ACM refers to an "ongoing process that allows stakeholders to share responsibility within a system where they can explore their objectives, find common ground, learn from their institutions and practices and adapt and modify them for subsequent cycles" (Fabricius and Currie 2015). Successful implementation of ACM requires attention to trust-building, institutional developments, and social learning, which bring the challenges of "creating the social and institutional space for such interactions" (Armitage *et al.* 2009, 96).

3.3.4 Adaptive co-management approach applied to biosphere reserves

Essential characteristics of ACM have been identified in BR management, and were applied to different extents in 146 BRs from 55 countries (Schultz *et al.* 2011). These include: "(1) involvement of both local inhabitants/communities and governments in decision-making (a defining condition for co-management); (2) conservation and sustainable development efforts pursued in concert (social-ecological system approach); (3) dialogue, collaboration, and integration of different objectives; (4) monitoring and responding to ecosystem feedback performed combining different knowledge systems, including science and (5) a shared vision has developed" (Schultz *et al.* 2011, 666). Though the ACM approach is not a prescriptive "blueprint" management approach to all BRs, implementation of the ACM practices (as defined above) has proven to be associated with higher levels of BR performance -specifically in achieving the sustainable development outcomes (Schultz *et al.* 2011).

3.4 Limitations of adaptive management and adaptive co-management

Over time, the implementation of the AM approach has revealed many barriers to its success. Distilling the large amount of literature on these barriers, Garmestani and Allen (2015) grouped them into seven categories: (1) lack of collaboration; (2) lack of funding; (3) lack of clear objectives; (4) lack of leadership; (5) lack of intermediaries; (6) inappropriate scale of projects (AM is inappropriate for large-scale projects); and (7) lack of a favorable institutional, policy and social environment. Hence, the selection of AM for environmental resource projects (e.g. PA management) requires prior assessment of existing barriers and/or enabling environments. The incapacity to address these barriers may make AM an inappropriate choice for the management of the related project (Garmestani and Allen 2015).

Similarly, the successful implementation of ACM for social-ecological systems' resilience has proven to require a specific set of conditions that create an enabling environment (Armitage *et al.* 2009). These include but are not limited to: (1) appropriate institutional arrangements and mechanisms (across multi-level governance systems), (2) capacity (knowledge and resources), and (3) explicit supportive policy environment at national and regional levels, cross scale exchange of knowledge (Armitage *et al.* 2009).

For these conditions to be met, there is need for commitment, motivation and belief in common goals, and incentives for stakeholders involved (Armitage *et al.* 2009). Moreover, the process is often lengthy, resource intensive especially when capacities for collaboration need to be developed, and requires institutional arrangements. Hence, the benefits of adopting and/or implementing AM and/or ACM approaches are often gathered in the long-term rather than immediately. Consequently, the investments needed in terms of time, costs, capacity-building, and infrastructure can sometimes decrease the momentum and lead to less successful ACM implementation, especially when incentives are low (Armitage *et al.* 2009).

AM and ACM approaches have faced many failures and criticisms, but remain at the forefront of social-ecological resources management. The main reason for their persisting value is their yet unmatched potential to positively impact resilience of socio-ecological systems (Garmestani and Allen 2014, 2015). However, AM and ACM are not "one-size-fit-all" solutions, they are most likely to succeed when the scale and the conditions are appropriate, and the context is (made) favorable (Garmestani and Allen 2015; Armitage *et al.* 2009).

3.5 Summary

The theory of resilience of social-ecological systems was born out of the need to increase the capacity of social-ecological systems to adapt to rapid change and high levels of uncertainty (Holling and Sundstrom 2015). In an effort to increase resilience, conceptual approaches that guide practical management of complex social-ecological systems were developed and tested in the management of PAs and BRs. The resulting AM and ACM approaches are proven to enhance management effectiveness of BRs and are hence recommended (Bioret *et al.* 1983; Schultz *et al.* 2011). On this basis, AM and ACM are adopted as theoretical underpinnings to inform the methodological approaches for the research, and ground the analysis of findings and development of recommendations. The following Chapter provides details on the research design and methodology.

CHAPTER 4: RESEARCH METHODOLOGY

Chapter 4 presents the research design and its detailed systematic approach composed of five phases. It then details methods selected for each phase of the research by providing a clear rationale for their selection, a description of their implementation, in addition to respondent characteristics and methods of analysis. Integrated in this Chapter, is a detailed presentation of the newly developed adapted set of indicators for biosphere reserve management effectiveness evaluation named the *BREMi* Framework in reference to *Biosphere Reserve Evaluation of Management indicators*.

4.1 Research design and methodological approach

The study is primarily cross-sectional in nature, but considers historic trends and processes in BR development and implementation in the Arab region (de Vaus 2002). Moreover, the study combines descriptive and analytical research using four main methods: (1) informal interviews, (2) survey research, (3) document review, and (4) in-depth interviews. The mixed methods and data collection tools have been selected in a manner that allowed for a collection of the appropriate degree of relevant qualitative and quantitative data for addressing the 5 research questions (Section 1.4.1) as summarized in Table 14. Methods for data analysis i.e. *how the research question is answered*, will be detailed later in the Chapter.

Table 14: Summary of methods used to collect data for addressing each Research Question (R.Q.)

R.Q.	Research methods and corresponding Phases	Main tool used for data collection	Means of data collection	Type of data collected
How can the BR concept implementation and management effectiveness be improved in the Arab Region?				
Q1	Informal interviews (Phase 1)	Unstructured question/s	Email/Skype	Qualitative
Q2	Online survey (Phase 2)	Survey protocol/Indicators	Web-administration using *survey software*	Quantitative and Qualitative
Q3	Online survey (Phase 2)	Survey protocol/Indicators	Web-administration using *survey software*	Quantitative and Qualitative
	Document review (Phase 3)	(*N.A.*)	Email	Qualitative

R.Q.	Research methods and corresponding Phases	Main tool used for data collection	Means of data collection	Type of data collected
Q4	Online survey (Phase 2)	Survey protocol/ Indicators	Web-administration using *survey software*	Qualitative and Quantitative
	In-depth interviews (Phase 4)	In-depth interview protocol	Face-to-face interviews	
Q5	Synthesis of findings and development of recommendations (Phase 5)			

Note: Refer to Section 1.4.1 for R.Q.s

The use of these selected methods for data collection was carried out in a consecutive way through five phases leading to the final resolution of the overarching research question, and completion of the research. The first phase - addressing Q1 - consists of targeted online *informal interviews* of experts who have already conducted and/or published global MEE surveys, or have direct involvement in studying BRs, protected areas, and their management. The second phase consists of online *survey research* and allows for collecting primary quantitative and qualitative data on BRs, which helps address Q2, Q3, and partially Q4. Phase 3 complements Phase 2 in addressing Q3 through *document review* of available PR reports of Arab BRs. The fourth phase includes *in-depth interviews* with official representatives from selected Arab BRs to gain a deeper understanding of the specific contextual factors that impact BR management performance in ArabMAB as compared to factors identified in global studies. Phase 4 complements the survey findings for comprehensively responding to Q4. The fifth and final phase consists of *synthesis and reporting* of main findings, based on which recommendations are developed for the improvement of management effectiveness of ArabMAB. This integrated 5-phase approach is presented with more details in the next Section.

4.2 Systematic and adaptive approach to research

The research utilized a systematic approach with a detailed action plan presented in Table 15. Actions were achieved chronologically (with a small degree of overlap) towards the completion of the research and dissertation. In addition, the methodology was adaptive in nature, allowing each phase's results to inform the next phase. Hence data collection, analysis and interpretation of findings were completed individually for each phase before progressing to the following one. This adaptive and iterative approach proved to be an efficient way to tackle the research questions by allowing constant learning, and adaptation of research design to findings. Results obtained from each phase helped refine and adapt methodological tools in order to better address the set research questions.

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Table 15: Detailed action plan illustrating the systematic and adaptive approach to the research

PHASE 1: INFORMAL INTERVIEWS
Identify main researchers in published global surveys on PA/BR MEE
Conduct informal interviews online
Data transcribing, coding and interpretation for initial results
Conduct follow-up interviews
Data transcribing, coding and interpretation of completed results
PHASE 2: ONLINE SURVEY
2.1 Planning and implementation
Draft a *survey protocol* based on the research questions, objectives, and Phase1 results
Select an online software and integrate the *survey protocol* into the selected online platform
Contact UNESCO-MAB Secretariat and request a letter supporting access to BR data
Identify appropriate survey respondents after iterations with regional networks
Pilot-test and finalize the online *survey protocol*
Translate the *survey protocol* to French and Arabic
Develop collaboration with a regional organization for data collection support
Collect data across the ArabMAB Network's region
2.2 Results processing, analysis and reporting
Compile collected data from the online survey
Translate all data to *English*
Clean and analyze data
PHASE 3: DOCUMENT REVIEW
Collect PR reports completed by the ArabMAB Network
Select analysis method to best address RQs and objectives
Interpret results in light of the research questions and available literature
PHASE 4: IN-DEPTH INTERVIEWS
3.1 Preparation and implementation
Identify research needs based on findings of the 3 previous phases and RQs
Develop the in-depth interview protocol
Plan study trip for data collection (target interviewees, logistics, resources)
Identify relevant interviewees and plan face-to-face meetings for interviews
Conduct in-depth face-to-face interviews
3.2 Data analysis
Translate all collected data to *English*
Clean, synthesize and present data
Interpret findings
PHASE 5: SYNTHESIS OF FINDINGS AND RECOMMENDATIONS
Develop general conclusions and recommendations
Complete the research and dissertation
Share results with respondents

4.3 Phase 1: Informal interviews

4.3.1 Informal interviews objective

The *informal interviews'* main objective was to identify reasons for the paucity of published information on Arab BR and PA management effectiveness in general. This information, in turn, would allow anticipation of potential obstacles to be faced in the survey data collection, and hence a timely adaptation of methods and tools.

However, the *informal interviews* were more informative than anticipated, due to a high expressed interest from approached experts to informally communicate their opinions of the underlying reasons for missing information about BRs in PA datasets and reports. Hence, the "conversation" took an interesting turn towards conceptual and institutional challenges and gaps that influence the alignment of the 2 concepts of "BR" and "PA", and hence their presence in global and regional publications. From that perspective, the *informal interview* method served beyond its original objective, allowing for a deeper look into the conceptual nuances and existing gaps between PAs and BRs systems at the design and implementation levels, including potential implications.

4.3.2 Informal interviews design and data collection

The *informal interviews* were intentionally brief and straightforward (Phase 1 in Table 15) to maximize the response rate. Informal discussions with unstructured questions around Q1 were carried out via email and/or Skype, with leading experts of published global studies on PAs and BRs, and project managers in recognized institutions involved in the development or management of reference global databases for PAs and BRs (Section 4.3.3).

Informal inquiries during the interviews were directed toward identifying *how* the experts collected their global data; *what* were the response levels from the Arab region; *what* challenges or obstacles to research (if any) they specifically faced in the Arab region; and *what* are their opinions or insights about the reasons for paucity of published studies on Arab PAs and BRs specifically compared to other regions. The number of questions and exact formulation were customized to each respondent's background. Hence there was no standard *informal interview* protocol. Further to sending emails, two respondents expressed interest to discuss the topic through voice conversation, and were consequently informally interviewed via Skype calls. After the first set of data was collected and analyzed, follow-up questions were developed with

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the objective of complementing the results of the first analysis, and gaining a deeper understanding of the identified gaps.

4.3.3 Informal interviews response levels

Eight solicited experts responded to the *informal interview*, 5 in the first part (2 from the same institution), and 3 in the second part. The first batch of interviews targeted the known authors and experts in the field with specific questions pertaining to their research on BRs/PAs and projects of relevance to Q1. On the other hand, part 2 consisted of interviews with experts and authorities that could complement the missing information or answer new questions raised by the initial results. The institutions that were targeted in the first and second parts of the informal interviews are presented in Table 16.

Table 16: Informal interview institution

Informal Interview	Institution (7)*	Link to research
Part 1	University of Greifswald, Germany	Governance of Biodiversity (GoBi) Project
	UNEP-World Conservation Monitoring Centre (WCMC)	1) World Database on Protected Areas (WDPA)
		2) Protected Area Management Effectiveness Information Module developed based on the Global Study
		3) Protected Planet report
	The University of Queensland, Australia	The global analysis of protected area management effectiveness research (Global Study)
	UNESCO-Man and Biosphere Program	1) MAB International Advisory Committee for BRs (IACBR) Member
		2) ArabMAB Bureau
Part 2	Research Equilibrium	Research expertise and collaboration with IUCN and UNESCO on Protected Areas, World Heritage Sites and Biosphere Reserves
	UNESCO MAB Secretariat	MAB constituencies and highest level of governance for ArabMAB
	IUCN Cairo Office	Previous Technical Advisor and Co-Manager of IUCN projects in Egypt (2005-2008)

*There were 8 respondents from the 7 institutions

During the course of the interview, a few experts shared relevant literature and unpublished data including reports (Dudley 2012) and research protocols used for their surveys on BRs (Dudley 2012; Stoll-Kleemann 2005, 2007). These additional documents provided useful input for the survey research, especially for designing the *survey protocol*.

4.3.4 Informal interviews data analysis

Collected qualitative data from *informal interviews* was analyzed using a simplified version of the *thematic content analysis* method adapted from the grounded theory approach (Glaser and Strauss 1967) and works on content analysis (Babbie 1983; Berg 1989; Fox 1982). This method, summarized by Burnard (1991) aims to identify themes in individual responses, and then identify common themes that would lead to headline categories. Though it accounts for respondents' perceptions, the method assumes that it is acceptable to compare the responses of different persons and classify them as common, regardless of their specific worldviews (Burnard 1991). Following is a detailed explanation of the analysis method.

- **Step 1: Open Coding**

Most collected data consists of short written answers that were printed out and treated as transcripts, except for the two Skype interviews that were actively transcribed from notes and recordings. The transcripts were then read through several times and key sentences capturing all aspects of the content were re-written, while filtering out unusable "filler" information termed *dross* by Field and Morse (1985). Data that was part of the informal discussion but irrelevant to the interview purpose, was considered *dross* as well and eliminated at this stage. This step called "open coding", generated a synthesized shorter version of transcripts.

- **Step 2: Categorization level 1**

During Step 2, the first level of categories was created using very simple sentences or statements that summarize the essence of the summaries obtained in step 1. Categories were created in a way that would preserve all the content of transcripts while organizing them in the perspective of answering the addressed research question (Q1).

- **Step 3: Categorization level 2**

Categories 1 were grouped into higher-order categories by collapsing those that are similar into broader categories while standardizing their designation. Hence this second list of categories produced a shorter broader list of categories using a standard lexicon.

- **Step 4: Collapsing and standardizing categories**

Step 4 involved repeating the previous step by collapsing a few similar categories and grouping them into broader thematic categories.

- **Step 5: Final unified standard list of categories**

Step 5 produced a final unified list of categories by doing a final grouping of repeated themes into a unified designation and rating its frequency of occurrence. This final list of thematic categories was named "identified challenges" in reference to Q1.

4.4 Phase 2: Online survey

In the second phase, the *survey research* method was utilized with the BR management staff representatives (senior staff from the BR official managing authority) selected and validated with the help of UNESCO-MAB offices and IUCN Mediterranean (IUCN-Med) regional office's North Africa program Coordinator. Though not clearly anticipated during the study design, there was no access to the Lajat BR in Syria at the time of data collection, due to the severe armed conflict on its territory. Hence the country was excluded from the study population reducing it to 25 BRs in 10 countries. The survey aimed at addressing Q2 and Q3, while partially addressing Q4 (Section 1.4.1 and Table 14).

4.4.1 Survey method definition and relevance

A survey is a quantitative method taking many cases that share one or many common characteristic(s) - in this case "UNESCO BR of the ArabMAB Network" -collecting data about these cases in a structured systematic way, analysing the obtained data, and looking at trends and correlations between variables (de Vaus 2002). For instance, in this study, relationships between MEE indicator scores and average MEE scores were analysed to determine which factors most strongly and significantly influence BR management effectiveness performance.

The survey research method is a *positivist methodology*. In the case of this study, it followed a *correlation design* to deduce results on how different dependent variables (e.g MEE scores) relate to the independent variables (e.g. date of designation) (de Vaus 2002). Underlying assumptions to *survey research* relate to the positivist view, which aligns itself with the natural sciences assumptions that only what is grounded in experimental observations can count as valid (Travers 2001).

4.4.2 Survey protocol

The tool used for the survey research is the *survey protocol* composed of closed and open-ended questions, allowing for the collection of quantitative and qualitative data.

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4.4.2.1 Background frameworks

The *survey protocol* was developed based on two main frameworks: (1) the WCPA Framework (Hockings *et al.* 2006), which constitutes the "backbone" of the analytical framework (i.e. CRF); and the AM conceptual framework. New elements relating to adaptive management as well as to the specific characteristics of the BR concept were incorporated into the analytical framework (indicators), creating a novel adapted version of the CRF/Headline Indicators named *BREMi* (*BR Evaluation of Management indicators*).

4.4.2.2 Survey protocol development

Several drafts were developed and reviewed by experts before reaching the final version of the *survey protocol*. In addition, two studies' questionnaires collected through the informal interviews (Phase 1) - though different in their scope - provided insights for improving the survey protocol and avoiding overlap. These included the survey protocols of the GoBi project and of the unpublished *BRs in Vietnam: a first assessment of their values and management effectiveness* report (Dudley 2012). The final draft of the protocol was pilot-tested using the selected online administration method (Section 4.4.3.1) to ensure clarity and technical validity. In order to test the degree of understanding of the protocol by respondents regardless of level of expertise in the subject, the pilot test was conducted with (1) an academic professor in the field of conservation; (2) a research peer who is not familiar with the topic; and (3) an employee of an environmental/conservation NGO in the Arab region (not participating in the actual survey). "Test respondents" were asked to give feedback on clarity, simplicity, length and flow of the survey protocol. Collected feedback was utilized for refining the protocol (Appendix 2.2 for the final original version).

Since language was frequently mentioned in Phase 1 interviews as one of the main factors that prevent access to information in the Arab region, the full range of language options that respondents could be comfortable with was provided. Of most interest is the inclusion of the native *Arabic* language, which has never been used in previous BR surveys in the Arab region[14]. After validating and finalizing the survey protocol in *English*, it was translated to *French* (Appendix 2.3) and *Arabic* (Appendix 2.4). These are the main formally used languages in the studied region with a tendency for North Africa to prefer *French*, Levant and Gulf countries

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[14] Statement based on the literature review and personal communication during the informal interviews

English, and Sudan and Yemen *Arabic*. Language preference relates to the colonization history of the region and current educational and professional systems in place.

4.4.2.3 Survey protocol design

The *survey protocol* is composed of 26 questions including open-ended, and closed-ended, with the following question types: ranking, scoring, Likert scale, and multiple choice. Question order was defined by a logical sequence marked by two *filter questions* (Table 17 and Appendix 2.2). Question structure and terminology were carefully selected for simplicity, conciseness and clarity. As mentioned earlier, these aspects of the protocol were validated through pilot testing and iterations with different subjects (non-respondents) (Section 4.4.2.2).

4.4.2.4 Survey protocol content and structure

The content of the *survey protocol* was developed in light of the research questions and using elements from the relevant analytical and theoretical frameworks i.e. CRF and underlying WCPA Framework, and AM theoretical framework. Table 17 provides a detailed explanation of the rationale for the *survey protocol* content and structure.

Table 17: Survey protocol structure and content rationale

Survey question number*	Theme covered	Objective of question	Related research question**	Related research objective	Background frameworks
1 to 4	Background	Collecting general demographic information about the respondent and BR surveyed	Not specific/All	N/A	N/A
5	BR concept	Evaluating the perception/understanding of the BR concept in terms of functionality	Q2	O2	N/A
6 to 8	Governance	Identifying the governance type as well as the relationship between different governance levels	Not specific/All	O5	N/A
9	Research	Assessing international interest in researching BRs of the Arab region	Q1	O1	N/A
10	Management	*Filter question* identifying BRs without operational management and excluding them from the MEE (remaining questions)	Not specific/All	O5	N/A

Survey question number*	Theme covered	Objective of question	Related research question**	Related research objective	Background frameworks
11 to 12	BR concept	Assessing the BR functions' implementation and testing for alignment with perception/ understanding	Q2	O2	N/A
13 to 15	Governance	Identifying type of governance and collecting general information about the managing institution	Not specific/All	O5	N/A
16	Management Effectiveness	*Filter question* 1. Identifying BRs that have never conducted MEE(s) and filtering them out from the next set of questions (17-20) 2. Assessing the perceived importance of MEEs	Not specific/All	O4	N/A
17 to 20	Management Effectiveness	Assessing the *Monitoring and Evaluation* process and its level of integration into the BR Management Cycle	Not specific/All	O5; O6	AM
21	Management Effectiveness	Assessing the initial perception of management effectiveness/ performance	Q3	O5; O6	N/A
22	Management Effectiveness	Assessing the perceived weight/importance of the 6 WCPA elements relative to management success	Q3; Q4	O8	HIs /WCPA
23	Management Effectiveness	1. Conducting a full quantitative self-evaluation based on standard adapted indicators 2. Identifying country and region-specific indicators of importance	Q3; Q4	O4; O6; O7; O8; O9	AM HIs /WCPA
24	Feedback	Collecting feedback on positive and negative aspects of the survey protocol that would: 1. Reflect the perceived importance of MEE, and 2. Help recognize the limitations of the tool	Not specific/All	O4	N/A

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Survey question number*	Theme covered	Objective of question	Related research question**	Related research objective	Background frameworks
25	Follow-up	Identifying BRs interested in more in-depth analysis (Phase 4)	Q4	O9	N/A
26	Confidentiality	Ensuring informed consent for publishing names/titles	Not specific/All	N/A	N/A

* Appendix 2.2; ** Section 1.4.1
N/A= Not Applicable; HI= Headline Indicators; AM= Adaptive Management; WCPA=World Commission on Protected Areas

An introductory letter ensuring anonymity and confidentiality (unless stated otherwise by survey respondents) preceded the *survey protocol* when it was administered (Appendix 2.1). Hence, Q26 at the end of the *survey protocol* (Table 17) aimed at giving respondents the choice to approve (or disapprove) anonymity and confidentiality of the data collected.

4.4.2.5 Criteria and indicator development

▪ **Baseline assessment of BR concept implementation and management approach**

In order to explore the extent to which "the baseline aspects of the BR concept and related management approach" are applied in Arab BRs, a set of 10 criteria has been developed based on established definitions, best practice, and guidelines reviewed in the literature. The criteria were used to assess the aspects that most define and differentiate the BR as a concept -and associated management approach- from other types of PAs. These aspects were defined as: (1) functional zonation scheme (at the levels of planning and implementation); (2) participatory management; (3) collaboration and partnerships. Moreover, based on the research finding in Phase 1 pertaining to conceptual gaps (Section 5.1.6), a criterion to assess the extent to which the BR is a "paper BR" (i.e. a designation on paper with no management implications) was added to the 10 criteria. Hence the fourth aspect assessed is: (4) differentiation from a PA. Table 18 presents the 11 criteria with the associated aspect of BR concept and/or management approach assessed.

Table 18: Baseline assessment criteria and corresponding aspect of a BR

	Criteria	Aspects*
1	The 3 zones (core, buffer, transition) are well delineated and defined	1, 4
2	Although designated as a BR, the site is only managed as a protected area based on national designation(s)	4
3	The management plan defines strategies and actions for each zone	1, 4
4	Conservation of natural value activities take place mainly in the core zone	1
5	Sustainable/eco-friendly development activities take place mainly in the buffer and transition zones	1
6	The site is used for environmental research and monitoring	1
7	There are on-going environmental educational activities in the BR	1
8	Partnerships have been developed with local community stakeholders	2, 3
9	Collaboration with other BRs is taking place	3
10	Local communities participate in management decisions	2
11	Partnerships with experts and research institutions are established	3

*1=functional zonation scheme; 2=participatory management; 3=collaboration and partnerships; 4=differentiation from a PA at the planning and management levels.

Although each criterion is reflective of mainly one or two main aspects of the BR concept/management, most of them reflect to a lesser degree the other aspects evaluated. These criteria are neither comprehensive, nor exclusive in nature, they just allow for a very rapid and brief assessment of BR concept implementation and management approach.

As part of the *survey protocol* (Q12) (Appendix 2.2), each BR representative was asked to rate the applicability of these 11 criteria to their BR on a 4-point Likert scale where 1 means "strongly disagree", and 4 "strongly agree". Respondents were also given the option of "not applicable". To make the criteria simpler, they were formulated as positive statements whereby each statement reflects a "positive implementation" of the BR concept and management approach. The only exception for this "positive polarization" is for the criterion (2.) assessing differentiation of the BR from a PA at the management level, i.e *although designated as a BR, the site is only managed as a protected area based on national designation(s).* This positive statement reflects a "negative implementation" of the BR concept and management approach, and is therefore interpreted from this perspective in the survey results.

- **MEE analytical framework selection and relevance**

In order to select the most appropriate instrument for this study's evaluation of BR management effectiveness, widely used PAME evaluation tools for rapid assessment were reviewed15 (Section 2.2.3) in addition to the BR evaluation tool (Section 2.3.6.2). These include:

- METT: Management Effectiveness Tracking Tool;
- RAPPAM: Rapid Assessment and Prioritization of Protected Area Management;
- mTRA: modified Threat Reduction Assessment;
- CRF: Common Reporting Format composed of the 33 HIs;
- PR: PR Form[16] specific to BRs.

Based on this review, the CRF Framework (Table 3) was selected as the most relevant and updated framework of indicators to be used as a baseline for the development of a new adapted analytical framework specific to BR assessment. The selection of the CRF framework is based on the following factors:

- Provides the first integrative and simplified form of unified set of indicators based on a review of >50 different methodologies;
- Relevant to the theoretical frameworks (AM and ACM theories) which integrates a process of continuous evaluation and monitoring of management performance (Sections 3.2, 3.3);
- Relevant to the research questions by addressing Q3, and partially Q4 (Section 1.4.1).
- Presents the following advantages compared to other reviewed tools:
  - ✓ *Synthetic and standardized*: Leverington and colleagues (2010a, 2010b) have conducted the most comprehensive review - to date - of existing MEE reports and tools globally and have derived this tool as the most synthetic and representative one.
  - ✓ *Comprehensive*: The 33 indicators are inclusive of the 6 elements of the WCPA Framework (context, planning, process, input, output, outcomes), which is recommended as an underlying framework for all PAME evaluations (Hockings 2003).

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[15] Only rapid assessment and evaluation tools were considered (in contrast with long-term monitoring and evaluation tools) due to their appropriateness and relevance to this research's aims and available resources.

[16] The old version of the PR template was reviewed and utilized during the course of this research, which was designed and started before the publication of the 2013 version of the PR report by UNESCO-MAB Secretariat. Though the first version was developed in 1996, only a 2002 version was found in the Archives and utilized in this study.

✓ *Practical*: Since it is simplified, the CRF/HIs used as a tool - is easier to understand and complete than elaborate methods such as METT. Hence, the response rate is expected to be higher when using it compared to longer and more complicated tools.

✓ *Purposeful:* In the scope of this research, the use of the same tool (CRF) as the one used to retrieve Global PA results in the Global Study allows for statistical comparison of this research's results with the Global Study findings, therefore allowing the response to research Q4.

On the other hand, the 33 HIs of the CRF have been developed for all types of PAs on a global level, and hence lack specificity. In the perspective of this research, one of their limitations (if used as such) is that they don't account for the special characteristics of BRs that go beyond (or sometimes differ from) a PA. To respond to this limitation, the developed indicators have been adapted to the BR concept. In addition, the relevance of indicators in the specific context of the Arab region was considered through subjecting the final framework to review by a local expert.

▪ **The BREMi Framework: An adapted list of indicators for biosphere reserve management effectiveness evaluation**

The HIs - as their title indicates - provide a series of (33) indicator categories (Table 3) that have been deduced from worldwide methodologies used for PAME evaluations (Leverington *et al.* 2010b) (Section 2.2.3). They are not indicators *per se*, rather they provide guidance for developing adapted indicators to individual PAs or PA systems (Leverington *et al*. 2010a). In the framework of this research, indicators have been developed under each HI category, while referring to the common original WCPA Framework developed by Hockings and colleagues (2006) in *Evaluating effectiveness: A framework for assessing management effectiveness of protected areas*. The adaptation of the developed indicators to the specific case of this research essentially entailed the incorporation of aspects of AM theory and of the functional zonation scheme of BRs, as well as crosschecking the contextual relevance of those indicators to the Arab region with a local expert. The final indicators were stated in the format of full sentences polarized toward effectiveness, to enhance clarity and meaning and facilitate scoring (Table 19).

A total of 65 BR Indicators were developed on a canvas of the 33 HIs, with the addition of one Headline Indicator that pertains to the "logistic support" function -specific to the definition of BRs- as part of the *Outcomes* category. This additional HI entitled "Education, Research and

Monitoring" (F3 in Table 19) emphasizes the importance of this logistic function of a BR, which is not mentioned as part of outcome indicators in the Common Reporting Format for PAs in general (Table 3). The newly developed list of 65 indicators has been named the BREMi Framework, (Table 19), while the 34 headline indicators used in this research will be designated BHIs in reference to *BREMi Headline Indicators* in order to distinguish them from the 33 HIs of the CRF (Leverington *et al.* 2010b). The total numbers of BHIs (34) and of indicators developed under all BHI(s) (65) were guided by a minimum level of information needed for a comprehensive assessment of BR management effectiveness. Hence, the comprehensive list of indicators covers the complex structure (triple zoning) and functions (conservation, development, and logistic support) of BRs.

Note that the BHIs titles, codes, and related WCPA elements (Table 19) were not disclosed to respondents in the *survey protocol* (Appendix 2.2, Q23) to avoid unnecessary confusion, but they were used for analytical purposes.

Table 19: The BREMi Framework

Element	BREMi Framework (34 BHIs; 65 Indicators)
A. CONTEXT	
A.1	Level of significance (values)
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 favourable to management success
A.3.2	National authorities and leaders are supportive
A.3.3	Local community and civil society is supportive
B. PLANNING	
B.1	Protected area gazettal
B.1.1	Core zone(s) are gazetted (designated by law) nationally
B.1.2	Buffer zone(s) are partially or fully gazetted nationally
B.2	Legislation and policy framework
B.2.1	National protected area legislation is inclusive of BRs
B.2.2	Land use planning authorities account for the BR
B.3	Tenure issues
B.3.1	Land ownership status and related issues are well known
B.3.2	Issues of land tenure are accounted for in planning
B.4	Marking and security or fencing of boundaries
B.4.1	Core Zone(s) boundaries are known and demarcated (map/signage)
B.4.2	Buffer Zone(s) boundaries are known and demarcated (map/signage)
B.4.3	The Transition Zone boundary is known
B.5	Appropriateness of design (for BR functions)
B.5.1	Size and zoning are appropriate to the conservation of significant values
B.5.2	Size and zoning are adequate to conservation, development and research
B.6	Management planning
B.6.1	A Management Plan for the BR site is developed and adequate
B.6.2	Resources needed to reach set management objectives are defined
B.6.3	Management targets specific to the site values are determined
B.6.4	Indicators to monitor progress towards set targets are developed
B.6.5	Periodic Review and updating of the Management Plan is scheduled

Element	BREMi Framework (34 BHIs; 65 Indicators)
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
C.2.1	Funds necessary to reach set management objectives are available
C.2.2	Available funds are allocated based on management objectives
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
C.4.1	Appropriate vehicles, equipment 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. PROCESS	
D.1	Effectiveness of governance and leadership
D.1.1	Governance type of the BR is adequate
D.1.2	Governance systems are free from corruption
D.1.3	Leadership is effective and adequate
D.2	Effectiveness of administration including financial management
D.2.1	Administrative/financial processes are adequate and effective
D.3	Management effectiveness evaluation undertaken
D.3.1	Management effectiveness evaluation is undertaken
D.3.2	Staff meetings are used for learning and adapting
D.4	Adequacy of building and maintenance systems
D.4.1	Maintenance of equipment and infrastructure is adequate
D.5	Adequacy of staff training
D.5.1	Training is adequately provided for staff based on needs
D.6	Staff/other management partners skill level
D.6.1	Expertise and skill level of staff and partners are adequate
D.7	Adequacy of human resource policies and procedures
D.7.1	Management policies and procedures are defined and adequate
D.8	Adequacy of law enforcement capacity (by staff mainly)
D.8.1	Staff is capable of enforcing policies and laws inside the BR
D.9	Involvement of communities and stakeholders
D.9.1	Stakeholders are involved in planning and decision-making
D.10	Communication program
D.10.1	Effective means of communication are used with stakeholders
D.10.2	An environmental awareness and education program is in place

Element	BREMi Framework (34 BHIs; 65 Indicators)
D.11	Appropriate program of community benefit/assistance
D.11.1	Community use of natural resources is identified
D.11.2	Projects and activities of direct community benefit are in place
D.12	Visitor management (visitors catered for and impacts managed appropriately)
D.12.1	Ecotourism visitors are well catered for
D.12.2	Visitors' impacts on values are controlled
D.13	Natural resource and cultural protection activities undertaken
D.13.1	Activities to conserve natural resources are implemented
D.13.2	Activities to protect cultural resources are implemented
D.14	Research and monitoring of natural and cultural management
D.14.1	Relevant research on natural and cultural values is undertaken
D.14.2	Condition/trends in the state of biodiversity values are monitored
D.14.3	Condition/trends in the state of cultural values are monitored
D.15	Threat monitoring
D.15.1	Major threats are monitored and reported
E. OUTPUTS	
E.1	Achievement of set work program
E.1.1	Planned targets/objectives are being achieved
E.2	Results and outputs 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 conserved
F.1.3	Threats to nominated values are controlled/reduced
F.2	Effect of BR management on local community
F.2.1	The BR socio-economically benefits local community
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

Note: Color code: Grey= WCPA Framework's element group; Green= BHI

In contrast to the Global Study score interval of 0 to 1, respondents were asked to allocate a score to each and all 65 indicators on a scale from 0 to 10, where 0 represents the lowest score (no management/no progress) and 10 represents the best score (excellent management/ideal situation). The 0-10 scale was selected to allow for (adjusted) comparison with the results of the Global Study that used a 0-1 scale on the CRF indicator framework. In addition to scoring, respondents were asked to assess the relative importance of each indicator (65) to their BR management effectiveness, by assigning a "yes" value for "indicator is relatively important to

effective management", and a "no" value for "the indicator is relatively not important to effective management" (Appendix 2.1).

- **BREMi evaluation differentiation from periodic review evaluation**

As mentioned earlier, the PR Form (Appendix 1.1) is one of the tools reviewed for the selection of an optimal framework for BR MEE in this study. In that perspective, the PR tool was found to be a rather weak tool for that purpose, as it doesn't specifically assess <u>performance of management,</u> but focuses on collecting descriptive qualitative information about the BR context and implementation. The BREMi Framework remediates this gap by integrating criteria used by UNESCO-MAB authorities for BR appraisal in the PR form, in addition to other relevant standard indicators identified through global studies on PA and BR management effectiveness (Leverington *et al.* 2010b; Stoll-Kleemann 2007). Table 20 provides a summary of the main differences between BR evaluations utilizing the PR Form as compared to utilizing the BREMi tool, hence highlighting the unique value of the innovative BREMi Framework (65 indicators).

Table 20: Comparison of PR and BREMi-based evaluations of BR(s)

Biosphere Reserve Evaluation	
PR Form (2002 version)	**BREMi Framework**
Self-evaluation	Self-evaluation
Qualitative	Quantitative*
Description based	Result/Action based
BR *concept implementation* focused	*Management effectiveness* focused, integrating BR conceptual aspects
Description of present BR status; i.e. answers the question: *what have you been doing so far?*	Assessment of gap toward desired "optimal" BR status; i.e. answers the question: *how far are you from doing your best?*
Built on conceptual definition of BR	Built on accumulated evidence of success factors for BRs
"Past to present" focus	"Present to future" focus
Evaluation unit is the BR	Evaluation unit is the BR Managing Organization

*Can be complemented with qualitative data for explanation /justification

As shown in Table 20, in terms of *Monitoring and Evaluation* of BR management effectiveness, the BREMi Framework supersedes the PR Form (2002) by covering critical aspects of management that are not directly addressed by the PR process. Examples include "political support at the regional level" and "absence of corruption" for governance; as well as "leadership", "evaluation for adaptive management" and "law enforcement" in management;

all of which are proven factors to critically impact BR effectiveness (Table 5) (Stoll Kleemann 2007). These factors have been incorporated as indicators A.3.1, D.1.2, D.1.3, D.3 (both D.3.1 and D.3.2), and D.8.1 respectively in the 65 BREMi indicators (Table 19).

4.4.3 Survey implementation

4.4.3.1 Administration method

Online or web-administration was selected as the most effective method for this survey since the researcher couldn't physically access 10 countries, and the targeted audience has generally decent access to the Internet. In addition, online survey software presents many benefits (de Vaus 2002):

- Cost-effective
- Automated built-in filtering
- Reduction of non-response to required questions by prompting respondents
- Error and consistency checks
- User-friendly and engaging layout
- Interactive and attractive design

Several open-source survey software were reviewed before final selection of Survey Gizmo®. The choice was based on design features that were particularly appropriate to the survey protocol question types, in addition to cost-effectiveness[17], and the collection of datasets in Excel and SPSS compatible formats. After constructing the protocol online, it was pilot-tested, refined and updated in *English* and *French*, before a link to the final survey protocol was sent by email to the identified BR representatives. The email included an introductory letter explaining the research background, ethical considerations, and procedure for completion (Appendix 2.1). A printable version was provided as an alternative to be filled by hand and returned by email. The *Arabic* version (Appendix 2.4) was sent only by email (printable form) due to technical difficulties related to the language in the online software.

4.4.3.2 Survey data collection

Remote collection of data is framed with challenges of access and responsiveness, especially when the target population is not personally familiar with the researcher, which was the case with North Africa. The first attempts to contact local authorities in the region of North Africa

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[17] The service is provided at a discounted rate for students

proved to be challenging, hence collaboration with the regional IUCN organization for the Mediterranean was sought to facilitate the process.

The IUCN-Mediterranean (IUCN-Med) office holds a North Africa program that concentrates on conservation and development in the region and works closely with PA and BR managers and central authorities. As part of its North Africa program, the IUCN-Med has already organized two expert meetings on *BRs Governance and Management*, during which capacity and management needs of North African BRs were identified and recommendations for future steps drafted (IUCN-Med 2012). Identified priorities included the need to evaluate BR management and governance, based on which a more concrete Action Plan would be developed to help BRs update their management plans and improve their effectiveness (IUCN-Med 2012). The long-term aim of this process is to enhance the current governance of North African BRs, and mostly guide the designation and management of future BRs (Mahjoub pers. comm.). In this perspective, when contacted to seek collaboration, the IUCN-Med North Africa program office expressed a great interest in the research, which was timely and in line with its working program. In that perspective the IUCN-Med office helped with contacting key informants and collecting data from the North Africa region.

Data was collected over a period of 4 months (November 2013 to January 2014) during which the IUCN North Africa Program Coordinator carried out the collection of data from Egypt, Tunisia, Algeria, and Morocco, in close cooperation with the researcher. Responses were directly received by the researcher, and not shared with the IUCN-Med office to respect confidentiality and anonymity. In parallel, the researcher directly surveyed the entire region of West Asia including Yemen, Lebanon, Jordan, UAE, and Qatar, in addition to Sudan, which falls outside the IUCN North Africa program scope (Sudan is outside the IUCN North Africa program's jurisdiction, it is considered a North African country in this research).

4.4.3.3 Survey response levels

The survey had a high response rate of 88% (22 of 25 BRs in 9 of 10 countries) distributed as shown in Figure 9.

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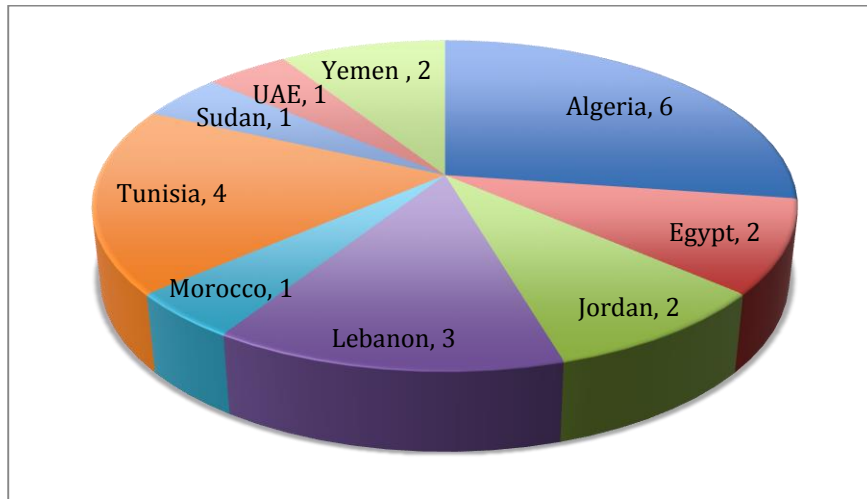
Fig. 9: Number of survey respondents per Arab-MAB country (N=22)

Non-respondents include Al-Reem BR in Qatar, one BR in Sudan (due to armed conflict in the country that prevented access), and another BR in Morocco. More information about response levels and characteristics are presented in Chapter 5.

4.4.3.4 Survey data analysis

Quantitative data was analyzed using IBM ® SPSS ® Statistics (ver. 20). Univariate and bivariate descriptive statistics were used, including measures of dispersion, central tendency, Pearson's Correlation to explore correlations between interval level variables, and ANOVA to compare means between various groups. Non-parametric tests including Spearman's Correlation and Kruskal-Wallis were used as alternative tests for Correlations and ANOVA respectively, when data did not meet the assumptions of the parametric tests (i.e. linearity, normal distribution). Significance was set at a 0.05 value for all tests.

Means of the 34 BHIs, 6 elements (of the WCPA Framework), and overall management effectiveness for each BR were calculated first. Overall scores were obtained by calculating the averages for the 34 BHIs results obtained for each BR. Moreover, *country BREMi scores* were calculated as averages of scores of all participating BRs from each country.

Descriptive statistics were conducted for all variables and measures of dispersion and central tendency were calculated. Means and standard deviations for each BHI and overall BREMi scores were calculated. The normal distribution of the data was then tested in order to establish if parametric tests could be used. Histograms, Normal Q-Q plots, and box plots were produced

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and the Shapiro-Wilk test was conducted to test for normal distribution at a significance level of 0.05 (Shapiro and Wilk 1965).

Pearson's Correlation was used in order to explore the strength and direction of the relationship between each BHI and the overall BREMi score, as well as each BHI with individual outcome indicators (i.e. outcome BHIs). The same test was used to explore the relationship between "start date of management" and BREMi score, as well as "staff numbers" (of the main managing institution) and BREMi score.

Item-total corrected correlations reliability test was used for more accurate measures of BHI correlations with total BREMi scores of BRs. Through this test, the total BREMi score is corrected so to exclude the score of each BHI tested. Then, the relationships between how individuals responded to each BHI are correlated with the corrected total score on the test. "This is an appropriate correction because total scores that have the item in question embedded within them will have a spuriously higher relationship (i.e. correlation) than total scores made up of only the other items in the test […]. There is no rule for how many items should be included before the item has little influence, so it is better to be conservative in the estimates and use the corrected score" (Kline 2005, 99). Moreover, the use of this test improves comparability of findings with the Global Study where the same correction was utilized to analyze relationships of indicators with mean PAME scores (Leverington *et al.* 2010b).

Spearman's Correlation was used for testing the correlation between individual BREMi scores of BRs and country HDI value because the data did not meet the assumptions of normal distribution for conducting the Pearson's Correlation test.

The **independent samples T-test** was used to:
- compare average regional BREMi scores of West Asia and North Africa;
- compare BREMi scores of BRs designated before and after the 1995 Seville Meeting;
- compare BREMi scores of BRs that have conducted a previous MEE vs. those that haven't.

The **dependent samples T-test** was used to assess whether there was a significant difference between the priorities ranking of each BR function based on respondent's perception as compared to actual implementation.

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ANOVA was conducted to compare mean scores of the six WCPA elements (context, planning, input, process, output, outcomes) across the various countries.

Kruskal-Wallis non-parametric alternative test to ANOVA was conducted when data was not normally distributed. Hence, it was used to compare mean BREMi scores of countries, and to test for significant differences in (1) BREMi scores across the various HDI categories of countries; (2) BREMi scores of countries across various HDI categories.

4.5 Phase 3: Document review

4.5.1 Definition and relevance

Document review is a means of data collection, consisting of reviewing existing documents or records. The documents can be internal to an organization or program, and usually not available to the public such as individual BR PR reports in the case of this research, or they can be internal and publically available such as the MAB MAP (2008). Documents collected can be electronic or hard copy and may include program strategies, reports, performance appraisals, project proposals, plans, meeting minutes, and promotional materials etc. (CDC 2009; W.K. Kellogg Foundation 1998). As a research method, *document review* is generally useful when:

- reviewing background information about a program being evaluated;
- information is needed to help develop other data collection tools;
- determining if a program implementation reflects program plans/constituencies;
- complementary data is needed to answer evaluation questions (CDC 2009).

The latter two objectives are most relevant to this research where document review method is used for the evaluation of completed PR reports for the ArabMAB Network.

In the scope of this research, the document review aimed at:

- Assessing the extent to which Arab BRs' managers understand the relevance of the PR process as a tool to assess their compliance with the BR concept (measured through the criteria of Article 4 of the *Seville Statutory Framework*).
- Complementing the survey method in addressing Q3: "How effective is the management of BRs in the Arab region" by tackling an underlying question on BR management evaluation: "how effective is the formal evaluation conducted by UNESCO-MAB" in the Arab region. In that perspective, evaluation is assumed to be an integral part of the management cycle and assessing its effectiveness is part of assessing management effectiveness (Section 3.2.3, and Fig. 8).

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Advantages of the document review method include: relative low costs; additional source of background information, unobtrusive, and its potential reference to issues not identified by other methods (CDC 2009). On the other hand, its main limitation is that written documents don't necessarily provide correct or complete answers to the specific questions at hand. For example, provided answers may be exaggerated, out-dated, incomplete or inaccurate (CDC 2009). Hence, document review is hereby used as one source of information in parallel to other methods (W.K. Kellogg Foundation 1998).

4.5.2 Data collection and analysis for document review

All PR reports from the ArabMAB region were directly solicited from: (1) UNESCO-MAB Secretariat through their focal point for the Arab region, (2) a Member of the ArabMAB Bureau and IACBR Committee, and (3) participants in the "in-depth interviews". Seven of 16 PR reports were accessed through this process- mainly from UNESCO-MAB Secretariat, including 3 from Algeria, 2 from Egypt, 1 from Jordan and 1 from Morocco. The 7 PRs accessed are in the version submitted to UNESCO-MAB Secretariat, and not inclusive of IACBR reviews and recommendations. They were analysed for their content in the perspective of compliance with UNESCO-MAB requirements laid out in Article 4 of the Seville Strategy Statutory Framework (Section 2.3.6.2). Accessed reports were all completed on the older version of the PR Form (2002). Analysis of content focused on 2 main aspects:

- Report quality was reviewed with the aim to reflect on the capacity of the BRs to complete the PR process in addition to the level of understanding of the reasons and benefits of the PR report in the Arab region. Quality was rated as: "good", "fair", or "poor" based on 3 criteria: comprehensiveness, readability and structure/format.
- Evidence of compliance with Article 4 assessed by reviewing Chapter 9 of each PR, which is specifically dedicated to addressing this question in the PR Form (Section 2.3.6.2, and Table 6).

4.6 Phase 4: In-depth interviews

4.6.1 Relevance and aim

The need for *in-depth interviews* was identified after the finalization of Phases 1, 2 and 3 (Table 15) based on the rationale that contextual qualitative data with stories from the field are essential to (1) complement and/or triangulate findings of Phases 1, 2 and 3 of the research; and (2) provide more detailed information using real examples concerning factors most influencing

management effectiveness of BRs in the ArabMAB context. Hence, the main purpose of conducting in-depth interviews was to gain a deeper understanding of the specific factors that determine management effectiveness of Arab BRs in their regional context. In addition, the in-depth interviews aimed at providing data for the comparative analysis of these identified factors with globally identified factors of BR success as defined in research question Q4.

4.6.2 Selection method of interviewees

Based on the defined aims of Phase 4, the most relevant identified interviewees were representatives from the main governance authorities of Arab BRs who participated in the survey (Fig. 1). The survey (Phase 2) findings revealed two main types of governance within the ArabMAB Network: (1) Government (68%), and (2) NGO/Co-managed (27%), in addition to "no management" for 5% of the cases (Chapter 6, Table 24). The selection of interviewees hence followed a *purposive sampling* method (Tashakkori and Teddlie 2003) targeting BR representatives from the different governance types and situation identified. In addition, in order to represent the diversity of BRs studied, which differ both in context and management effectiveness, interviewees were selected from different countries hosting BRs with a diverse range of BREMi scores based on Phase's 2 BREMi assessment results (MEE score categories).

4.6.3 In-depth interview protocol and analytical framework

The *in-depth interview protocol* was developed based on Phase's 4 aims. The protocol included two major parts, a short unstructured set of questions followed by a set of structured open-ended questions (Appendix 3). The unstructured (directive) part of the interview includes a few general open-ended questions regarding the interviewee's opinion on obtained self-assessment results, and the state of the MAB program in the country represented. The unstructured format helped establish a comfortable open dialogue. The second and main part of the interview protocol was structured/directive and included both closed and open-ended questions.

The list of *globally identified determining factors of success of BRs* (Table 5) was utilized as the background analytical framework for the structured part of the *in-depth interview protocol* because it provides:

- the only evidence-based list of "determining factors of success" of BRs identified to be "standard" to most BRs internationally;
- an opportunity for comparative analysis of regional results to globally identified factors of success of BR management, which is needed to address Q4.

4.6.4 In-depth interview data collection

Considering logistic and resource constraints, *opportunistic sampling* (Tashakkori and Teddlie 2003) was used as the optimal technique for data collection during participation in the World Parks Congress (WPC) held in Sydney (12-19 November 2014). The following approach was followed for conducting the in-depth interviews during the congress:

- Step 1: Self-introduction and briefing about the research in a face-to-face informal conversation;
- Step 2: Request of an appointment for an in-depth interview;
- Step 3: Starting the interview with a brief summary of research objectives, ethical considerations, findings to date, in addition to purpose and structure of the in-depth interview;
- Step 4: Conducting the interview using the *in-depth interview protocol* as a guiding framework, while probing the interviewee to facilitate the dialogue and seek more in-depth contextual information.

BR representatives from 4 of 9 countries participating in Phase 2 were interviewed in Phase 4: Algeria, Egypt, Lebanon, and Morocco. Interviews lasted 3 hours on average and were face-to-face at the WPC Congress venue. Algeria, Egypt and Morocco present a government type of governance; accordingly, government representatives responsible for PAs/BRs were interviewed for these countries. In contrast, Lebanon presents mainly an NGO-type of governance; hence the BR manager from Lebanon attending the WPC was interviewed (Table 5).

4.6.5 In-depth interview data analysis

Collected responses were directly typed or recorded on a voice-recording device, and later transcribed and analysed differently for the structured and unstructured parts of the protocol (Appendix 3). Indeed, for the analysis of data collected from the unstructured questions, the same method used for Phase 1 (informal interviews) data analysis was utilized i.e. *thematic content analysis* (Section 4.3.4). As for the data collected from the structured questions: the first set of closed-ended answers (Yes/No) were tabulated per country to identify trends and differences with the *list of global determining factors of success of BRs* adopted as an analytical framework, while the accompanying explanatory qualitative data were kept in the form of transcripts and used as examples for the interpretation of findings.

4.7 Ethical considerations

The research was approved through and adhered to the CEU Research Policy and Guidelines (CEU 2015). These included respect for free and informed consent, and respect for privacy and confidentiality.

4.7.1 Respect for free and informed consent

Before research began, of primary concern, was the need for free and informed consent of the research participants. In seeking informed consent, the following information was assured to each participant in *English*, *French*, or *Arabic* and in written form for the *survey protocol* (Appendix 2.1) and iterated orally to participants before the *in-depth interviews*:

- a statement that the study involves research;
- an explanation of the purposes of the research;
- the expected duration of the subject's participation;
- a description of the procedures to be followed in understandable terms;
- a description of any benefits to the participant(s), which may reasonably be expected from the research;
- an explanation of whom to contact (with contact details) for answers to pertinent questions about the research; and
- a statement that participation is voluntary (i.e. "an invitation").

4.7.2 Respect for privacy and confidentiality

All communication pertaining to the research follows accepted ethical standards, including:

- *Anonymity and confidentiality:* Results are presented in a grouped, not individual manner. All personal information provided by individuals are made anonymous whenever possible and remain confidential unless otherwise determined by the individual(s). A file containing names and any identification will be kept secure for 3 years after the termination of the research, after which they will be destroyed. Only the principal researcher (dissertation author) will have access to this file.
- *Priority of stakeholders involved:* Condensed results/recommendations from the research will be made available to the BR authorities who participated (i.e. BR managers, and IUCN-Med) upon completion of the research.
- *Respect*: Consideration for all participants is observed in all communication.

4.8 Limitations of research methodology

The following Section reviews some the main limitations identified for the research methods, and presents in parallel the strategies used by the researcher when possible to buffer potential biases arising from these limitations.

4.8.1 Limitations of interviewing methods

The *thematic content analysis* method used for interview data analysis in Phases 1 and 4 presents some weaknesses, which are detailed below.

- *Arbitrary process and researcher bias*: Grouping and collapsing data into broader categories can be arbitrary and may lead to slightly different results depending on the researcher. Hence, the final categories were critically reflected upon to assess whether they were reasonable and comprehensively inclusive of key data.

- *Loss of richness*: Synthesizing, grouping and collapsing data may lead to loss of richness of information and contextual aspects of responses. In order to preserve the content, the final categories have been validated using the reverse process: the "identified challenges" are read in parallel to the original transcripts generated by open-coding in order to make sure that no important information is lost.

- *Misinterpretation*: Categorizing the items in terms of frequency, can lead to the belief that something mentioned more often is more important or has a stronger weight on the research question. Since this is not necessarily the case, results were not interpreted as more important when reported more frequently.

- *Assumption*: The results are based on the assumption that interviewees' responses were objective, non-biased, and not based on conjecture. However, these opinions, often subjective in nature might not represent actual responses for the research question addressed.

Moreover, Phase's 4 (in-depth interview) *opportunistic sampling technique* has its own limitations in terms of interviewee selection. Indeed, the method implies that only accessible relevant parties are to be interviewed. In the case of this study, 3 countries from North Africa (Algeria, Morocco, Egypt) were reached, and 1 from the Levant (Lebanon). Hence, the interpretation of findings may not specifically apply to the other countries (Sudan, UAE, Qatar, Jordan, and Tunisia). Nevertheless, the study results provide a summary of trends within the Arab region that can be used as a baseline for subsequent individual country or site-specific research in the Arab region.

4.8.2 Limitations of BREMi method and strategies to reduce them

The most important inherent weaknesses of PAME evaluation tools (Section 2.2.3.6) have been taken into consideration when developing the BREMi Framework. The following approaches were utilized to incorporate critiques to the extent possible (within available resources for the research):

(1) Respondents were requested to rate each indicator as "important" v.s "not important" while attributing a score to each. This provided a basic level of weighting indicators qualitatively, and assessing their relevance to the ArabMAB context.

(2) Indicators within each BHI have been adapted to the idiosyncrasies of BRs as compared to PAs, and to their specific functional objectives.

(3) Contextual relevance of each indicator was reviewed and validated by a local MAB expert with academic and field experience in the ArabMAB region.

(4) Correlations of individual indicators (BHIs) with mean BREMi scores were measured independently and in parallel to correlations of individual BHIs with outcomes. Moreover, each outcome's correlation with mean BREMi score was measured independently. Hence, decoupling of these parameters was well accounted for in data processing and analysis.

In addition, the BREMi tool presents the same limitations relating to subjectivity as other MEE tools, most notable of which is interviewee bias (Section 2.2.3.6). Indeed, self-evaluation is often conducted by only one person representing the PA management team or authorities, hence his/her level of honesty will have a major role in obtaining results that fairly represent reality (Burgman 2001; Stoll-Kleemann 2010; Cook and Hockings 2011; Papp 2011; WWF 2007). Moreover, *performance evaluation* is a sensitive subject to PA managers when interpreted as an evaluation of their personal performance, as highlighted in the findings from the *informal interviews* (Table 21, Challenge 11). Consequently, interviewee bias can manifest itself as a self-serving bias where interviewees try to "clear themselves" from responsibility over negative performance outcomes, and vice-versa (Miller and Ross 1975; Bradley 1978). Another manifestation of self-serving bias relates directly to interviewee's potential misinterpretation of aims and implications of the evaluation. Bradley (1978) identified "defensive" and "counter-defensive" mechanisms in attributions processes whereby fictitious beliefs on the outcomes of evaluation may lead to deflation or inflation of self-assessment scores. For example, respondents to BREMi evaluation may wrongly believe that the results will be shared with funding agencies that may channel more funds when the results are poor, which can lead to "deflating" the evaluation as a self-serving bias.

Strategies used to address these limitations include:

1. Maximizing the level of understanding of indicators and trying to minimize "misinterpretation of meanings" for all respondents by developing more elaborate indicators and stating them as full sentences rather than "thematic titles" (Table 19).

2. Encouraging the *survey protocol* to be filled by teams within BR management staff, which assumes that the discussion and consensus on final scores will minimize self-serving biases (Cook and Hockings 2011).

3. Including questions that check for consistency and capture potential "inflation/deflation" of scores in the survey protocol (Section 6.2.5).

4. Corroborating survey self-assessment results with results from the other methods used in this research, in order to consolidate the main findings (i.e. recurring themes in results using the different methods of the 4 Phases are considered the most solid findings). Triangulation of findings from the different methods helps limit biases originating from the tools' limitations, as well as researcher bias in analysing data.

5. Clarifying the aims of the survey (i.e. self-evaluation) and end-use of results to the interviewee in the introduction letter to the survey (Appendix 2.1) in order to minimize potential "misinterpretations" of the study objectives and consequent self-serving biases.

Finally, similarly to all PAME tools, the BREMi tool is just the first version of a BR evaluation tool that can potentially be improved as a standard tool and/or adapted to different uses and contexts, as more lessons are learned from its application (Anthony and Shestakova 2015).

4.8.3 Limitations of comparative analysis

Comparative analysis is used as part of Phases 2 and 4, with the Global Study (Leverington *et al.* 2010b) and GoBi project findings (Stoll-Kleemann 2007) respectively. Relative to the current research on Arab BRs, these studies present many differences in their design, response levels and characteristics, and other factors that could induce bias in the interpretation of comparison results. Hence they are only considered as good benchmarks but do not provide 100% comparable groups to this study's. Therefore, explanations for differences in results between ArabMAB study findings and global findings will not be directly sought within the scope of this research, rather differences will be considered as regional differentiators and reasons for these differences will be sought only in the local context of Arab BRs (Chapters 6 and 7).

CHAPTER 5: ARAB-MAB GLOBAL REPRESENTATION AND STATE OF CONCEPT IMPLEMENTATION

Chapter 5 builds on the results of both the informal interviews (Phase 1) and survey (Phase 2) to address research questions 1 and 2. While the first part of the Chapter focuses on addressing Q1, and the second Q2, the presented results and related analysis are often crosscutting.

> **Q1: For which reasons are the BRs of the Arab region under-represented in global datasets and published research on PA management?**

5.1 Informal interviews (Phase 1)

5.1.1 Assumptions

Since global studies and datasets on PAs/BRs were so far conducted/developed by institutions outside the Arab region, most informants for Phase 1 interviews were also from outside the region. Therefore, results largely represent the experience of "foreigners" researching BRs in the area. Moreover, the following assumptions should be considered when interpreting results:

- Contacted persons represent an institutional opinion.
- Responses given by interviewees for the whole or parts of the Arab region, apply to the selected group of countries that constitute the ArabMAB Network.
- The broad professional and research experience of interviewees is a good indicator of the credibility of their responses.
- Insights and opinions provided by interviewees are used as best available responses to research question 1.

5.1.2 General results

Research question 1 is mainly addressed by Phase's 1 results summarized in Table 21 where the identified challenges are the outcome of an elaborated process of transcribing, coding, and collapsing data from interview transcripts (Section 4.3.4).

Respondents to informal interviews sometimes gave generic answers for "paucity of information on BRs in global datasets", rather than specific ones to the Arab region. Though the presentation of results below is inclusive of issues at different scales, those that have most potential impact and/or relevance to the Arab region are emphasized.

Table 21: Identified challenges leading to paucity of Arab-MAB data in published studies and datasets

Challenge	Scale	Count
1. Access to data	Local	5
2. Conceptual gaps	Global	4
3. Local capacity gap	Local	3
4. Prioritization (locally or UNESCO-MAB)	Local-Global	3
5. Language and communication	Local-Global	3
6. Availability of data	Local	2
7. Institutional formal relations	Global	2
8. Implementation guidelines gap (UNESCO-MAB)	Global	1
9. Incentive and motivation gaps	Local	1
10. Legal implementation mechanism gap	Global	1
11. Sensitivities to the "performance rating" theme	Global	1
12. Institutional gaps in ArabMAB Network	Local	1

Notes: *Scale* indicates whether the challenge is specific to the region (local) or general (global)
Count refers to the number of times the challenge was mentioned

The following presentation of findings groups them into closely related categories for a deeper understanding of their interconnectedness.

5.1.3 Access to data, language and communication

The most frequently mentioned reason for paucity of information is *lack of access to data*. Access to data encompasses *language* obstacles and *communication* gaps at two levels: (1) between local BRs from the Arab region and international organizations such as the UNEP-WCMC, and (2) between two or more international institutions. The outcome of these communication and language obstacles is that existing data is unreported, hence considered non-existent. As a consequence, existing reports or data points are not included in global databases such as the WDPA or the Global Study's MEE reports database.

Moreover, *language* was mentioned as an independent reason for lack of global representation of Arab BRs, from two main perspectives. First, most studies on MEE are conducted in "foreign languages", i.e. primarily *English* and/or *French*, and this might be preventing access to information by creating communication gaps between locals and foreign researchers. Secondly, the lack of local capacity and/or interest to publish in the native language - *Arabic* - due to the fact that most scientists from the region also obtain their higher education degrees in foreign languages, suggests a *communication gap* even within the Arab region.

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5.1.4 Data availability, local capacity, and local prioritization

Another important issue mentioned by interviewees is lack of data availability. Data availability is closely related to other factors including the lack of local capacity to conduct sound research on PA/BR management and management effectiveness. This issue was mentioned in parallel to the lack of support mechanisms and capacity-building investments in the region. Local incentives are missing for such evaluation, hence BR managers have minimal motivation to invest time and effort in such work, especially when resources are scarce and the support system is missing. The lack of support mechanisms in turn, is tightly linked to the weaknesses of the ArabMAB Network's institutional body i.e. the ArabMAB Council (Section 5.1.5).

Moreover, respondents perceive evaluation of management effectiveness as a *low priority nationally/locally* and consequently is not allocated the appropriate resources, whether for capacity-building or for conducting research on management and evaluating its effectiveness. Another mentioned reason for data paucity is that many Arab BRs are relatively recent additions to the WNBR, and hence not enough time has elapsed to conduct and publish MEE studies.

5.1.5 Institutional gaps in the ArabMAB Network

As described by respondent(s), the gaps in ArabMAB Network's institutional body i.e. Arab Coordinating Council and its Bureau (Section 2.4.4.1) - constitute weaknesses to effectively publishing data about the BRs within the network. These include:

- *Lack of coordination between members of the network, weak institutional capacity and structures*: communication and follow-up on meeting agendas is often inefficient within the network, partially due to a weak institutional structure. This negatively influences the achievement of set individual and regional goals for ArabMAB.

- *Unapproved bylaws and unclear network membership criteria:* ArabMAB is a legal entity registered as an institution with its own voted bylaws. "Disagreement between the representatives of the [participating Arab] countries on adopting an appropriate and equitable bylaws" has been reported to be the main reason behind dysfunctional aspects of the ArabMAB institution (Ramadan-Jaradi pers. comm). Moreover, the relevance of criteria for the selection of membership in the Arab Coordinating Council and Bureau has also been reported as questionable. MAB National Chairs and Network membership roles are often attributed to academics with no background or interest in BRs/MAB program, leaving less "space for" qualified BR managers to take such roles. A similar issue has been reported for the selection of BR managers i.e. their selection is not always

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appropriately based on their background and interests, and consequently they do not effectively engage in the program where this situation applies.

In that perspective, the *"unapproved bylaws and unclear network membership criteria"* reduce ownership and engagement of Arab BRs stakeholders in the implementation and effectiveness of the program regionally.

- ▪ *Absence of motivation and incentives for members*: incentives are lacking for the fulfilment of local ArabMAB agendas especially when the efficiency and capacity are weak. Hence, there is a motivation gap that reduces potential outputs such as research and publications.

Overall these institutional gaps create inefficiencies within the ArabMAB Network, which can partially explain the absence of communication and published material from the network regarding the Arab BRs state and management.

5.1.6 Gaps in concept, legal implementation and implementation guidelines

The conceptual gap was reported as a global scale problem rather than a specific issue in the Arab region. It falls at the level of understanding the difference between a Protected Area as per IUCN's (2008) definition, and a BR as per UNESCO-MAB's most recent definition (Section 2.1.3). A lack of formal consensus at the international level about the BRs being a type of PA or a different type of conservation strategy was observed during interviews. The confusion between the two concepts is felt at the implementation level as well. In this regard, the *lack of implementation guidelines* and of *legal implementation mechanisms* for buffer and transition zones (specific to BRs vs. PAs), were mentioned as obstacles to effective integration of BR data in global PA datasets.

5.1.7 UNESCO-MAB prioritization and formal institutional relations

Some respondents mentioned that the representation of BRs in global PA studies and WDPA are not considered a priority by the UNESCO-MAB Secretariat that focuses on keeping their own databases on BRs separately. Indeed, it was mentioned that UNESCO-MAB doesn't attribute priority to the inclusion of the WNBR with accurate mapping data points into the global WDPA. This was later confirmed by UNESCO-MAB Secretariat as they are working on having their own digital database online, and started collecting shape-files of BRs from governments of their respective countries.

Another perspective mentioned is that UNESCO and IUCN, operating the different programs of MAB and PAs respectively, do not have a formal collaborative relationship. The absence of

formal institutional relations has legal and financial implications on data rights and ownership, and exchange of information. Hence, in the case of MAB, it is one of the main reasons why data is not proactively shared with other organizations that have PA related databases such as UNEP-WCMC (for WDPA) and IUCN (for PAs). The opposite is noted for the World Heritage Program operated by UNESCO, which entails a formal collaboration on natural and mixed World Heritage Sites (WHS) with IUCN, which is "officially recognized in the text of the Convention as an Advisory Body for all natural and mixed natural-cultural sites" (Dudley 2013, 70).

The above Section has presented the main results of the informal interviews (Phase 1), which identified the main challenges to effective BR reporting and representation in global datasets. As highlighted in Table 21, some of the reported obstacles can be considered global issues also applicable to the Arab region, while others are more specific to the region. The following Section focuses on the survey (Phase 2) results, which bring additional input to Q1 and largely address Q2.

5.2 Survey results (Phase 2)

The adaptive design of Phase 2 allowed for testing some results obtained in Phase 1, which is particularly important in this research given that many assumptions (Section 5.1.1) could have influenced Phase 1 results. Some of the Phase 1 factors reviewed directly or indirectly in Phase 2 include: language and communication, data access and availability, and conceptual understanding and implementation.

5.2.1 Response rate and interpretation

Results are quite representative of the ArabMAB region due to a high response rate in total and within countries. Indeed, 7 of 9 countries participating in the survey had a 100% response rate within country (Algeria, Egypt, Jordan, Lebanon, Tunisia, UAE and Yemen), while Sudan and Morocco had a 50% response rate (i.e. 50% of BRs in the country responded).

5.2.1.1 Influence of personal relations on response rate

One of the most influential factors of high response rate is the presence of established trustful professional relations between the persons collecting the data and the approached BR authorities. The IUCN North Africa program Coordinator who distributed the survey protocol to the North African BR representatives, has long-term working relations with these authorities. Hence, his continuous follow-up within the framework of their existing relationships, largely

explains the 100% response rates from Algeria, Tunisia, and Egypt. He explains the non-response from "Arganeraie" BR as a consequence of its recent appointment under the Ministry of Agriculture for its endemic species of the Argan grove (*Argania spinosa L.*). In contrast, other BRs are under the MOE that manages all other PAs in Morocco, and with which he has direct contacts. Being from Lebanon, the researcher had direct contacts with the Lebanese and Jordanian BRs, which also had a 100% response rate. On the other hand, Yemen and Sudan were approached for the first time.

5.2.1.2 Influence of language on response rate

By proposing to local BR managers to complete the survey in one of the 3 local languages of their choice (*French*, *English* or *Arabic*) the researcher aimed at identifying language preferences in the region (Table 22). This allowed analysing indirectly the potential role of language on data availability.

Table 22: Language distribution per country and respondent (N=22)

Response language	Country	Number of respondents
English	Egypt	2
	Jordan	2
	Lebanon	3
	United Arab Emirates	1
French	Algeria	6
	Morocco	1
	Tunisia	4
Arabic	Sudan	1
	Yemen	2

The distribution shows that respondents within countries have the same language preference regardless of the chosen language, for example all six respondents in Algeria selected *French*. Interestingly, respondents from Sudan and Yemen preferred using their native *Arabic* language for their formal response. Moreover, the geographical distribution of "response language" confirms a preference for *English* in the Gulf, Levant and Egypt, and *French* in Maghreb countries (Algeria, Morocco, Tunisia), which is likely the heritage of the colonization history as mentioned earlier (Section 4.4.2.2). The finding that each of the three languages has been selected at least once as "language of choice" indicates that language plays a role in access to data and possibily data availability in the Arab region.

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5.2.2 International interest for research in the Arab region

In the aim of better answering the question of paucity of published research about the ArabMAB, respondents were asked whether they were ever approached for a regional and/or international research about BRs (Appendix 2.2). More than half (14 of 22) responded negatively, while 4 said "yes" and 4 "I don't know". This result could reflect a lack of inclusion of the region in global BR studies, though the result is not conclusive due to many potential biases as the answer largely relies on respondents' memory, and respondents are not controlled for changing roles over time.

Both informal interviews with international and local stakeholders, as well as survey results have shed the light on factors that are most likely to be direct or indirect reasons for paucity of published data about the Arab BRs. The following Section of this Chapter focuses on addressing the second research question related to the perception and implementation of the BR concept in the Arab region.

Q2: How is the BR concept perceived and implemented in the ArabMAB?

5.3 Biosphere reserve concept implementation in the Arab region

Understanding the BR concept and constituencies is one essential prerequisite to its effective implementation locally by key stakeholders – including managers. In this research, the understanding of the BR at the ArabMAB level has been assessed in 2 ways:

- Assessing the local perception and implementation of the multi-functional zonation scheme by measuring respondents' priority ranking of BR functions and comparing it to actual implementation (Section 5.3.1).
- Conducting a baseline assessment of BR concept implementation and management approach, which aims to assess the gap between BR concept (based on its most recent definition, and constituencies), and current implementation in the Arab region (Section 5.3.2).

5.3.1 Perception and implementation of biosphere reserves functions

One of the questions addressed by the survey is "How do Arab BR managers/representatives perceive the functional priorities of BRs?" As noted in Chapter 2 (Section 2.3.3), UNESCO-MAB defines 3 functions for a BR:

1. conservation of values (including natural and/or cultural);
2. (sustainable) development; and

3. logistic support (education, research and monitoring).

This definition is the outcome of the chronological evolution of the concept since its inception, as multi-functionality has not always been clearly defined into the above 3 categories. Hence, in order to better capture current BR multi-functionality perceptions in the Arab region, these 3 functions have been sub-divided into 5 categories that would cover all their aspects as shown in Table 23.

Table 23: BR functions classification used in the research compared to UNESCO-MAB definition

BR functions defined by UNESCO-MAB	BR functions classification in this research
1- Conservation of values	1- Conservation of natural values
	2- Preservation of cultural values
2- Sustainable development	3- Sustainable development
3- Logistics	4- Environmental education
	5- Environmental research and monitoring

Using the 5-category classification, Figure 10 presents the results of <u>local perceptions</u>. In order to facilitate interpretation, Figure 10 shows the average rating received by each function. The "mean ranking score" is the average priority given by respondents on a Likert scale of 1 to 5 where 1 is the lowest priority and 5 is the highest.
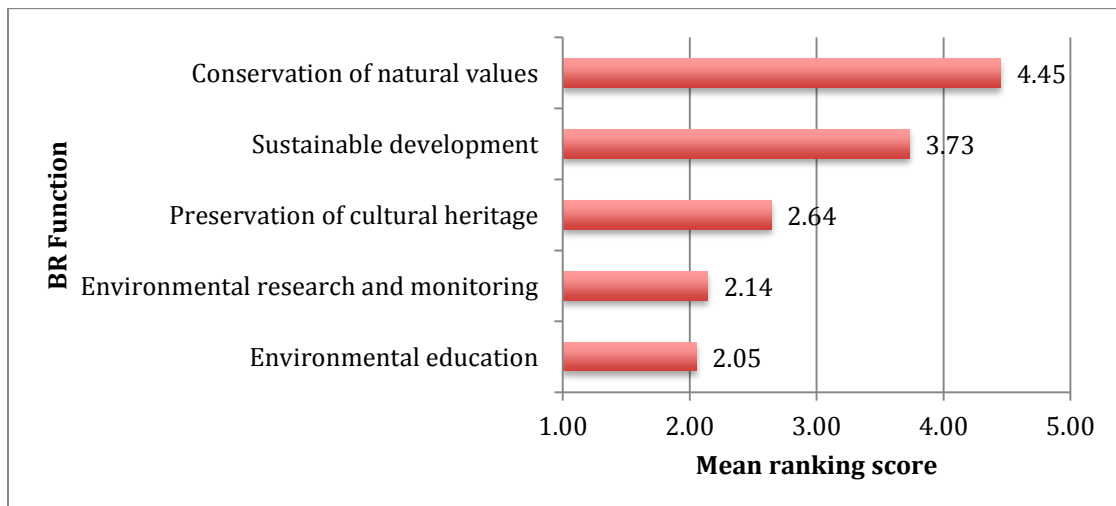
Fig. 10: Average priority rating for BR functions perceived importance by respondents (N=22)
Note: ratings were mutually exclusive (i.e. respondent couldn't give the same rating to 2 functions)

On the other hand, a similar assessment of <u>actual implementation</u> of the 5 functions resulted in the following order of priority (Fig. 11): (1) conservation of natural values, (2) sustainable development, (3) environmental research and monitoring, (4) environmental education, and (5)

preservation of cultural heritage. Mean ranking scores were measured on a Likert scale from 1 to 5 where 1 represents the "least applied" and 5 represents the "most applied" BR function (Fig. 11).
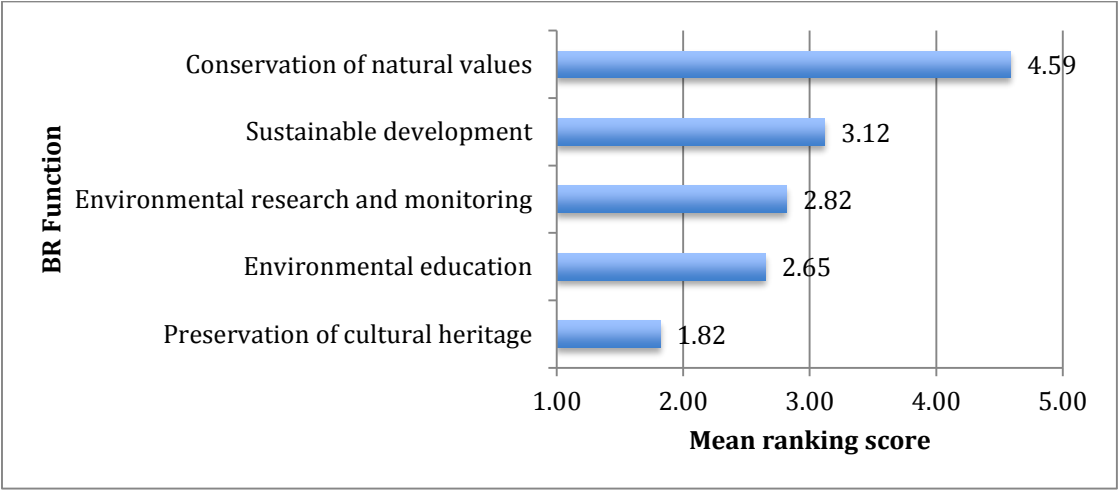
Fig. 11: Average priority rating for the actual implementation of the different BR functions as perceived by respondents (N=17)[18]
Note: ratings were mutually exclusive (i.e. respondent couldn't give the same rating to 2 functions)

When compared[19], the mean rank scores for the application of BR functions in the ArabMAB were not significantly different from the perception's mean ranks, except for *environmental research and monitoring*. Indeed *environmental research and monitoring* had a significantly higher ranking at the level of implementation priorities ($\bar{X}$=2.82, ranked 3) compared to its perceived priority rank ($\bar{X}$=2.14, ranked 4) (t=2.50, p<0.05, N=17). In other words, there is a significantly higher level of environmental research and monitoring activities implemented in the Arab BRs than perceived as priority by the same BRs' managers.

Moreover, though the recent definition of a BR emphasizes the sustainable development objective i.e "learning sites for sustainable development" (UNESCO 2014a), the understanding/perception and implementation of BRs in the Arab region remains focused mainly on *conservation of natural values*.

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[18] Only 17 of 22 respondents answered the question assessing <u>actual implementation</u> because 5 BRs stated having no operational management in place in filter question 10 (Table 17), and were hence excluded from answering the questions of the *survey protocol* that followed.
[19] This comparison was conducted pairwise for the 17 BRs that responded to both questions 5 (perception ranking) and 11 (actual implementation ranking) of the survey protocol (Table 17).

5.3.2 Concept implementation and management approach

5.3.2.1 Results of the rapid baseline assessment

The results of the "baseline assessment of BR concept implementation and management approach" for Arab BRs (Section 4.4.2.5) are presented in Figure 12.
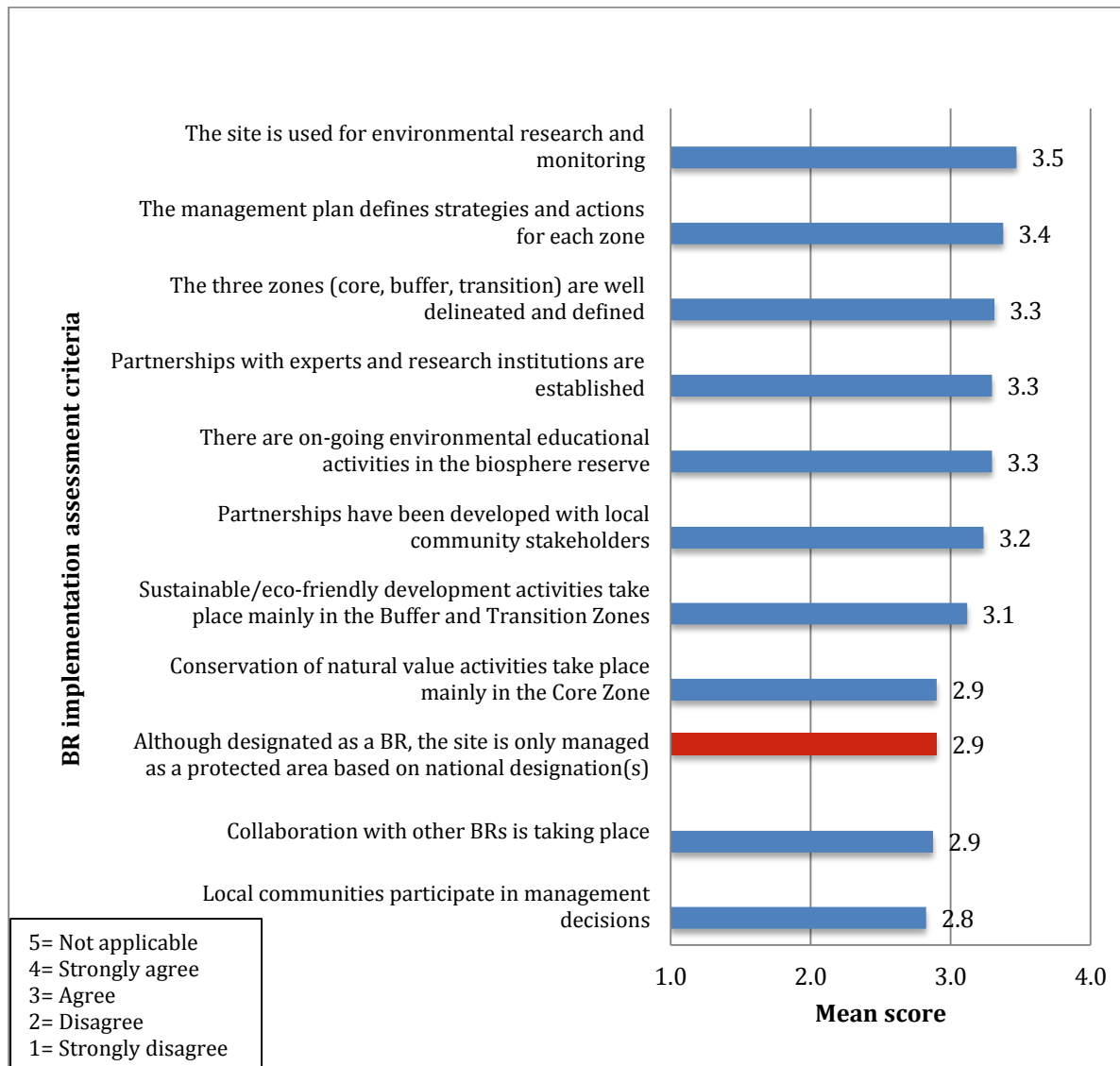
Fig. 12: Results of baseline assessment of BR concept implementation and management approach in Arab BR(s) (N=17)
Notes: Blue= positive score indicates positive implementation; red= positive score indicates negative implementation; mean scores were calculated excluding score 5

All criteria scored in the narrow range of 2.8-3.3 showing that respondents tended to "agree" or "strongly agree" with all statements. The following Section presents a summary of obtained results analysed using the framework of the four aspects of a BR defined in Section 4.4.2.5.

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5.3.2.2 Differentiation from a protected area

Results generally indicate an appropriate definition and delineation of zones (3.3), an important structural differentiator from a simple PA in which zonation is not a <u>defining</u> characteristic. In terms of management planning, zone-specific management planning scored positively as well (3.4), indicating the presence of appropriate management plans for BRs from the zoning aspect. In contrast, actual differentiation at the implementation level measured by the only "negative criterion" *although designated as a BR, the site is only managed as a protected area based on national designation(s),* scored 2.9 (between "disagree" and "agree"). This finding suggests that some BRs are still being managed as PA sites based on national designations without fulfilling the additional requirements brought by the international BR designation. Accordingly, the BR designation would be considered of no added value to these PAs making them "paper BRs".

5.3.2.3 Functional zonation

The logistics function of the BRs in the Arab region - comprised of education, research and monitoring - is well implemented since its related criteria scored within the "agreeing" range (between 3 and 4), with *the site is used for environmental research and monitoring* scoring highest of all criteria (3.5). This finding is consistent with the previous finding showing a significantly higher level of implementation of *environmental research and monitoring* activities than is perceived as priority by Arab BR managers (Section 5.3.1). In parallel, the sustainable development function has been reported as taking place mainly in the buffer and transition zones with a mean score of 3.1, which is in line with the BR functional zonation scheme definition. However, the mean score does not show a tendency towards "strong agreement", which could reflect a noticeable presence of *sustainable development activities*[20] in the core areas as well. On the other hand, the conservation function seems to be not solely focused in the core areas of BRs in the Arab countries, as the mean score of "Conservation of natural value activities take place <u>mainly</u> in the core zone" was below "agreeing" (2.9). "Conservation of natural values" scored highest in both perception (Fig. 10) and implementation (Fig. 11), which suggests that it is the main priority of BRs in the region, however Figure 12 shows that it is taking place throughout all functional zones.

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[20] Does not refer to a specific class of activities, rather to a type of development that is not unsustainable.

5.3.2.4 Partnerships, collaboration and participatory management[21]

Respondents mostly agreed on the presence of partnerships with local community stakeholders (3.2), as well as research centers (3.3). However, there was a lack of BR collaboration with each other (2.9). Moreover, *partnerships with local community stakeholders* did not necessarily translate into actual *participation of local community in decision-making* as the latter scored lower (2.8), and is the lowest scoring criterion overall in this assessment. Hence, there is a large opportunity for improving the ArabMAB Network's implementation in terms of collaborations with other BRs and community participation in BR-related decisions.

5.4 Summary and discussion

5.4.1 Factors influencing paucity of data about Arab-MAB, and potential implications

The paucity of published data on ArabMAB can be attributed to many factors, of which the most relevant to this research include: (1) Access to information and communication barriers; (2) conceptual and implementation gaps; (3) lack of capacity; and (4) institutional gaps at the ArabMAB Network level.

5.4.1.1 Access to information

Access to information from the region is one of the major difficulties faced by foreign researchers for publishing on Arab BRs. Key informants and language are key aspects that influence this problem. Based on the current study design, these challenges can be overcome by the selection of (1) researchers (or partners collecting data) from the region who have established trustful working relationships with surveyed subjects, and (2) preferred languages in the region for communication, which include all 3 spoken languages: *English*, *French*, and *Arabic*.

5.4.1.2 Conceptual and implementation gaps

Conceptual and implementation gaps have been reported as a global issue and refer to the lack of understanding of the main differences between a PA and a BR. The issue has shown to be prevalent in the ArabMAB Network since the *baseline assessment of BR concept implementation and management approach* showed that many BRs agree that they are managed solely as PAs, which reflects super-imposing both concepts at the implementation level as well.

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[21] Aspects (2) and (3) in Section 4.4.2.5 have been joined in the Section for analysis.

This conceptual confusion was highlighted as early as 1996, by Bridgewater and colleagues (1996) in their manual focusing on clarifying the differences between PAs and BRs. Their main message was that the 2 models are not contradictory, nor mutually exclusive; rather PA categorization can enhance the implementation of BRs. The authors explain that IUCN categories are based on management objectives; hence BRs cannot fit into only one category since their basic premise is inclusive of multi-management purposes within the functional zonation scheme. Hence the different zones may be aligned with different PA categories depending on their management objectives. They argue that the IUCN categorization system provides a good framework to develop BR management plans that recognize the zones as PAs with different management objectives (Bridgewater *et al.* 1996).

Despite these "early" clarifications, the research shows that this confusion still exists today and is reflected in the Arab region. Addressing this gap more explicitly is necessary to the academic and local community as it will clarify the potential overlap of PA and BR datasets, and improve differentiation of the BR concept at the implementation level.

5.4.1.3 Local capacity, priorities and institutionalization

Local capacity gap refers to the lack of local capacity and motivation to conduct and publish research about BR management. Shortage of technical assistance and capacity-building for management staff were identified as some of the main global issues of PA management during the COP8 meeting of the CBD (UNEP 2006; SCBD 2009) (Section 2.2.1). Hence, the problem is widespread, however local factors also influence building capacity and can consequently be targeted to overcome this obstacle. These factors include: local priorities, and institutional support. Building capacity locally for improving the BR management and research activities requires directing funds and allocating resources to this aim. In that perspective, the level of priority of the MAB program and conservation at large in the country, as well as its degree of institutionalization locally can largely determine its sustainability.

In order to better integrate the MAB program into local priorities, it is important to integrate it into local agendas in the broader national conservation framework. The complexity of BR governance as detailed by Shielp and Stoll-Kleemann (2010) makes BR success largely influenced by national legislative and strategic frameworks as well as local support (Section 2.3.4.3). In this perspective, integration and alignment of the MAB program with other conservation and sustainability programs is critical for its effective implementation and

management. Since MAB related activities are often within the jurisdiction of several governance bodies including the ministries of environment, agriculture, water and energy etc., the integration of MAB will require mainstreaming of its components into main sector programs, with accompanying structural arrangements for successful collaborative management.

Another approach to integrate MAB is through incorporating it in the national legislative framework; other approaches include integration at a strategic level through recognizing the role of the program, monitoring and reporting its impact on the compliance with MLAs (Table 10). In this perspective, the role and responsibilities of each governance institution must be clearly defined and integrated in order to optimize implementation efficiency and avoid counterproductive roles or programs (Stoll-Kleemann 2007). Moreover, in the presence of political turmoil, which has been escalating in the Arab region[22] for the past 5 years, local priorities can become volatile and shift quickly (Sections 2.4.2.3, 2.4.2.4). In times of armed conflict, government resources are channeled towards security, while administrative and legislative functions for natural resource management shift to a relatively much lower level of priority (Matar 2009; Matar and Anthony 2010). For example, this was the case of the Shouf BR (in Lebanon) that saw its yearly funding by the Ministry of Environment (MOE) postponed for years during and shortly after the 2006 war on Lebanon (Matar 2009). In a conflicted area, it can take years to restore the "no-conflict situation" and return to "business as usual" for conservation programs. This vulnerability in the Arab region reinforces the importance of national integration of the MAB program in order to increase its resilience in times of political turmoil.

5.4.1.4 ArabMAB institutional gaps

Moreover, institutional gaps at the level of the ArabMAB Network can lead to a lack of institutional support to BRs from this particular network. As explained in Chapter 2 (Section 2.3.2), regional MAB networks have the role of fostering knowledge and capacity exchange through regional collaboration. The reported weak structure and cooperation between ArabMAB members can hence hinder its capacity to effectively fulfil its support function. In order to improve its support function to national BRs, the ArabMAB institution will need to review its bylaws and update its criteria of nomination of members to include people with more appropriate levels of interest, motivation and expertise in the subject, and align the members'

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[22] Does not apply to the Gulf States of the ArabMAB Network: UAE, Qatar (non-respondent)

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qualifications with the specific needs of the BRs locally. Strengthening the network will also potentially require the development of a regional program of work, aligned with the international MAB strategic direction. If developed using a participatory approach with all ArabMAB BR representatives, this common agenda can create a shared vision and program of work that would increase the sense of ownership and create stronger ties between members. Finally, the ArabMAB governing institution will have to create a more effective communication program to enhance information/knowledge exchange and cooperation between BR members of the network.

5.4.2 Perception gap in the Arab region

The local perception of BR multifunctional priorities is generally consistent with its implementation in the ArabMAB Network where the 2 main priorities are *conservation of biodiversity* and *sustainable development* respectively. This finding is also aligned with the broad aim of BRs described as "promoting solutions to reconcile the conservation of biodiversity with its sustainable use" (UNESCO 2011) (Section 2.1.3). These 2 functions remain largely intertwined priorities of the UNESCO-MAB program throughout the chronological evolution of the BR concept (Section 2.3.3). However, recent emphasis in the definition of the BR is on *sustainable development* where management of biodiversity is only one integrated aspect. The finding that Arab BRs remain focused on the *conservation of natural values* is consistent with the fact that many are "still managed as PAs".

Hence there is a need for transitioning the conceptual understanding of the BRs in ArabMAB to sites of sustainable development learning and model sites, where conservation is one - but not the only - important aspect of their functions. This goes in parallel with the conceptual gap that leads to super-imposing the BRs to PAs since PAs have their own management objectives and are rather conservation-focused. Hence providing a better baseline understanding of the BR concept and requirements at the nomination level through better communication and capacity-building of authorities is important to avoid this problem and potential consequences of non-differentiation at the implementation level. Cost-effective approaches to achieving this include: (1) Leveraging existing infrastructure and channels including the regional UNESCO office in Cairo, ArabMAB Network meetings, related conservation and sustainability fora, and (2) twinning of Arab BRs with model sites in other MAB networks that have achieved the appropriate level of understanding and implementation, and learning from their experiences.

5.4.3 Potential strengths and weaknesses of concept implementation

The brief baseline assessment of Arab BRs concept implementation and management approach allows for a preliminary identification of their relative management strengths and weaknesses. Potential weaknesses include: (1) Lack of collaboration with other BRs: this result is consistent with reported ArabMAB Network gaps, (2) lack of participation of local communities in decision-making. On the other hand, potential strengths identified include: (1) Environmental research and monitoring; (2) appropriate management planning. Additional results obtained at a later stage of the research will provide further evidence that could consolidate the conclusions of this Chapter drawn from the preliminary assessments.

In the next Chapter, results from the survey are presented and discussed in the frame of the global PA/BR management effectiveness literature.

CHAPTER 6: MANAGEMENT AND EVALUATION TRENDS FOR ARAB-MAB

Chapter 6 is structured around addressing research question 3 through three different steps: (1) Characterizing the Arab BRs' local governance, (2) presenting MEE results for 17 BRs based on the survey, and (3) analysing the PR process and report contents[23]. A short interpretation of results is integrated into the different Sections of the Chapter, while a deeper analysis will be provided in later Chapters in light of further findings.

6.1 Local governance of Arab biosphere reserves

6.1.1 Governance types and characteristics

Managing institutions are at the core of the study as they constitute the "object" of evaluation and are the first level of organizations behind the success or failure of BR management. Hence, before addressing the question of management effectiveness, the governance types, institutional characteristics, and their communication effectiveness within the MAB network were identified in order to provide an understanding of the ArabMAB local governance structure and allow for a better analysis of BR management effectiveness.

As summarized in Table 24, results show that government institutions govern the vast majority of Arab BRs (68%), which responded to the survey. Of the remaining 32%, four BRs are managed by NGOs, two are co-managed by local and government institutions, and one is not yet managed (Oasis du Sud Marocain, Morocco). None of the BRs are managed by private institutions, nor by local communities.

Table 24: Distribution of governance types within the Arab-MAB Network (N=22)

Governance type	n	%
Government institution	15	68
NGO	4	18
Co-management	2	9
No management	1	5

Governance types showed clear patterns sub-regionally. North African and Gulf countries (UAE) showed a government-centered management model, while countries of the Levant

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[23] Refer to Section 4.4.3.4 for details on statistical tests used for the results presented using SPSS in this Chapter.

(Jordan and Lebanon) have mainly NGO-based management systems. Exceptions included Shouf and Socotra BRs in Lebanon and Yemen respectively, both co-managed (Table 25).

Table 25: Local governance characteristics of Arab BR(s)

BR	Country	Governance type	Designation date	Start date of management	Staff no.*
Réserve de Biosphère du Parc National de Taza	Algeria	Government	2004	2006	53
Parc National du Gouraya	Algeria	Government	2004	2004	52
Parc National d' El Kala	Algeria	Government	1990	1983	76
Parc Culturel du Tassili n'Ajjer	Algeria	Government	1986	N.O.	-
Chrea	Algeria	Government	2002	N.O.	-
Parc National du Djurdjura	Algeria	Government	1997	1997	200
Omayed BR	Egypt	Government	1981	1986	11
Wadi Allaqi BR	Egypt	Government	1993	N.O.	-
Dana BR	Jordan	NGO	1998	1998	320
Almujib BR	Jordan	NGO	2011	1985	320
Jabal Al Rihane	Lebanon	NGO	2007	N.O.	-
Jabal Moussa BR	Lebanon	NGO	2009	2009	10
Shouf BR	Lebanon	Co-managed	2005	2005	20
Dinder National Parc	Sudan	Government	1979	1979	340
Parc National de l'Ichkeul	Tunisia	Government	1977	1977	350
Parc National de Bouhedma	Tunisia	Government	1977	1977	365
Parc National de Chaâmbi	Tunisia	Government	1977	1977	346
Parc National de Zembra et Zembretta	Tunisia	Government	1977	1977	90
Marawah Marine BR	UAE	Government	2007	2007	6
Bura'a	Yemen	Government	2011	2006	12
Socotra Archipelago	Yemen	Co-managed	2003	2003	96
Oasis du Sud Marocain	Morocco	None	1998	N.A.	N.A.

N.O.=No operational management in place
N.A.= Not applicable
*Staff numbers' wide range may be due to differences in respondents' inclusion/exclusion of attached staff such as park rangers, field workers, part-time staff etc. Since the criteria for inclusion were not clearly specified in the *survey protocol*, the numbers are not systematically comparable.

Other institutional characteristics of BR management were reported including: "start date of management" (by primary managing institution) and "staff numbers". Start date (year) of effective management reported by respondents varied between 1977 and 2007 while designation dates range from 1977 to 2011 (Table 25). Three BRs i.e. El-Kala, Almujib and Bura'a reported operational start date of management earlier than years of designation,

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potentially referring to the management of the BRs as PAs under earlier designations than UNESCO's.

Paid staff numbers of primary managing institutions ranged between 6 for Marawah BR in the UAE and 365 in Bouhedma BR, Tunisia (Table 25). The largest numbers of staff (≥ 300) were most typical of government organizations (mainly Ministries) managing Tunisian BRs, the Sudanese BR Dinder, in addition to the large Jordanian NGO i.e *Royal Society for the Conservation of Nature* managing Dana and Mujib BRs. In this context, it is relevant to note that this Jordanian NGO receives both patronal and practical support from the governing royal family (RSCN 2014). Finally, though only one BR reported the total absence of a managing institution i.e "Oasis du Sud Marocain" in Morocco, an additional 4 BRs reported the absence of operational management despite the presence of a formal managing institution.

6.1.2 Communication effectiveness across governance levels

After assessing the characteristics of local managing institutions, an evaluation of a "second layer" of governance was carried out through qualitatively assessing the perceived effectiveness of communication between local management and UNESCO-MAB institutional structures (Section 2.3.4). When survey respondents were asked to rate their communication with national UNESCO-MAB Committees, the following results were obtained (Fig. 13).
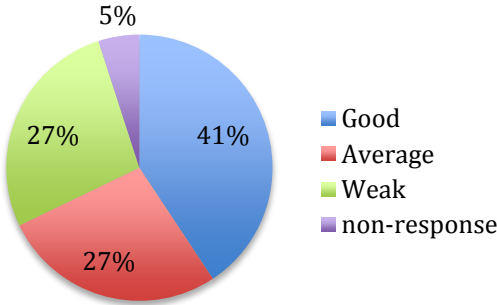
Fig. 13: Rating of communication quality by respondents with national MAB Committees

In terms of communication at the regional and international levels, only respondents from Tunisia, Algeria, Yemen and Sudan described their cooperation with the MAB governance institutions. Tunisian BRs typically stated an "average" level of cooperation with various regional and international MAB institutions. Algerian BRs consistently reported a weak to non-existent exchange with the ArabMAB national committees and/or international representation, stating that regional exchanges are limited to formal meetings and administrative reports. Exchanges were mostly intended at reporting compliance with MAB constituencies and

improving local capacity. *"The philosophy of the BR concept and the Seville Strategy still require legislative changes and improvements of capacity for gradual implementation in the case of all Algerian BRs"* stated one respondent from Algeria, referring to the scope of formal exchanges made with the MAB institutions. In Yemen[24], the relationship was described as weak for Bura'a (2011) and non-existent for Socotra Archipelago (2003).

6.1.3 Summary and conclusion

In summary, approximately 2/3 of the Arab BRs are governed fully or partially by government (ministries or committees appointed by ministries). In terms of communication with MAB governance institutions, over half (54%) of respondents perceive their relationship with the National Committees to be *weak* or *average*, whilst 41% rated it as *good*. Since national MAB committees have an important role in (1) setting local priorities and supporting the implementation of the BR locally, and (2) liaising with regional and international MAB programs (Section 2.3.4.2), a communication gap at this level can be an obstacle to effective implementation and management of Arab BRs. In general, most respondents expressed an interest and desire for improving the level and effectiveness of their relations with the different governance levels of the BRs. Hence, there is an identified opportunity to improve communication and relationships of local managers with national, regional and international MAB networks, with potential positive impact on BR concept implementation. This conclusion is congruent with the identified gaps within the ArabMAB Network and lack of cooperation discussed in Chapter 5.

The preliminary assessment of the BR concept perception and implementation, coupled with the characterization of governance locally provide a solid background for a better understanding and interpretation of the comprehensive MEE results for the Arab BRs presented below.

> **Q3 a) How are the Arab BRs performing in terms of management effectiveness?**
>
> **b) How do they compare to each other, and to other regional and global results?**

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[24] Notes: Yemen has been suffering from civil unrest for more than a decade, which has recently escalated into a coup and larger conflict. Though this dissertation is not looking directly at the impact of war on the cooperation of local BRs with MAB international institutions, these contextual factors and their timing in relation to BR designations are important to keep in mind for a better understanding of the study results.

6.2 Biosphere reserve management effectiveness in the Arab region

In this Section, management trends are identified for Arab BRs based on the survey findings. These trends are presented and briefly analysed below using the Global Study's structural framework and results as a benchmark for comparison (Leverington *et al.* 2010a, 30-45).

6.2.1 ArabMAB BREMi evaluation results

Arab BR management on average reaches a "basic" standard, comparable to the global PA standard (Leverington *et al.* 2010a, 2010b). Overall BREMi scores across the 17 BRs assessed[25] in the Arab region ranged from 4.43 ("basic with major deficiencies") to 8.65 ("sound"). The mean BREMi score is 6.31±1.040 (Fig. 14), falling on the high end of the "basic management" category (score 5.01-6.66) on a scale of 0 to 10 (Section 4.4.2.5)[26].
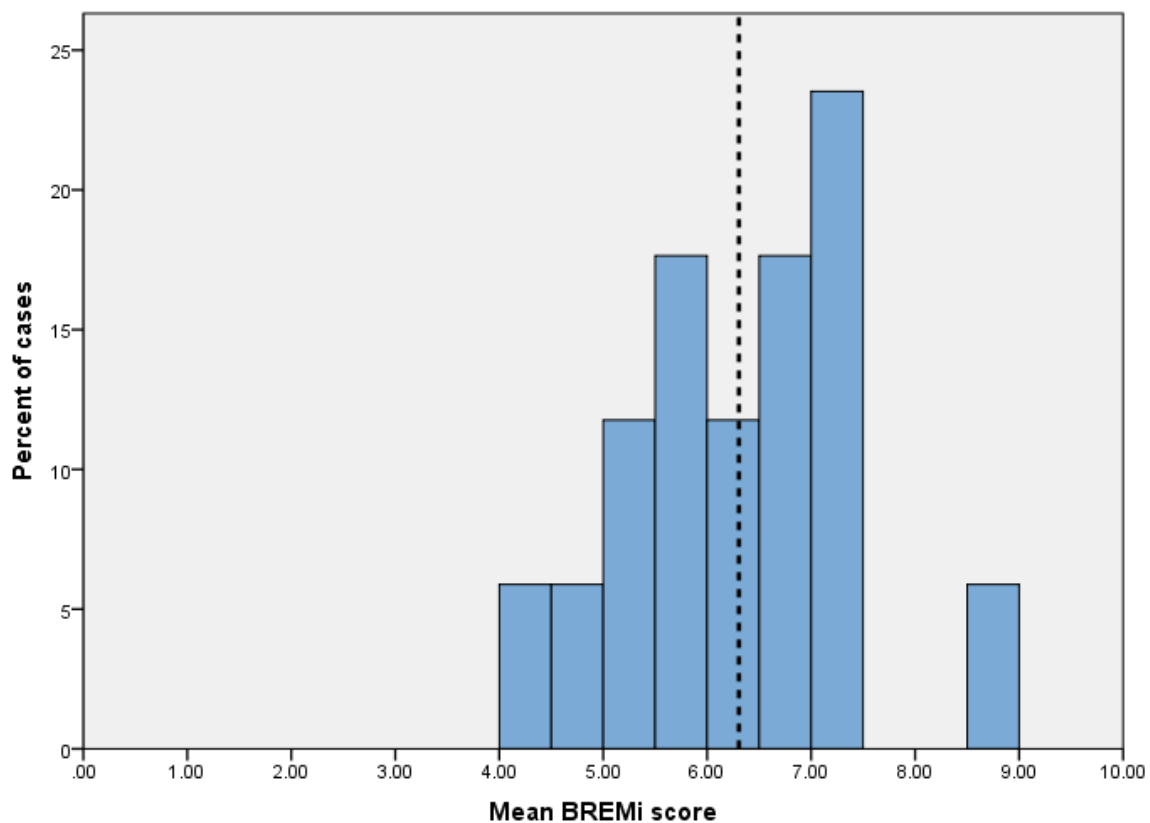
Fig. 14: Distribution of mean BREMi scores for BR assessments in Algeria, Egypt, Jordan, Lebanon, Sudan, Tunisia, UAE, and Yemen (N=17)
Mean score BREMi score (6.31) across all assessments is shown as a dashed vertical line

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[25] Only 17 of 22 BRs conducted the BREMi assessment since 5 BRs stated that they have no operational management in place (Table 17, *filter question* 10).
[26] Notes on methods:
  - Equal weights were assumed for each BHI (34) regardless of the number of indicators that each headline contained
  - The overall ArabMAB Network's mean was calculated as the sum of Arab BR BREMi scores divided by the number of BRs conducting the assessment (N=17)

In total, of the 17 BREMi assessments, 35% of BRs scored in the "sound" range, 53% in "basic", 12% in "basic with major deficiencies" and 0% in "clearly inadequate". In comparison, cross analysis of the 3184 assessments in the Global Study showed much higher proportions of PAs in the "clearly inadequate" and "basic with major deficiencies" ranges (Leverington *et al.* 2010b) (Fig. 15).
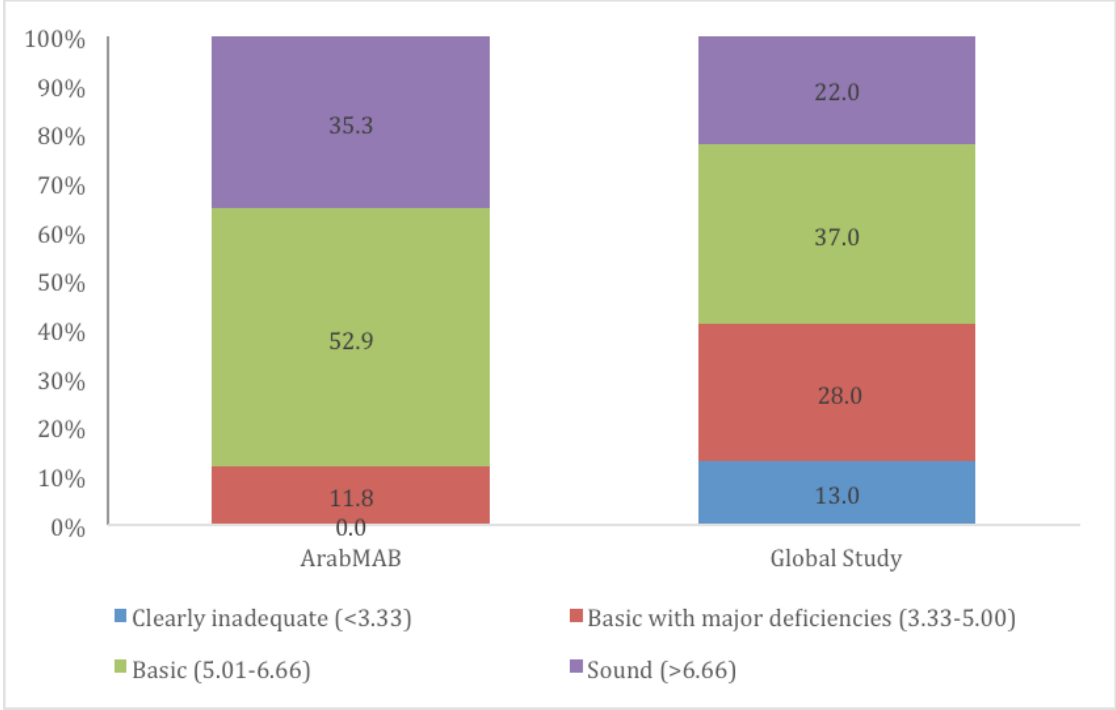
Fig. 15: Distribution of MEE results for Arab-MAB and Global Study PA(s) within standard categories
Global Study data source: Leverington *et al.* 2010b

6.2.2 Trends within countries

BRs did not consistently score in the same range within countries. Only 3 of the 8 assessed countries had all their national BRs scoring in the same management range, notably Jordanian BRs both scored in the "sound" range, while Yemeni BRs scored on the lower range, and Tunisian BRs consistently scored in the "basic" range. The remaining countries *either* had only 1 BR participating, which makes it difficult to observe whether their management effectiveness standard is BR-specific or country-specific, *or* showed variability of BR effectiveness results.

6.2.3 Trends across geographic and socio-economic contexts

Differences across geographic or economic contexts are difficult to infer due to the small number of cases, however some interesting findings are presented below.

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Despite the wide range of BREMi scores across countries (Fig. 16), the differences between them were not statistically significant (p=0.168)[27].
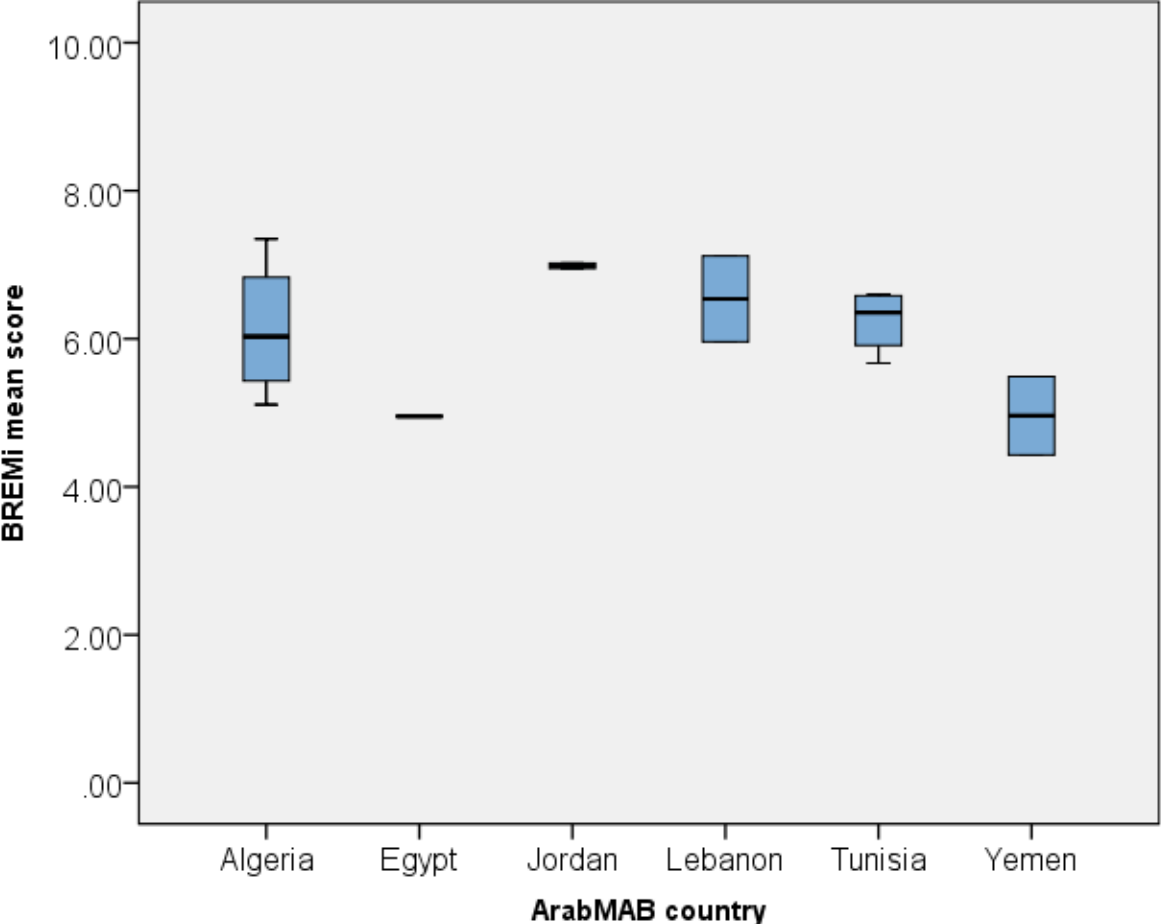
Fig. 16: BREMi score per Arab-MAB country
Note: The 2 countries where n=1 have been omitted from the figure to respect anonymity and confidentiality

Moreover, BREMi scores of BRs and mean BREMi scores of countries were not significantly different among the four HDI categories (Table 8) (p=0.286, and p=0.054 respectively)[28]. Furthermore, BREMi scores showed a medium non-significant correlation with the country HDI values (Spearman's r=0.389, p=0.123). These results show that the level of Human Development of the country is not strongly associated with BR management performance in the ArabMAB region. In contrast, the Global Study analysis of PAME evaluation mean scores

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[27] BREMi scores were not normally distributed, hence the non-parametric (Kruskal-Wallis) test was used (Section 4.4.3.4).
[28] Data was not normally distributed; hence the non-parametric (Kruskal-Wallis) test was used in the case of both reported p-values (Section 4.4.3.4).

showed "highly significant differences […] the scores are much higher in those countries with high and medium HDI ratings" (Leverington *et al.* 2010a, 31).

6.2.4 Comparisons with regional and global results

When compared sub-regionally, West Asia (i.e. Jordan, Lebanon, UAE, Yemen) and North Africa (Algeria, Egypt, Sudan, Tunisia) had very similar BREMi results of 6.30± 1.046 and 6.31± 1.093 respectively, with no significant difference (p=0.985). When compared with other regional MEE study results using the CRF, the ArabMAB mean score (i.e overall BREMi score) was lower than the Levant (Jordan, Lebanon, Syria) mean score of 7.01±1.54 for the 18 PAs reported by Anthony and Matar (2012) (Fig. 17)[29], but greater than the global MEE mean of 5.30±1.7 (adjusted based on scale difference) on the global dataset of 3184 assessments (Leverington *et al.* 2010b).
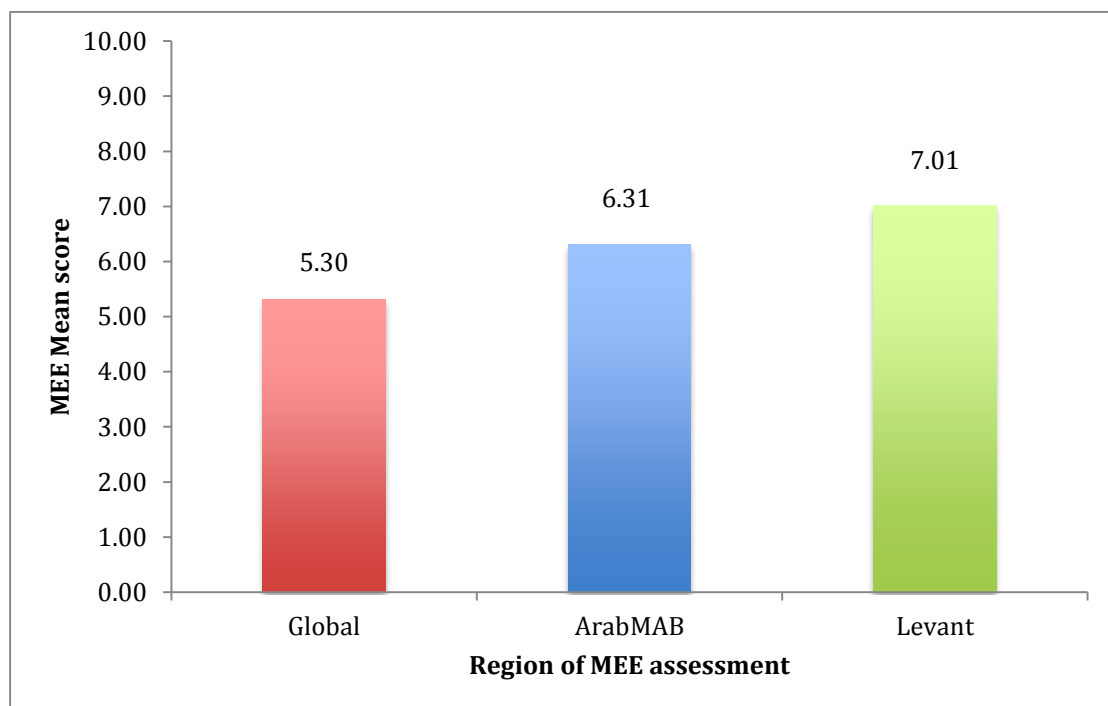
Fig. 17: Mean PA/BR MEE scores for ArabMAB (N=17), Levant (N=18) and Global (N=3184)

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[29] Mean scores are not directly comparable between different regions due to the use of different methodologies and types of protected areas. Hence the means obtained in the Global Study are used as a benchmark rather than a directly comparable population.

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6.2.5 Consistency of respondents

Arab BR representatives tended to be consistent in their rating. When asked to spontaneously estimate[30] the current standard of their BR management, 41% of respondents rated it as "sound", 53% "basic", and 6% "basic with major deficiencies", while no one perceived their management as "clearly inadequate" (23% had no operational management) (Fig. 18).
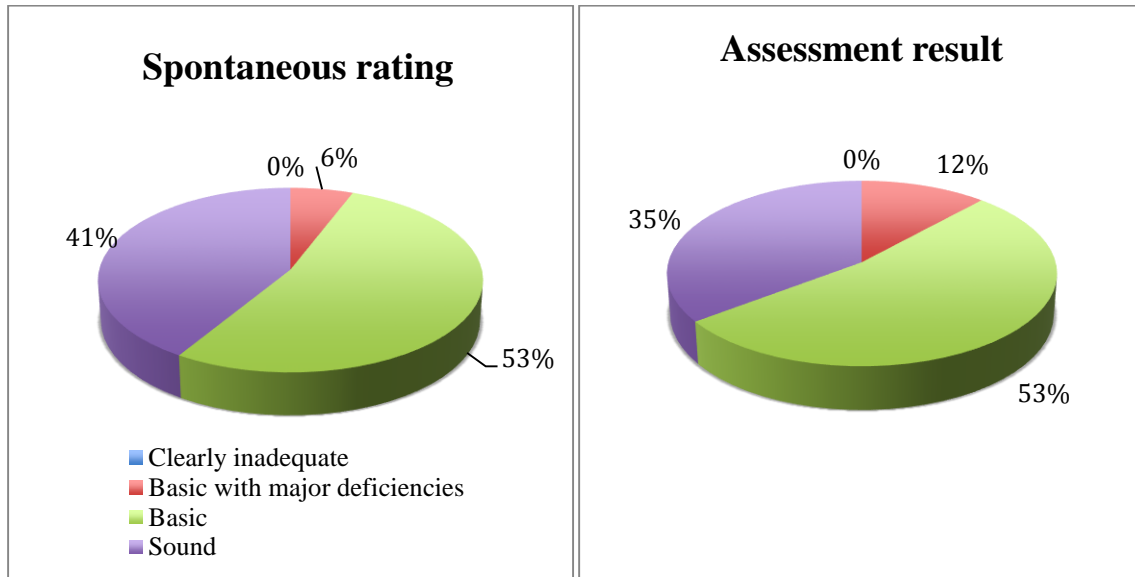
Fig. 18: Spontaneous rating of BR management by respondents compared to BREMi results (N=17)

In parallel, the quantitative analysis of the actual assessment conducted through the study, showed that 35% of BRs fall into the "sound management" category, 53% in the "basic", and 12% in "basic with major deficiencies" (Fig. 18). Consequently, the vast majority of respondents had an accurate estimate of their management performance before conducting the assessment (i.e "spontaneous rating" corresponds with the assessment result standard category), and only 6% of respondents "over-estimated" their management performance.

Though both evaluation methods ("spontaneous rating" and BREMi Framework used for the quantitative assessment) are subjective in nature and based on perceptions (Margoluis and Salafsky 2001; Persha and Rodgers 2002; Tucker 2005), this observed compatibility gives more credibility to the quantitative assessment. Indeed, it shows that respondents are not largely

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[30] Respondents were given the choice between the 4 management standards with the following explanation: "sound" = managed relatively well; "basic" = basic management in place, but can still be significantly improved; "basic with major deficiencies" = basic management in place with serious problems; "clearly inadequate" = barely any management taking place (seriously constrained management).

inflating their performance rating when they are faced with a scoring system and tend to be consistent with their opinions/evaluations. This comparison helps alleviate the limitation of the tool by reducing self-serving bias (Section 4.8.2).

6.3 Trends across different aspects of management

6.3.1 WCPA Framework elements and indicators results

General results show a tendency for the "planning" aspect of management to score highest and "input" the lowest. Mean scores were calculated for the 34 BHIs, revealing the following patterns (Fig. 19):

- 4 of the 6 "planning" indicators were among the 10 highest scoring BHIs. The lowest scoring planning indicator was legislation and policy framework.

- The 10 highest scoring indicators also included level of significance (values) and extent and severity of threats from the "context" element of the WCPA Framework, education research and monitoring from the 3 "outcomes" element, and 4 of 15 "context" elements.

- The lowest scoring "process" BHI is adequacy of law enforcement capacity (by staff mainly) (score <5.00).

- The lowest scoring "context" indicator is constraint or support by political and/or civil environment (score=6.04)

- All 5 "input" indicators scored among the 7 lowest scoring BHIs with adequacy of staff numbers, adequacy of infrastructure equipment and facilities, and security and reliability of funding being the most deficient "input" indicators (score<5.00).

- "Output" indicators scored in the "basic" range (score 5.01-6.66)

- None of the BHIs scored in the "clearly inadequate" range (<3.33)
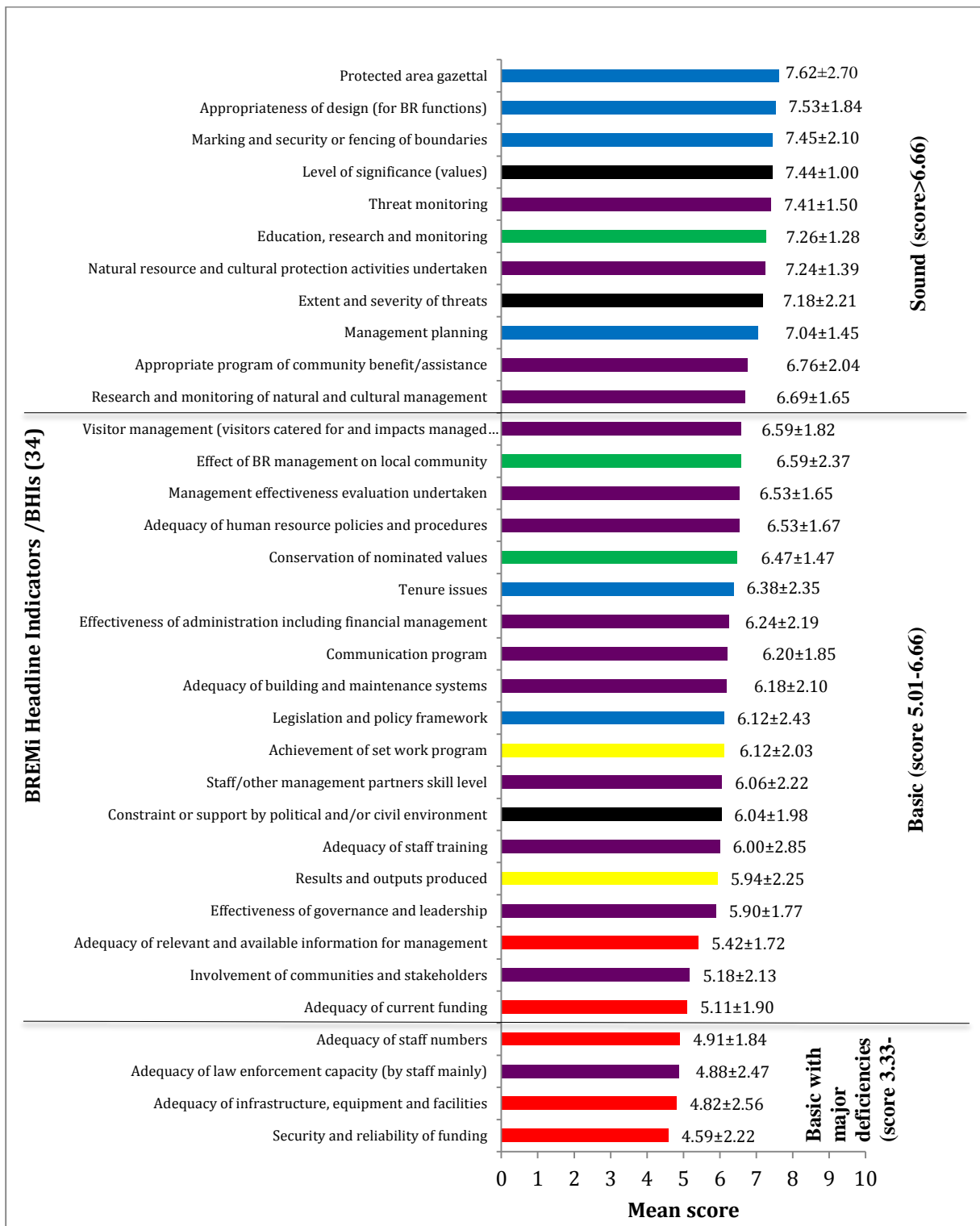
Fig. 19: Mean scores for BREMi Headline Indicators (BHI) in descending order (N=17)
Note: Colors used to indicate the element of the WCPA Framework include black for "context" factors, aqua for "planning", red for "input", purple for "process", yellow for "outputs", and green for "outcomes"

When mean scores were calculated for each of the WCPA element for the Arab BRs regional evaluation, results were consistent with the above data. Indeed, the "planning" element scored

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highest (7.05±1.18) followed by "context" (6.89 ±1.09), while the "input" indicator scored the lowest with a mean of 4.99±1.62 (Table 26).

Table 26: Mean scores of WCPA Framework elements for Arab-MAB in descending order (N=17)

Element	Mean	SD
Planning	7.05	1.18
Context	6.89	1.09
Outcomes	6.76	1.35
Process	6.37	1.20
Outputs	6.03	1.98
Input	4.99	1.62

When the elements mean scores were compared across ArabMAB countries, there was a significant difference in the "input" and "process*"* means between countries (p=0.029 and p=0.035 respectively). Further analysis to establish which *country element means* significantly differed from each other was limited by the small sample size (i.e post-hoc tests could not be performed because various countries had fewer than two cases).

6.3.2 Indicator importance results

As mentioned in Section 4.4.2.5, survey respondents were asked to rate each of the 65 indicators of the BREMi Framework (Table 19) as "important" or "not important" to the management effectiveness of BRs. The results of this rating show that none of the indicators were rated as "not important" by all of the respondents (not even by a majority of respondents), which reflects a perceived importance to all indicators in general by Arab BRs managers.

The highest count of "not important" rating was 5/17 (i.e. <50%) for only one indicator: "Staff number is adequate for effective management of the BR", followed by 4/17 for *staff is adequately allocated to reach management objectives*, and 3/17 for *staff is capable of enforcing policies and laws inside the BR*, and *visitors' impacts on values are controlled*. Interestingly, these 2 indicators with highest "not important" responses fall within the same BHI "C.1 Adequacy of staff numbers" (Table 19) indicating that this BHI/factor is relatively considered

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less important for the management effectiveness of BRs by Arab BR representatives, but only by a minority (5/17).

6.3.3 Comparison with regional and global results

Results show striking similarities between Global PAs management effectiveness evaluation and the ArabMAB, while some differences reveal interesting contextual specificities. Similarly to the Levant and Global Study results, "planning" is the most effective aspect of management. The three highest scoring indicators are all *planning* indicators, identical between the ArabMAB and Global Study results, and occuring in the same order i.e. *park gazettal*, *appropriateness of design*, and *marking and security or fencing of park boundaries.* In contrast, the Levant study results showed a very low score for *marking and security of fencing of park boundaries*, particularly noted for parks in Lebanon and Syria (Anthony and Matar 2012). Since the ArabMAB study excludes Syria and PAs that are not BRs, in addition to including the whole of North Africa, this can be explained by the specificity of this indicator's scores for PAs and for the Levant region.

Another similarity between the 3 regional studies results is in the lowest scoring "input" indicators related to resource constraints at the level of staffing and funding. However, a major difference was observed for *adequacy of law enforcement capacity* (*by staff mainly)* (process), which although scoring low both in the ArabMAB region and within the Levant (Anthony and Matar 2012), was rated much higher in the Global Study. In contrast, the presence of an *appropriate program of community benefit* was consistently better rated in the ArabMAB and Levant, as compared to the global PAs. Moreover, *management planning* is relatively better rated in the Arab region than in the Global Study showing more focus on the development of appropriate management plans in Arab BRs compared to PAs worldwide.

6.3.4 Summary and discussion

The ArabMAB BREMi evaluation has shown a "basic" level of management for BRs in the Arab States, which is comparable to the global average range. The lowest scores were attributed to "input" indicators pointing at resource constraints in terms of funding, staff, infrastructure and equipment as well as information. Other notable weaknesses in management relate to legislative aspects, including: *legislation and policy framework* (at the planning level) as well as *adequacy of law enforcement capacity* (at the process level). The contextual factor that had the lowest rating relates to political and civil support to the BR i.e. *support by political and/or civil environment.* Moreover, *involvement of communities and stakeholders* in BR planning and

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decision-making was one of the lowest scoring *process* BHI(s), which can partially explain the lack of civil support in the previous result.

The above results converge in many ways when interpreted in the framework of contextual aspects mentioned earlier as part of the Phase 1 results' discussion (Section 5.4). Indeed, political instability and conflicts have been reported as a threat to BR success (Stoll-Kleemann 2007) as they are likely conducive to less government emphasis on conservation, and a generally less supportive environment to BR management. Moreover, legislative enforcement capacity decreases in times of conflict, especially armed conflict, which could partially explain the lower score for legislative enforcement capacity. Moreover, the lack of integration of MAB into the national legislative framework and land use planning (Table 19, B.2.1 and B.2.2) presents one form of integration gap that can potentially be improved in the MAB program implementation in the Arab region to improve the MAB program's long-term sustainability in the region (Section 5.4.1.3).

In conclusion, the BREMi assessment constitutes the first regional evaluation of ArabMAB management effectiveness and reveals insights on strengths and weaknesses of management in the Arab region. In the following Section, the actual PR process and implementation in the ArabMAB region will be evaluated in order to better identify the evaluation needs of ArabMAB and the potential benefits of the different tools used for evaluation.

6.4 Periodic review report evaluation results

6.4.1 Compliance with the PR process

Implementation of the PR process in the Arab region has been generally slow. The review of the overall delays and submissions shows that 12 of 28 PRs (43%) are missing for full compliance including 2nd and 3rd reports for some BRs (Table 27).

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Table 27: Summary of PR submissions for Arab-MAB Network countries (till 2014)

	Biosphere reserve	Designation date	PR submission due date(s) 1996- 2014	No of PRs submitted (- missing reports)	Submission date(s)	Language
ALGERIA						
1	Tassili N'Ajjer	1986	1996	1	2013	Fr
2	El Kala	1990	2000, 2010	1 (-1)	2002	NA
3	Chrea	2002	2012	1	2012	Fr
4	Djurdjura	1997	2007	1	2011	Fr
5	Gouraya	2004	2014	(-1)	NA	NA
6	Taza	2004	2014	(-1)	NA	NA
	Total			**4 (-3)**		
EGYPT						
1	Wadi Allaqi	1993	2003, 2013	2	2004, 2012	En
2	Omayed	1981, 1998 (extension)	2008*	1	2011	En
	Total			**3**		
JORDAN						
1	Dana	1998	2008	1	2013	En
2	Mujib	2011	2021	NA	NA	
	Total			**1**		
LEBANON						
1	Shouf	2005	2015	NA	NA	NA
2	Jabal Al Rihane	2007	2017	NA	NA	NA
3	Jabal Moussa	2009	2019	NA	NA	NA
	Total			**NA**	**NA**	
MOROCCO						
1	Arganeraie	1998	2008	1	2010	Fr
2	Oasis du sud marocain	2000	2010	(-1)	NA	NA
	Total			**1 (-1)**		
QATAR						
1	Al Reem	2007	2017	NA	NA	NA
	Total			**NA**		
SUDAN						
1	Dinder	1979	1996, 1999*, 2009*	2 (-1)	2001, 2012	NA
2	Radom	1979	1996, 1999*, 2009*	1 (-2)	2001	NA
	Total			**3 (-3)**		
SYRIA						
1	Lajat	2009	2019	NA	NA	
	Total			**NA**		
TUNISIA						
1	Djebel Chambi	1977	1996, 2007**	1 (-1)	1999	NA
2	Djebel Bou-Hedma	1977	1996, 2007**	1 (-1)	1999	NA
3	Ichkeul	1977	1996, 2007**	1 (-1)	1999	NA
4	IIes Zembra et Zembretta	1977	1996, 2007**	1 (-1)	1999	NA
	Total			**4 (-4)**		

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Biosphere reserve	Designation date	PR submission due date(s) 1996- 2014	No of PRs submitted (- missing reports)	Submission date(s)	Language
U.A.E.					
1 Marawah	2007	2017	NA	NA	NA
Total					
YEMEN					
1 Socotra Archipelago	2003	2013	(-1)	NA	NA
2 Bura'a	2011	2021	NA	NA	NA
Total			**(-1)**		

*Calculated relatively to extension date (1998)

**Second and third due dates are calculated relatively to the baseline of designation date (10 years are added since start date). It is however undocumented how UNESCO-MAB calculates the PR due date for BRs designated at least 10 years before 1995.

NA = Not Applicable; Blue = Accessed from UNESCO but missing on UNESCO PR online database

Red = Reported in UNESCO database but not accessed during the study; Green = Indicates 1996 as the start date for the reporting requirement for those BRs designated before 1995 and already older than 10 years

Of the 16 PR reports submitted, only one was submitted on time (Chrea BR 2012), another was submitted one year before its due date (Wadi Allaqi 2013), while the large majority (14) was submitted with 1 to 17 years of delay. A significant number of BRs (10/26) in ArabMAB were designated before the Seville meeting (1995). For those BRs, the requirement to submit PRs started in 1996, however the actual submission dates show some inconsistency with the 10-year requirement.

For *French* and *English*, the language preferences used for PR reporting (Table 27) are consistent with the previously presented findings for Phase 2 (Table 22). Moreover, results suggest that the absence of *Arabic* language as an option for PR reporting (Section 2.3.6.2) may have a negative impact on PR compliance since half of the Sudanese and Yemeni due PR reports (combined) are missing (Table 27), while both countries have shown a language preference for *Arabic* in the survey (Table 22). However, this analysis cannot draw definitive conclusions on the association between language and PR compliance, and further research directly testing this association will be needed to validate it.

While the Section above summarized the situation of PR reporting for the Arab region, the following Sections present the findings from content analysis of the 7 accessed[31] PR reports (Section 4.5.2).

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[31] All 16 PR reports submitted from the Arab region to UNESCO-MAB authorities were solicited from the Secretariat (several times), however only 7 were provided/accessed.

6.4.2 Report quality and compliance with Article 4 of the Statutory Framework

The quality of collected ArabMAB reports varies, and has been rated on a scale of "poor, average, good" based on 3 criteria:

1. *Comprehensiveness:* all Sections required by the PR Form (old format) are covered in the report.

2. *Readability:* the language is clear and comprehendible, and the text is coherent.

3. *Structure and formatting*: the report is well structured and formatted (including visuals etc.).

When rating the reports quality, "poor" referred to reports with at least 2 of the above criteria not fulfilled, "average" to 1 criterion missing, and "good" to reports responding to all 3 criteria. The results of this analysis for 7 Arab PR reports are presented below (Table 28). It is important to note that this analysis excludes Annexes (and their requirements), which were not accessed for most reports.

Table 28: Quality of PR reports from the Arab region (N=7)

Country	Biosphere reserve*	PR submission year	Report quality	Comments
Algeria	1	2013	Average	1. Missing "Conclusion" chapter
				2. Minor editing and formatting errors.
	2	2012	Good	1. Report is complete
				2. Structure and format conform with PR Form
				3. Readability is good
	3	2011	Good	1. Comprehensive
				2. Structure and format conform with PR Form
				3. Readability is good
Egypt	1	2012	Poor	1. Sections missing including "Conclusion"
				2. Poor readability, and formatting
	2	2011	Poor	1. Sections missing including "Conclusion"
				2. Poor readability, and formatting
Jordan	1	2013	Average	1. Very good structure and formatting
				2. Comprehensively covers all sections except the "Conclusion" chapter which is totally missing
Morocco	2	2009	Good	1. Comprehensive
				2. Structure and format conform with PR Form
				3. Readability is good

*BR names were omitted to respect anonymity

In addition, an analysis of PR report content relating to the "conclusion Chapter" was conducted with the aim of identifying the effectiveness of the PR process in reaching its core objective of

evaluating compliance with Article 4 of the Seville Statutory Framework. Results show that 4 of 7 reports did not address the Chapter at all, while the remaining 3 differed in their approach to addressing the 7 criteria (Table 29).

Table 29: Addressing compliance with Article 4 in PR reports from the Arab region (N=7)

Country	Biosphere Reserve	PR submission year	Description of answer to the "Conclusion" chapter on addressing Article 4	Length of answer (number of pages)
Algeria	1	2013	*Not at all*	0
	2	2012	Very long	4.5
	3	2011	Too long and elaborate	7.5
Egypt	1	2012	*Not at all*	0
	2	2011	*Not at all*	0
Jordan	1	2013	*Not at all*	0
Morocco	1	2009	▪ Very short ▪ Answers are not always describing the "how", rather "what" is being done, hence not explanatory enough. ▪ Missing section on "challenges encountered"	2.5

*BR names were omitted to respect anonymity

Some reports had an unnecessarily long and elaborate answer to the question, which is not required since the PR "Conclusion chapter" explicitly requires a "<u>brief</u> justification of the way in which the biosphere reserve fulfils each criteria of article 4 of the Statutory Framework of the World Network of Biosphere Reserves" (Appendix 1.1 Chapter 9, or Appendix 1.2 Chapter 8). On the other hand, other reports had too brief answers, which didn't adequately tackle the question. Hence, the findings show a lack of standard understanding of the requirements of this Section of the PR reporting form.

6.4.3 Discussion of periodic review report evaluation results

In summary, the results of compliance with the PR process showed a large gap in implementation, which reflects the limited effectiveness of the PR as a tool for "quality control" in the Arab region. Significant delays and non-response reported at a global level suggest that the ArabMAB's reporting status is similar to the global PR status (Price *et al.* 2010; UNESCO 2009). Regional analyses are very limited; however, data from the Canadian review of PRs (Reed and Egunyu 2013) shows striking differences in compliance in comparison with the Arab BRs. Indeed, a similar review in Canada, showed that all 15 PRs- due for submission by the

Canadian BRs- were submitted in a timely manner and included clear evidence of compliance with the criteria of Article 4 (Reed and Egunyu 2013). Further research is needed to identify regional differences and factors of success to the PR process, with the aim of providing learning opportunities and improving the process.

Moreover, the complete omission of the "conclusion chapter" (on compliance with criteria of Article 4) in more than half (4/7) of the PRs analysed reflects a plausible lack of understanding of the importance of this Section for the evaluation overall, and consequently a lack of understanding of the PR process by local stakeholders completing the evaluation. Other explanations could be: (1) responding because it is being demanded, without perceiving the value of the process as a positive self-serving and learning tool for management improvement; (2) respondent's lack of belief in the seriousness of the PR process and implications; and/or (3) respondent fatigue since it is the last chapter of a rather long comprehensive form (Ben-Nun 2008). Further research will be needed to identify and/or validate potential causes, as this study was not designed to address this question. In parallel, the variability of report quality indicates an opportunity to improve local capacities to evaluate and complete the evaluation. In contrast with the Canadian MAB, the ArabMAB has not yet reached institutionalization and volunteered expertise for the PR process, which largely influences its effectiveness (Reed and Egunyu 2013). Hence, the PR procedure in the Arab region likely requires considerable financial resources and local expertise that are still lacking (Price *et al.* 2010).

Although a large number of Arab BRs did not comply, or poorly complied with the PR evaluation process and criteria, so far none of them has been removed by UNESCO from the WNBR. This finding is consistent with the global enforcement by UNESCO-MAB authorities, which has been very flexible with delays and rather weak to date (Section 2.3.6.2). The lose implementation of the "BR delisting" by UNESCO-MAB is likely benefiting BRs locally by allowing more time for the National MAB Committees/Focal Points to seek assistance from the regional UNESCO-MAB offices in making appropriate adjustments and improving compliance with BR requirements (and/or ICC recommendations) before resubmission. However, the recent decision to implement the "Exit Strategy" reflects UNESCO's plan to tighten its control on PR review requirements and consequences of non-compliance. This decision emphasizes the need for more timeous and effective submissions of PRs by ArabMAB Focal Points, which in turn, will require substantial improvement of local capacities.

CHAPTER 7: DETERMINING FACTORS OF BIOSPHERE RESERVE MANAGEMENT EFFECTIVENESS IN THE ARAB REGION

Following the examination of management evaluation and performance of the Arab BRs presented in the previous Chapter, this Chapter focuses on aspects of management that most determine the overall management effectiveness and outcomes. Based on survey and *in-depth interview* findings, and building on literature and previous Chapters, the following questions are explored:

Q4: a) What factors most determine BR management effectiveness in the Arab region?

b) How do these factors compare to the globally identified factors?

7.1 Factors influencing overall management and outcomes

In order to identify and explore factors that most strongly affect the performance of BRs in the Arab region, relationships between selected variables and overall BREMi scores were explored. In addition survey data were tested for correlations between BHIs and total BREMi scores using corrected item-total correlations (referred to as corrected correlations) based on Pearson's Correlations. Pearson's Correlations were calculated between BREMi overall scores and the 3 outcome BHIs - *conservation of nominated values; effect of BR management on local community; education, research and monitoring-* that reflect the functional goals of BRs i.e. (1) conservation of values, (2) sustainable development[32], and (3) logistic support (Chapter 2). When interpreting these findings, it is important to keep in mind that correlation does not necessarily imply a causative relationship. However, in the scope of this research, it helps identify what factors successful BRs in the Arab region are mostly characterized by.

7.1.1 Factors of management determining overall effectiveness in ArabMAB

7.1.1.1 Factors characteristics to the Arab biosphere reserves

Based on findings and insights from Anthony and Matar (2012), potential independent factors that might influence BR performance (Sections 2.4.4, 2.4.5) were tested for (Section 4.4.3.4). These include: (1) existing previous MEE; (2) start date of management; (3) staff number (of main managing institution); (4) period of designation as BR selected with a cut-off point of 1995 (<1995 vs. ≥1995) marking the Seville meeting and associated changes (Section 2.3.3.2).

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[32] In the scope of this research "effect of BR management on local community" is considered equivalent to the second BR function i.e "sustainable development", since it is defined as "BR socio-economically benefits the community" (Table 19 in Chapter 4)

First there was no significant difference found in BREMi scores of BRs who conducted a previous MEE (41% of sample) compared to those who didn't (59%) (p=0.400), showing that "previous MEE" was not a determining factor of BR management effectiveness in this study, in contrast to findings of the Levant study (Anthony and Matar 2012). However, it is relevant to note that respondents interpreted "MEE" in different ways; hence their perception of "what a management evaluation is" was assumed to be an MEE, which might have influenced this result. Secondly, the correlation between "start date of management" (of the BR by main managing institution) and BREMi score of the BR was weak (R=-0.180) and not significant (p=0.49). Thirdly, there was a medium (R=0.314) but non-significant (p=0.220) relationship between staff numbers and BREMi scores, which is in line with the finding that *adequacy of staff numbers* is the indicator considered least important by Arab BR managers relatively to the remaining 64 indicators assessed for importance (Section 6.3.2). Fourth, there was no significant difference found in BREMi scores of BRs designated before 1995 compared to those designated starting 1995 (p=0.869), which implies no significant impact of the introduction of the PR process and other requirements (management planning, functional zoning) on the management effectiveness of BRs in the Arab region. In conclusion, none of the 4 factors studied were significantly influencing the management effectiveness of the Arab BRs studied.

On the other hand, of the 34 BHIs, 21 were strongly and positively correlated with the BREMi overall management effectiveness score (R>0.50), as presented in Table 30.

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Table 30: Pearson's correlations and corrected correlations of BHI(s) with BREMi mean scores

BHI	Pearson's correlation with BREMi score	Corrected correlation[1] with BREMi score
Education, research and monitoring	0.863**	0.854
Achievement of set work program	0.836**	0.816
Conservation of nominated values	0.809**	0.794
Effectiveness of administration including financial management	0.764**	0.737
Communication program	0.721**	0.694
Results and outputs produced	0.725**	0.693
Constraint or support by political and/or civil environment	0.709**	0.678
Research and monitoring of natural and cultural management	0.683**	0.657
Adequacy of law enforcement capacity (by staff mainly)	0.681**	0.641
Appropriateness of design (for BR functions)	0.653**	0.623
Adequacy of building and maintenance systems	0.631**	0.593
Natural resource and cultural protection activities undertaken	0.616**	0.591
Staff/other management partners skill level	0.619**	0.579
Adequacy of human resource policies and procedures	0.607**	0.575
Adequacy of staff numbers	0.605*	0.571
Involvement of communities and stakeholders	0.609**	0.568
Security and reliability of funding	0.601*	0.558
Visitor management (visitors catered for and impacts managed appropriately)	0.591*	0.555
Effectiveness of governance and leadership	0.590*	0.555
Level of significance (values)	0.567*	0.547
Adequacy of infrastructure, equipment and facilities	0.571*	0.519

**Significant at p<0.01; *Significant at p<0.05

[1]Notes:

- Only strong positive corrected correlation values are presented, and in decreasing strength

- Cronbach's alpha= 0.917

On the other hand, there was a very small and non-significant correlation of overall management performance with *protected area gazettal* and other indicators pertaining to tenure issues, and legislative framework (Table 31).

Table 31: Smallest 5 corrected correlations of BHI(s) with BREMi score

BHI- *element*	R-value*
Tenure issues- *planning*	0.175
Protected area gazettal- *planning*	0.170
Extent and severity of threats- *context*	0.136
Marking and security or fencing of boundaries- *planning*	-0.022
Legislation and policy framework- *planning*	-0.181

* p>0.05 (not significant)

Indeed, of the 5 smallest correlating BHIs with the BREMi scores, all directly or indirectly relate to legislation and 4 of 5 fall in the *planning* category[33]. The same indicators scored relatively well (Fig. 19) showing that these aspects of BR management planning in addition to the assessment of threats are relatively well achieved in the Arab region. However, they do not seem to be strong determinants of overall management effectiveness.

7.1.1.2 Consolidated strengths and weaknesses in ArabMAB management

Of the 11 highest scoring BREMi indicators ("sound management"in Fig. 19), 5 were also largely positively correlated with overall mean BREMi score, including *education, research and monitoring*; *research and monitoring of natural and cultural management; appropriateness of design (for BR functions); natural resource and cultural protection activities undertaken*; and *level of significance* (Table 30). These factors can therefore be potential strengths of Arab BR management. In contrast, factors that showed large positive correlations with overall management effectiveness and scored in the lowest range ("Basic with major deficiencies" in Fig. 19) point at weaknesses. These include: *adequacy of law enforcement capacity (by staff mainly)*; *adequacy of staff numbers*; *involvement of communities and stakeholders*; *security and reliability of funding*; and *adequacy of infrastructure, equipment and facilities* (Table 30, and Fig. 19). In general, these factors indicate gaps in resources, capacity and participatory management.

When matched with the results of informal interviews (Chapter 5) and document reviews (Chapter 6), *education, research and monitoring* stands out as a consolidated strength of ArabMAB management, while recurrent weaknesses include *involvement of local communities and stakeholders in decision-making; adequacy of law enforcement capacity (by staff mainly);* and general resource gaps including technical and financial capacity.

7.1.1.3 Comparison with the Global Study findings

A similar analysis using corrected item-total correlation in the Global Study showed interesting similarities and differences in results. Comparative analysis shows that 2 of the 5 largest positive corrected correlations are similar in the ArabMAB and Global Study findings; both of which are *process* indicators: *effectiveness of administration including financial management*, and *communication program* (Table 32).

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[33] Refer to Table 19 A2, B1, B2, B3 and B4 for more details about the definition of these BHIs

Table 32: Largest 5 corrected correlations of indicators with mean management effectiveness scores in Arab-MAB study compared to Global Study

ArabMAB study BHI-*element* (R value)	Global Study Indicator-*element* (R value)*
Education, research and monitoring**-*outcome* (0.854)	Adequacy of infrastructure, equipment and facilities- *input* (0.70)
Achievement of set work program-*output* (0.816)	**Effectiveness of administration including financial management- *process* (0.70)**
Conservation of nominated values-*outcome* (0.794)	Natural resource and cultural protection activities- *process* (0.67)
Effectiveness of administration including financial management-*process* (0.737)	**Communication program- *process* (0.67)**
Communication program-*process* (0.694)	Adequacy of law enforcement- *process* (0.66)

*Source: Leverington *et al.* 2010b
**This indicator is not included in the Global Study HIs
Note: Common indicators to both studies (for the purpose of this comparison) are in **Bold**

This finding reflects the critical importance of effective administrative and communication processes to the functioning of conservation sites, and specifically BRs regionally as well as globally. Moreover, the ArabMAB study showed large positive correlations between overall management effectiveness (BREMi) scores and the two outcome BHIs *education, research and monitoring*, and *conservation of nominated values* (Table 30), and a weaker medium positive correlation with *effect of BR management on local community* (corrected correlation R=0.459, p<0.05). In contrast, only small positive correlations were found in the Global Study between the mean management effectiveness score and the 2 outcome indicators of PAs: *conservation of nominated values-condition* (R=0.37) and *effect of park management on local community* (R=0.30) (Leverington *et al.* 2010). This finding points at potential disparities between regions in the extent to which achievement of management effectiveness is associated with achievement of management outcomes. Further research using similar methods for comparison would be of interest to shed the light on this association in different regions of the world.

Finally, similarities were found for the ArabMAB and the Global Study, in which PA/BR establishment indicators related to gazettal, boundary marking, and tenure resolution scored relatively well (Fig. 19), but had a small corrected correlation with the overall mean Table 31) (Leverington *et al*. 2010b). The consistency of this finding in the ArabMAB region and globally suggests that - in general - though the establishment of the PA and BR zones' boundaries, and clarity around tenure issues and legislation frameworks are important for the baseline establishment of PAs and BRs, they do not specifically determine overall management success. Further studies will be needed to validate the generalizability of this finding to other regions as well.

7.1.2 Factors that best predict management outcomes in ArabMAB

The following Tables (33, 34 and 35) present the BHIs that showed significant and large/strong positive correlations with the 3 respective outcome indicators of management, which reflect the 3 functional goals of BRs: (1) conservation of nominated values, (2) effect of BR management on local community, and (3) logistic support (education, research and monitoring).

Table 33: Largest positive correlations of BHI with *conservation of nominated values*

	BHI- *element*	**Pearson's Correlation (R) with *outcome 1***
1	Achievement of set work program- *output*	0.860**
2	Results and outputs produced- *output*	0.789**
3	Effectiveness of administration including financial management- *process*	0.757**
4	Education, research and monitoring- *outcome*	0.750**
5	Research and monitoring of natural and cultural management- *process*	0.695**

**p<0.01

Table 34: Largest positive correlations of BHI with *effect of BR management on local community*

	BHI- *element*	**Pearson's Correlation (R) with *outcome 2***
1	Achievement of set work program- *output*	0.699**
2	Appropriate program of community benefit/assistance- *process*	0.689**
3	Education, research and monitoring- *outcome*	0.554*
4	Natural resource and cultural protection activities undertaken- *process*	0.494*

**p<0.01; *p<0.05

Table 35: Largest positive correlations of BHI with *education, research and monitoring*

	BHI- *element*	**Pearson's Correlation (R) with *outcome 3***
1	Conservation of nominated values- *outcome*	0.750**
2	Research and monitoring of natural and cultural management- *process*	0.736**
3	Adequacy of human resource policies and procedures- *process*	0.710**
4	Achievement of set work program- *output*	0.700**
5	Communication program- *process*	0.695**

**p<0.01

Consistent with the corrected correlations' results found for BHI(s) with overall management effectiveness (Table 32), the aspects of management relating to outputs, outcomes, and processes are the most largely/strongly related to outcomes (Tables 33, 34, 35). Specifically, the output BHI *achievement of set work program* is consistently among the most strongly

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related factors to all 3 outcomes as well as overall management effectiveness. It is therefore to be considered one of the best predictors of BR overall management effectiveness and implementation of functional goals in the Arab region. Three other BHIs also related to the presence and/or implementation of a working program were found to be largely related to effective outcomes:

- *results and outputs produced* largely and highly significantly correlated with outcome/function 1: *conservation of nominated values* (R=0.789, p<0.01) (Table 33);

- *appropriate program of community benefit/assistance* and *natural resource and cultural protection activities undertaken* strongly correlated with outcome/function 2: *effect of BR management on local community* (R=0.689 p<0.01, and R=0.494 p<0.05 respectively) (Table 34);

- *communication program* largely correlated with outcome/function 3: *education, research and monitoring* (R=0.695) (Table 35).

These findings indicate that the development and implementation of appropriate programs of work that target all 3 functional goals of BRs, are likely factors that promote the successful implementation of the BR concept and achievements of its functional goals in the Arab region. This result suggests that for ArabMAB, though input and processes are part of the enabling factors to develop and implement appropriate programs of work, it is the appropriateness and implementation of such programs that most largely determines management performance.

Other strong predictors of Arab BRs management outcomes were indicators related to *education, research and monitoring; effectiveness of administration including financial management; and communication program*. These results reveal a consistency between predictors of overall management effectiveness (Table 32) and of outcomes (Tables 33, 34, 35). Hence some of the same factors that most influence overall management effectiveness of BRs also influence their final outcomes, a finding not observed in the Global Study (Leverington *et al.* 2010b), nor in the Levant study (Anthony and Matar 2012). Finally, an interesting finding of this analysis is that the 34th BHI[34] i.e. *education, research and monitoring* was the largest predictor of overall management effectiveness of Arab BRs (Table 32), of *conservation of nominated values* (Table 33), and of *effect of BR management on local community* outcomes

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[34] Note: this indicator was added in the BREMi Framework to the 33 HIs of the analytical framework (CRF) (Leverington *et al.* 2010b) to integrate the third function of BRs, a characteristic that is not considered a main function of PAs (Chapter 4)

(Table 34). This finding emphasizes the importance of adapting MEE tools to the specific functions and objectives of BRs, and of decoupling the analysis of determinants of overall management effectiveness from the analysis of determinants of each PA/BR outcomes (Sections 2.2.3.6, 4.8.2).

7.1.3 Summary and conclusions

In conclusion, the above findings reveal regional differences in terms of characteristic factors of effective management of Arab BRs compared to global PAs findings (partially including BRs). The following conclusions are most relevant to addressing Q4:

1. Overall ArabMAB management effectiveness is mostly determined by achievement of outputs and outcomes, as compared to global PAs/BRs that are more largely determined by input and processes. Though input and processes are enabling factors to reach set outputs and outcomes, the latter are stronger predictors of overall BR management effectiveness. Moreover, these findings imply that programs of work are appropriately focused on outputs and outcomes and that management is result-oriented.

2. *Effectiveness of administration including financial management* and *communication program* are standard process-related predictors of management effectiveness across the Arab region and globally. For the ArabMAB, these BHIs scored in the "basic" range (6.24 and 6.20 respectively) (Fig. 19). Hence, they are not areas of urgent concern for the ArabMAB Network, but do constitute important areas for improvement. Individual BR results for these indicators need to be considered more carefully to identify those that require more attention in both indicators.

3. Arab BRs with high overall management effectiveness scores (BREMi) are more likely to be achieving their outcomes as well (i.e. the three BR functions), than those with lower BREMi scores; a relationship not observed in the Global and Levant studies.

4. Presence and implementation of appropriate programs of work influences achievement of BR functional goals (outcomes) and overall management performance in the ArabMAB. *Achievement of set work program* is consistently a strong predictor of overall management and outcomes, while *appropriate program of community benefit/assistance* and *communication program* are respectively good predictors of *effect of BR management on local community*, and *education, research and monitoring* outcomes. This finding coupled with the previous one, consolidates earlier results suggesting that the management of BRs is "outcome-centred" and that management plans and programs are appropriately designed to achieve outputs and outcomes.

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The above findings provide a first level of understanding of potential factors influencing BR management effectiveness in the Arab region based on the survey. Given the use of the Global Study as a comparative framework, useful insights on differences and similarities of ArabMAB with global PAs were drawn. Major differences in results on main predictors of management effectiveness and outcomes point at the need for a more in-depth understanding of BR-specific influencing factors from a field perspective in the context of the ArabMAB region. The second part of this Chapter presents findings from face-to-face in-depth interviews with BR authorities, thereby addressing this research need (Phase 4).

7.2 Factors determining success and failure in the ArabMAB region, and major challenges to the effective implementation of the MAB program

With the aim of obtaining more BR-specific and region-specific information on factors influencing management effectiveness, interviewees were asked to identify and explain factors that determine success in their BR/country. For that purpose, they were requested to confirm or refute factors provided in the globally identified list of success factors (Table 5), and were provided the option to add factor(s) perceived of similar importance to their BR in their country (Appendix 3). As the GoBi study highlighted (Stoll-Kleemann 2007), this list of factors is generally applicable to BRs, however regional differences exist (Section 2.3.5.2). Hence, this part of the research attempts to identify similarities and differences and ground them in real field examples through the explanations provided by interviewees.

7.2.1 Factors determining success in ArabMAB Network and globally

Respondents from the different Arab countries agreed on most -but not all- the 19 factors identified in literature as determining factors of BR success (Table 5). Full agreement (Yes) (4/4 interviewees) was obtained for 12 of 19 factors as shown in Table 36. This finding confirms that these factors are perceived to play a major role in determining BR concept implementation regionally for the ArabMAB as much as globally (GoBi study).

Table 36: In-depth interviewee opinion on determining factors of BR success by country (N=4)

Response by country on importance (Y=Yes/N=No)				
GLOBAL FACTORS	**ALG**	**EGY**	**LEB**	**MOR**
Management factors				
Rural regional development measures	Y	Y	Y	Y
Environmental education	Y	Y	Y	Y
Research and monitoring (long-term)	Y	Y	Y	Y
Locally adapted involvement of the population	Y	Y	Y	Y
Practical nature conservation measures like reforestation or the fight against erosion	Y	N*	Y	Y
Evaluation for an adaptive management	Y	Y	Y	Y
Good working relations and cooperation with authorities	Y	Y	Y	Y
Law enforcement (inter alia use of sanctions)	Y	Y	Y	Y
'Leadership'	N	Y	Y	N
Sufficient (qualified) staff in the biosphere reserve	Y	Y	Y	Y
Governance factors				
Political support at the regional level	Y	Y	Y	Y
Appropriate funding	Y	Y	Y	Y
Absence of corruption	N	N	N	N
Modern nature conservation programs and laws	Y	N*	Y	Y
Absence of counterproductive and competing governmental programs	N	Y	N	Y
Adequate institutional design; precise distribution of responsibilities between authorities	Y	Y	Y	Y
Compensation for use restrictions	N*	Y	Y	Y
Clear demarcation of borders	Y	N	Y	Y
Local communities supporting the biosphere reserve	Y	Y	Y	Y
ADDITIONAL FACTORS CITED BY RESPONDENTS				
Communication at all levels (*management factor*)	NA	NA	NA	Y
Land tenure issues (*governance factor)*	NA	Y	NA	Y

*No explanations provided by respondent
NA= Not Applicable i.e. the respondent didn't spontaneously mention this factor

7.2.2 Differences in "determining factors of success" within ArabMAB countries, and with globally identified factors

After reflecting on the specific management and governance contexts of their countries, respondents perceived some of the global factors as "non-determining" to the success of BR concept implementation in their own country. The following Section analyses "outlier" (negative) responses of the structured part of the in-depth interview (Table 36) (Section 4.6.3), in light of the explanations provided by the interviewees for each.

7.2.2.1 Clear demarcation of borders

Egypt's representative justified that *clear demarcation of borders* is not determining success of Omayed BR since people do not always respect these borders as he explains: "it is there, but it doesn't help the success because people encroach the protected land and still use it" (Egypt representative 2014), referring to illegal agricultural activities taking place in parts of a core area (public land) within Omayed BR. All other countries[35] firmly confirmed that this factor is critical. Lebanon[36] mentioned it as "the biggest problem […] we still don't know the limits of private vs. public lands inside the BR. The transition zone has easier demarcations because of existing settlements. Inside the buffer and core zones, it is less clear" (Lebanon representative 2014). However, it is relevant to note that the BR represented by the interviewee scored in the "sound" range for overall management effectiveness. This provides additional evidence that clear demarcation of boundaries doesn't specifically associate with overall management effectiveness performance (Table 31).

On the other hand, the Algerian representative, who also considered this factor as determining, explained that BR areas were fully superimposed to existing PA areas, and explained that PA zoning was changed from 5 zones to 3 in 2011 in order to adapt them to the requirement of the BR concept. Hence, the Algerian BRs conceptually meet the zoning requirements however the designation itself does not add any value to the existing PAs since they are fully superimposed and managed as PAs. The case of Algerian MAB therefore consolidates the "conceptual gap" identified in the informal interviews whereby PAs and BRs are not clearly differentiated conceptually (Sections 5.1.6, 5.4.1.2, and 5.4.2). This is also reflected during implementation in the case of Algeria where adjustments were made in PA zoning in order to align them to the BR concept requirements, however there were no accompanying programmatic changes at the level of management (Algeria representative 2014). This echoes the survey finding that many BRs are managed only as PAs in the ArabMAB (Section 5.3.2), which is potentially one of the consequences of the lack of differentiation of PAs and BRs (i.e. conceptual gap) identified in the region.

In conclusion, the findings and examples provided by the BR representatives from Egypt, Lebanon and Algeria consolidate the survey findings that though demarcation of boundaries and clarity around zonation and tenure issues are important, they do not necessarily relate with

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[35] In this context, "Country" refers to the country of the representative interviewed
[36] The Lebanese respondent is a BR manager and hence represents one opinion only (of 3 BRs in Lebanon)

successful management, nor achievement of outcomes in ArabMAB (Sections 7.1.1.3, 7.1.2). The lack of differentiation of the BR from a PA (i.e. the conceptual gap), as demonstrated in the case of Algeria, could be one of the underlying reasons for this absence of relationship. Another explanation is the weak legislative framework and enforcement capacity, shown to decrease in times of conflict and political turmoil. The case of Omayed BR where communities have illegally settled inside the BR and are using its resources, and the weak capacity of government to address this situation, shows that this problem intensified in the region as a consequence of the Arab Spring.

7.2.2.2 Absence of counterproductive and competing governmental programs

Another example of local differences is provided by the factor *absence of counterproductive and competing governmental programs* that Lebanon and Algeria considered as non-determining while Morocco and Egypt rated as determining, but with relatively less importance than other factors.

The Lebanese representative (2014) stated that there are "no competing programs felt at the level of government" while the Algerian counterpart found that existing programs are complementary rather than competitive. In contrast, Egypt found that this factor doesn't usually occur in the MOE, however they face the challenge of integration of the "BR program into the PA program and making it more effective" (Egypt representative 2014). Finally, the Moroccan interviewee agreed that this factor is important though it doesn't currently constitute a problem in the country as the BRs reinforce the visibility and importance of PAs rather than compete with them (Morocco representative 2014). Interestingly, Morocco and Egypt spontaneously identified the potential area of *counterproductive and competing governmental programs* to be between PA and BR programs at the government level. The results on this factor consolidate the importance of integration and alignment of the MAB program with other conservation and sustainability related programs within the Government agenda. This can be partially achieved through sectorial mainstreaming within the ministries that are responsible for the different related sectors (eg. Ministry of Agriculture for agricultural sector), as discussed in Chapter 5 (Section 5.4.1.3).

7.2.2.3 Leadership

Strong leadership was consistently reported as a more valuable factor of success in the context of weak legislative enforcement in Egypt and Lebanon. As stated by the Egyptian interviewee: "It is important because actions can be stopped through relational and leadership skills

regardless of lack of law enforcement" (Egypt representative 2014). The Lebanese counterpart independently mentioned the same belief: "leadership should be very strong. The personality of the leader/BR manager affects all relations with local and national stakeholders, and this is how most problems are resolved on the ground in the country, not through laws" (Lebanon representative 2014). This claim was substantiated by an example demonstrating how an illegal water well drilling project in the Lebanese BR was stopped by exercising political pressure on the owner of the project, which was made possible due to the BR manager's strong leadership and relationship with the regional (and influential) political leader. Underlying reasons for illegal activities were different though for the 2 countries. In the case of Egypt, illegal exploitation of land in certain areas was caused by "illegal occupation of land" as a consequence of the revolution. Political pressure however weakened capacity of the Government to enforce legislation and stop the activities. On the other hand, the illegal well development project in the Lebanese BR was fuelled by corruption.

In contrast to Lebanon and Egypt, the Moroccan and Algerian interviewees did not perceive *leadership* as a determining factor of success, as they both considered it of lesser importance at the central government level where roles and responsibilities are well defined and functions are mostly "administrative". However, they both mentioned that *leadership* is of value at the local level of NGOs representing communities (for Morocco), or at the level of tribes in Algeria (e.g. in Djurdjura BR).

7.2.2.4 Absence of corruption

The *absence of corruption* was the only governance factor consistently not considered a determining factor of BR success in the Arab region. Though recognized as existing in most countries, it was generally "accepted" as part of the general background context, and considered an integral part of the international contextual framework with different degrees of manifestation in diverse countries, rather than a specific issue to the Arab region. It is important to clarify that this finding does not translate into "corruption isn't an issue" as it has been mentioned as a very serious problem during interviews, but mostly when discussing weak legislative enforcement. Rather it could reflect the other (extreme) end of the situation whereby corruption is so deeply rooted in governance that BR managers take it as a "given" part of the background that won't be changed in the foreseen future. This might be one explanation why its prevalence is not considered by BR managers as specifically linked to BR performance,

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however more specific research on this subject is needed to clarify the perceptions of BR managers on corruption and its influence on BR management in ArabMAB.

7.3 Major challenges of Arab biosphere reserves

Open-ended questions of the *in-depth interview protocol* (Appendix 3, part 1) allowed for the collection of information about the main perceived challenges for successful implementation and management of BRs in the local context(s) of ArabMAB. The analysed results are presented in Table 37.

Table 37: Results of the unstructured part of the in-depth interviews

Country	Major challenges identified for ArabMAB by country
Egypt	Inappropriate allocation of zones from design/nomination phase
	Illegal practices as a consequence of political turmoil (Arab Spring)
Morocco	Institutional division of governance
	Absence of national legislation for MAB
	Weak capacity at the local/decentralized institutional level
Lebanon	Communication gaps with regional/international MAB institutions despite good communication with national MAB Focal Point
	Lack of cooperation within WNBR locally and regionally
	Communication gaps within governance institutions nationally
Algeria	Communication gap with MAB governance at all levels (absent)
	Disengaged national MAB Focal Point
	BR a "paper label" superimposed to existing PAs
	Inappropriate allocation of zones from design/nomination phase
	Poor branding and visibility of MAB/BRs nationally
Tunisia*	Absence of national legislation for MAB
	Inappropriate allocation of zones from design/nomination phase
	Low capacity of management staff
	Illegal/destructive practices as a consequence of political turmoil (Arab Spring)
	Institutional division of governance
	Disengaged national MAB Focal Point
	Lack of community involvement since nomination phase (top-down approach)
	Communication gaps at all levels including with MAB institutions
	Lack of support and ownership by local communities
	Unsustainable financing mechanisms

*Source: Tunisia did not participate in the in-depth interviews, however similar information was collected through personal communication with 2 representatives of PA central authorities at the WPC 2014.

These findings consolidate important themes identified earlier in the research as main gaps and challenges of BR management (Sections 5.4.3, 6.3.4), including: communication, absence of national legislation for MAB, community involvement and participation in decision-making, institutional integration and alignment, law enforcement capacity, resource and funding constraints as well as lack of cooperation within the WNBR.

Additional challenges were identified through the in-depth interviews, including:

1. Inappropriate zoning since design/nomination phase, which led to complications and later adjustments for retaining the BR designation and complying with the UNESCO-MAB requirements for both Egypt (Omayed), and Algerian BRs that were inappropriately superimposed to Algerian PAs.

2. Poor visibility and branding of MAB/BRs nationally: Reported as an observation in Algeria where other international programs such as Ramsar were mentioned as very strongly promoted and well known to all public and political figures, which helped increase ownership and effectiveness. This was noted in contrast with the MAB program, which was perceived to be lacking visibility and promotion in the country. "Lack of visibility and branding of MAB" was identified as one of the key findings of the MAP evaluation at a global level (Section 2.3.6.1).

3. Illegal and destructive practices as a consequence of political turmoil: Political turmoil during the recent events in the Arab region labelled as Arab Spring have had consequences on BRs by indirectly fuelling illegal or destructive activities, and weakening Government's capacity for law enforcement. Indeed, Tunisian authorities reported that "Ichkeul" and "Chaambi" BRs, the 2 BRs with the largest national investments for BR program implementation from Government, were both "attacked by their own local communities" during the revolution (Tunisia representative 1 pers. comm.). The underlying causes of these "attacks" were related to dissatisfaction of the local communities with the management; while political turmoil only created an enabling environment for the expression of people's frustration. The Tunisian government officials explained this dissatisfaction as the result of lack of involvement of local communities in the planning and decision-making of the BR since the nomination phase (Tunisia representative 1 pers. comm.; Tunisia representative 2 pers.comm.).

4. Disengaged national MAB Focal Points: This finding confirms the reported institutional gaps in the governing institution of the ArabMAB identified through the informal

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interviews (Sections 5.1.5, 5.4.1.4). Specifically, Tunisia and Algeria representatives mentioned that MAB Focal Points are assigned to academic figures that don't specifically have interest nor motivation to engage in the program and hence often remain disconnected from BR managing parties. This in turn reduces the effectiveness of the program and the motivation of local BR managers who miss the support they need from their country's MAB Focal Points.

CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

The final Chapter of the thesis provides a summary and discussion of the major findings in the perspective of the background literature and through the lens of AM and ACM theoretical frameworks (Chapter 3). Important themes discussed are followed by related recommendations to the different stakeholders that can benefit from the findings of this research, thereby completing Phase 5 of the research design (Tables 14, 15). The Chapter then presents the original contribution of the research to the field of BR management and evaluation, and its indirect contribution to conservation and sustainability agendas. The usefulness of the research outcomes to policy planning and management are also discussed. Finally, the Chapter closes with insights from the author, and a presentation of areas of interest for further research.

Thus, the following Chapter addresses Q5:

> **Q5. How can the research findings be used to improve MAB program implementation in the Arab region?**

Answering this last research question (Q5) leads to the resolution of the overarching research question of the dissertation:

> **How can the BR concept implementation and management effectiveness be improved in the Arab region?**

8.1 Current status and potential of ArabMAB management

The general BREMi score of the region (6.31) shows a slightly better management status than the benchmark average performance of PAs (inclusive of BRs) as reported in the Global Study[37]. Identified management difficulties faced by ArabMAB are therefore not debilitating, as they are not leading to major deficiencies or inadequate management. This baseline status makes it easier to devise plans to tackle weaknesses at the level of individual BRs and ArabMAB. Moreover, the MAB program is well perceived among local authorities as most agree that it adds value to existing PA programs by integrating the social/human aspect into the conservation program (Phase 4). Indeed, in spite of the social and political turmoil that the Arab

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[37] It is relevant to note that the Global Study is not representative of all countries, as certain important regions of the globe were not included, such as the United States.

region is experiencing, study participants from the ArabMAB countries[38] have generally expressed willingness and interest to engage more effectively in the program.

In order to improve the implementation of the MAB program in the Arab region, its identified strengths and main determining factors of success will need to be leveraged, while challenges and gaps are addressed for better medium to long-term management performance. Based on this research, the main strength of the MAB program implementation in the Arab region pertains to *education, research and monitoring*. This factor is most likely the largest driver of successful MAB program implementation in the Arab region, since "environmental education" is ranked as the most important influencing factor of success in a global survey of 213 BR managers in 78 countries, while "long-term research activities" is ranked third of 27 factors in total (Stoll-Kleemann and Welp 2008)[39]. From that perspective, opportunities to use the relatively successful *education, research and monitoring* aspects of BR concept implementation and management in the Arab BRs for improving the weaker (but equally important) aspects of its management should be explored. These weaker aspects, considered as challenges of the ArabMAB Network, are developed in the section below.

8.2 Priority areas and long-term strategies

Challenges were defined as "priority areas" for improvement when they were consolidated by the different methods i.e. recurring themes in results of the different phases of the methodology (Table 15). These identified priority areas are largely intertwined, as are the proposed recommendations to address them.

8.2.1 Priority area 1: Communication, cooperation, and collaboration

Based on this research, *communication, cooperation and collaboration* is the largest challenge faced by the ArabMAB Network as it's been highlighted in the results of all phases of the research. Communication breakdowns have been reported 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. Interestingly, this issue has been identified as a major weakness and

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[38] This finding is not to be generalized to countries/BRs largely afflicted by recent conflicts (Syria and South Sudan), and/or those that did not participate in the research.
[39] The findings from this global survey are particularly relevant to this research on ArabMAB Network as half of its respondents are from developing and transition countries (Stoll-Kleemann and Welp 2008)

priority action area for the MAB program internationally, based on the MAP evaluation report (Section 2.3.6.1):

> "*Cooperation, management and communication has been consistently rated as the highest priority action area for the future. Within this action area, strengthening the capacities and resources for managing and governing BRs is consistently reported as the highest priority for the future.*" (UNESCO 2014d, 60-64)

Hence, the problem is a regional reflection of a global issue of the MAB program that needs to be addressed.

Schultz and colleagues (2011) report "dialogue, collaboration and integration of objectives" as one of the essential features of the ACM approach that contributes to the effective management of BRs, which emphasizes the importance of tackling the problem for Arab BRs. As stipulated by Armitage *et al.* (2009), the development of cross-scale and multi-level linkages is needed to enhance ACM. This applies specifically to BRs where the governance is intrinsically multi-level and involves stakeholder decisions at national, regional and international scales (Fig. 6). Hence, the ArabMAB will need to improve linkages and establish an effective basis to regularize the flow of information, promote shared understanding and articulation of problems regionally and with international governing authorities (e.g. UNESCO MAB Secretariat). Moreover, solving issues will require collaborative and adaptive approaches that recognize and integrate different sources and types of knowledge (expert and non-expert).

Addressing the challenge of communication, collaboration and cooperation through improved linkages and adaptive co-management entails changes and developments at different levels, including:

1. *Planning:*
   - Creating social and institutional space for interactions in order to incorporate or improve communication channels between the different stakeholders involved.
   - Budgeting for communication strategy development and implementation, collaborative processes and cooperation with other BRs and regional networks.
   - Leveraging MAB institutions to create cooperative partnerships with other BRs (twinning opportunities) that share common interests and creating mechanisms for knowledge exchange and learning from experiences.
2. *Processes:* tools and mechanisms should be developed and enhanced and incorporated into processes and implementation to allow for shared decision-making (i.e. workshops, knowledge-exchange platforms etc.).

3. *Inputs and capacities*: resources and training are needed to enable stakeholders – at different levels of governance- to effectively participate in collaborative management and problem solving through deliberative processes (Armitage *et al.* 2009).

8.2.2 Priority area 2: ArabMAB institutional gaps

Institutional problems have been identified at different levels of BR management and governance in the ArabMAB region. The ArabMAB Network's institutional structure seems to suffer from poor governing bylaws, and membership criteria that require more alignment with the changing needs of the BRs in the area. The reported issue by informal interviewee(s) about appropriation of *ArabMAB memberships and titles* based on academic credentials rather than relevance to the MAB program, has found reciprocity in the in-depth interviews where the issue of "disengaged MAB Focal Points" appeared as a main problem faced by management staff or authorities of several countries. Hence the issue of appropriate selection of BR Focal Points and ArabMAB members is consolidated as an important weakness to be addressed. In parallel, the lack of communication and cooperation (i.e. *Priority area 1*) can be viewed as either a "symptom" or "consequence" of this lack of engagement at the different levels of Arab BRs governance.

When the national MAB authority is disengaged and has limited or no connection to "place" (i.e. BR), it is difficult to build trust and linkages among stakeholders (Armitage *et al.* 2009). As discussed by Armitage and colleagues (2009), the identification of social entities with shared interests is one of the essential conditions for successful ACM, which strengthens the value of tackling this problem effectively within ArabMAB. In order to tackle this issue, the internal bylaws and governing policies of ArabMAB institution need to be updated. If the ArabMAB Network is to thrive in the current context characterized by high uncertainty, complexity and volatility, the internal policy framework governing its functions needs to be transformed to a much more adaptive one (Swanson and Bhadwal 2009). In times when the Arab region is afflicted by a complex wave of conflicts, turning into a rigid and closed system would make it even more vulnerable to external shocks (Holling and Sundstrom 2015). Resilience of the ArabMAB Network will highly depend on the resilience of its governing body (ArabMAB institution), which is currently non-cohesive and characterized by weak linkages. Increasing its resilience will require the initiation and implementation of an adaptive approach, as follows:

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1. <u>Evaluating</u> and recognizing "what is working" and especially "what is not working", in a collaborative and open process of sharing knowledge and experience by stakeholders from the different ArabMAB countries.

2. <u>Re-designing</u> policies and updating bylaws to enable the identification and election of members that share the interests and vision of MAB nationally and internationally; set and align objectives; and plan for evaluation (including appropriate indicator selection) and adjustments as part of the adaptive policy cycle. If policies are to be adaptive, they should incorporate different outcome scenarios and hence be ready for adjustments at the planning stage rather than doing post-hoc adjustments (Section 3.2.2).

3. <u>Implementing</u>, which will require tremendous effort in capacity-building and resource mobilization, appropriate division of responsibilities among stakeholders and organizations, and systematic monitoring of outcomes on the field (Swanson and Bhadwal 2009).

Though establishing an adaptive policy cycle is a long-term process and institutional commitment, short-term initiatives can be taken to start the process and progress toward its long-term adoption in an iterative manner.

8.2.3 Priority area 3: Understanding and differentiation of the BR concept

▪ **Differentiation at the local level**

A lack of differentiation of the BR concept from national PAs has been identified by the study, and was shown to have negative implications on implementation. Indeed in some instances, poor understanding of the concept - in terms of how it differs from other types PAs (i.e. functional zonation)- at inception of the BR and nomination phases was translated into geographically super-imposing the BR territory to existing PA sites (cases of Algeria and Tunisia) (Table 37) without altering the management policies or programs of work. In that instance, the BR designation becomes "obsolete" as it doesn't have any management implications or outcomes attached to it and the BR can be considered a "paper BR". Moreover, the BR authorities find themselves challenged by difficult "zoning alteration" requirements by UNESCO-MAB especially when the PR review process approaches its term and preliminary reflections reveal this discrepancy in implementation (case of Algeria, Table 37).

▪ **Differentiation at the global level**

Secondly, as demonstrated throughout the dissertation, BRs should be differentiated from PAs for a more effective implementation of the MAB vision. However, since BRs encompass

nationally designated PAs (recognized by IUCN categories), collaboration between UNESCO-MAB Secretariat and global PA programs (mainly IUCN's PA program) is of utmost importance to avoid overlapping or counterproductive programs globally. This issue was mentioned as part of an "alignment problem" within countries of the ArabMAB, and is a reflection of a global lack of alignment (Sections 5.1.6, 5.1.7). This differentiation has important policy implications.

In the aim of establishing a "shared vision" and decreasing system inefficiencies as part of post-hoc adjustments (rf. zoning) in Arab BRs nationally and regionally, it is essential to correct and establish a clear understanding of the concept in terms of functional zoning and objectives as compared to national PA designations (that usually concern the core areas). "Shared vision" is identified as one of the essential aspects of ACM (Schultz *et al.* 2011) that contributes to effective BR performance, which adds to the importance of aligning the understanding of BRs among stakeholders. The improvement of communication and linkages (*Priority area 1*) will contribute to resolving this issue by allowing for more dialogue between scientists, governments and organizations, and hence a more effective exchange of information. Moreover, capacity-building and participatory processes at the phase of BR pre-nomination can pre-empt the potential gaps in conceptual understanding and requirements for new/planned BRs. As for existing BRs, learning must be sought in an adaptive approach to "correct" and adjust what has been "dysfunctional" in the system. This assumes the existence of enough interest, political will, as well as resources to increase awareness and operate changes.

8.2.4 Priority area 4: Integration and mainstreaming of the MAB program

Institutional division of BR governance nationally was reported as an issue mostly in Tunisia and Morocco (Section 7.3, Table 37) where different Ministries share some aspects of BR management. The lack of integration has been highlighted as a main problem whereby the different divisions and programs from government institutions do not collaborate enough to align and integrate their programs. Consequently, management effectiveness is negatively affected. More specifically, the integration and mainstreaming of the MAB program into the relevant sectorial programs nationally has been identified as a main priority at different levels (Sections 5.4.1.3, 7.2.2.2):

1. integration and alignment with other conservation and sustainable development programs nationally;
2. integration in the legislative framework of countries;

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3. integration at the level of policy engagements within MLAs for reporting;

4. aligning roles and programs of multiple governance institutions (e.g. Ministry of Environment and Ministry of Agriculture) involved in the management of the BRs, and mainstreaming the MAB program components into the different sectorial strategies that these institutions are responsible for.

Due to the multi-level and shared governance of complex social-ecological systems, "most resources are contested by multiple stakeholders, while management institutions are internally divided" (Armitage *et al.* 2009, 96); which creates an unsupportive environment for effective interventions. This issue - reported at the level of any complex socio-ecological system- finds its echo in the complex governance of BRs (Fig. 6) internationally as well as in the management of Arab BRs. Addressing institutional division and integrating/mainstreaming the MAB components into legislation and sectorial strategies can largely consolidate the MAB program in the Arab region and ensure longer-term sustainability.

8.2.5 Priority area 5: Involvement and participation of local communities

In Phase 2, the low level of local community participation in decision-making identified (Fig.12) finds its parallel in the low level of involvement of local communities and stakeholders (Fig. 19). These results echo the lack of support and ownership by local communities (Tables 37), and the importance of locally adapted involvement of the population (Table 36) identified in Phase 4. The consistency and complementarity of these findings from different phases consolidates and emphasizes the importance of this challenge for the ArabMAB.

"Stakeholder participation in decision-making processes" is an established determining factor of successful BRs (Stoll-Kleemann 2007; Schultz *et al.* 2011), and is intimately related to the development of a "sense of ownership" by all stakeholders. Moreover, participation of local communities promotes essential aspects of ACM implementation including: "shared interests", "common vision", and "trust building" (Armitage *et al*. 2009). The experience of Tunisia whereby the weakened government by revolutions 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. "Centralized bureaucracies are often limited in their ability to respond to rapid social-ecological transformation and to cope with uncertainty" (Armitage *et al*. 2009, 95).

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Hence, countries of the ArabMAB that still rely on centralized approaches of BR governance (e.g. Algeria, Tunisia, Egypt) are highly encouraged to consider innovative strategies that foster participation and co-management. Drawing from the recommendations and evidence to develop and implement a successful adaptive co-management approach (Armitage *et al.* 2009), the following strategies are recommended for the ArabMAB countries concerned:

1. Strong inclusive networks: Developing networks of researchers and experts, community and policy makers that support the BR and participate in decision-making.

2. Decentralization and inclusion of local institutions in governance and decision-making. This will reduce the possibility of competing interests and division and will distribute power in a way that increases local ownership and promotes longer-term sustainability of the BR.

3. Local leadership empowerment through identifying, developing and empowering local leaders who have a strong connection to "place" and can champion processes, as well as act as mediators in conflict resolution. Strong leadership provides a strong asset to BRs governance in Arab countries as it has been shown to partially counteract weak legislative enforcement and corruption through power relations and influence (Section 7.2.2.3).

8.2.6 Priority area 6: Evaluation of biosphere reserve management

"Monitoring and evaluation for adaptive management" ranks 4th of 27 influencing factors of BR success according to 204 BR managers globally (Stoll-Kleemann and Welp 2008). Therefore, improving its effectiveness and implementation would significantly contribute to the success of Arab BRs management.

▪ **The need for BREMi evaluations**

The PR process of evaluation of UNESCO BRs has proven to be ineffective at MEE, as it is designed to focus on assessing the gap between BR concept and implementation rather than management effectiveness. Recent updates in the PR Form (2013) address changes in concept since the beginning of the program and put more emphasis on management and coordination (Section 2.3.6.2) (Table 6); however, updates didn't alter the PR tool's overall purpose. Hence, if used as a management monitoring tool, the PR would have the most commonly reported issue of monitoring programs highlighted by Tucker and colleagues (2005) i.e. the collection of too much data that is not tied to PA (in this case BR) management needs. Hence, as experts also mentioned "it is essential to develop and monitor plans after clearly defining PA management

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objectives" (Margules and Pressey 2000; Tucker 2005; Tucker *et al.* 2005) (Section 2.2.2.2). In that perspective, the BREMi Framework (used as a tool with a scoring system) is a more appropriate tool for appraising management by being designed with a management-focus, and integrating the BR management functions (conservation, development and logistic support) as the standard functions and targeted outcomes of BR concept implementation. If used in combination, the PR and BREMi tools would complement each other for a better evaluation of both concept implementation and management effectiveness.

The ArabMAB experience with PRs and BREMi evaluations provides the first example of the different benefits of using both tools. Based on this research, the PR process in the Arab region was characterized by long periods of submission delay, variable quality of reports that were poor in certain cases, and a low level of understanding or valuing its purpose. In summary, it did not prove to be effective enough in the Arab region to date, and little is known about its effectiveness in specific regions and countries elsewhere (Section 6.4.3). The underlying reasons for poor compliance need to be further defined and addressed. Potential reasons identified in the course of this research include: (1) low level of understanding and/or appreciation of the purpose of the PR, (2) financial limitations and shortage of expertise, and (3) lack of perception and adoption of the PR process as a self-serving learning tool and opportunity by the BR management stakeholders locally (Price *et al.* 2010, Price 2002; Reed and Egunyu 2013). Hence, there is a need to enhance the effectiveness of the PR process, in parallel to using another MEE focused tool (BREMi), in the ArabMAB region, which is in line with an international need to improve monitoring, and report on the PR process and address the obstacles to its effective implementation.

- **How to use the BREMi tool?**
  - A tool for evaluation and learning as part of adaptive management

Used as a tool for evaluation and learning, the BREMi tool fits into the AM approach to BR management by allowing for reflection on the usefulness of certain management decisions and policies and subsequent adaptation of plans and processes in an iterative manner (Fig. 20, *adapted from* Fig. 8).

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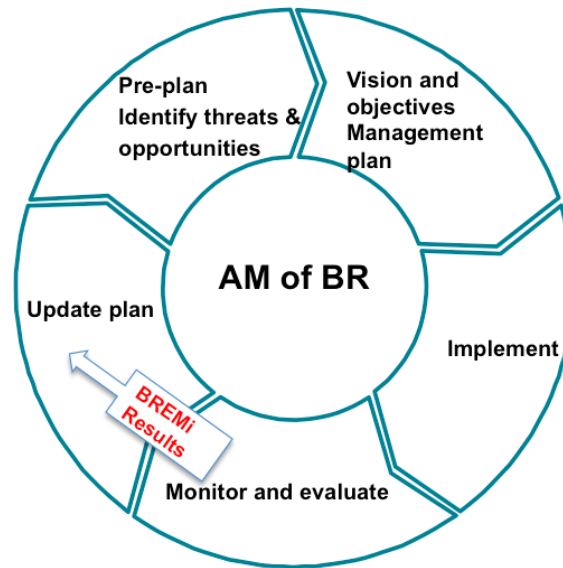
Fig. 20: Chart representing the BREMi evaluation as part of adaptive
management cycle of BR(s)
Note: This cycle represents the first of an iterative process. In subsequent cycles the first 2 steps of
"pre-planning" and "management plan/vision and objectives" become reviews and adjustments

As shown in Fig. 20, the evaluation results will provide input and knowledge to review original decisions, test assumptions and make changes in plans and actions accordingly (and if necessary) (Margules and Pressey 2000; Salafsky *et al.* 2001a; Salafsky *et al.* 2002).

> ➢ <u>A tool for planning as part of adaptive management</u>

Moreover, as stipulated in the adopted definition of AM (Chapter 3),

> *"adaptive management is not simply changing management direction in the face of failed policies; rather, it is a planned approach to reliably learning how to improve policies or management practices over time in the face of uncertainty"* (Bormann *et al.* 2007).

In that perspective, the development and selection of indicators (i.e. BREMi) starts at the (pre-)planning phase. Hence, the BREMi Framework should be adopted by BR managers from the (pre-) planning phase where they should consider necessary adaptation of the tool to their BR's context and management needs i.e. (1) adding/removing relevant/irrelevant indicators, and (2) weighting each of the BHI based on its degree of importance to BR management in their specific context (Anthony and Shestackova 2015; Hockings *et al.* 2015). Thus, the BREMi Framework is also useful as a planning tool as it allows for:

1. Objective and target setting and alignment with indicators.
2. Planning and budgeting for evaluation processes and participatory mechanisms.

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3. Planning for alternative scenarios and for related policy changes in case of failure (Swanson and Bhadwal 2009).

4. Assessing research and knowledge needs, and planning for their access.

5. Identifying and developing policies that create the enabling environment to fulfil objectives, including incentives to BR managers (Armitage *et al.* 2009).

➢ Use of BREMi as part of an adaptive co-management approach

The "evaluation for learning and management" phase is an integral part of the AM process. Its implementation is recommended as part of a collaborative and adaptive management approach, where MEE is conducted using a participatory process fostering discussion around BR management challenges, deliberation and consensus on processes and management decisions. As defined by Selin and Chavez (1995) collaboration involves (1) joint decision-making, (2) power sharing, and (3) collective responsibility of stakeholders for their actions and subsequent outcomes (Section 3.3.1), which also means "risk sharing" of prospective failed policies or outcomes (Armitage *et al.* 2009). Hence, participatory mechanisms at any stage of the AM cycle, including the ones involving the BREMi tool, can increase ownership of the overall MAB program implementation in the Arab region. Thus, involving the local community stakeholders in decision-making about indicators, objectives, outcomes to be monitored etc. is also part of the solution to *Priority area 6*. Inclusive and communal institutional arrangements need to be planned and put in place for a successful and comprehensive participatory evaluation, which in turn needs to be planned in advance i.e. integrated in the institutional design and allocated a budget for.

8.2.7 Priority area 7: Capacity and resources (cross-functional)

Input indicators including a*dequacy of staff numbers*, *adequacy of infrastructure equipment and facilities*, and *security and reliability of funding* have been identified by the research as some of the most deficient aspects of management in the ArabMAB Network. However, as part of developing and/or adopting an ACM approach, structural changes and capacity- building are required (as detailed in most *priority area* Sections above). Hence, "capacity and resources" constitutes a cross-functional need and priority area for the resolution of all other priority areas. Without the appropriate funding, infrastructure and level of expertise (know-how), chances to improve and progress are low. Tackling this issue would require sustainable funding mechanisms, and capacity development.

8.2.7.1 Sustainable funding mechanisms

Recommendations to increase the opportunities of securing sustainable sources of finance include (but are not limited to):

1. Plan for and aim to diversify sources of funding in order to increase sustainability and security of funding, especially in countries where government budget is not sufficient for sustaining the BR management needs (Section 2.4.2.4). Sources of finance to be considered include:

   - International foundations and philanthropies
   - Government aid agencies and embassies
   - Internal sources of revenue from ecotourism, rural development and enterprises
   - Innovative and creative sources of funding through corporate partnerships, philanthropic individuals, fundraising events etc.

2. Seek and develop project partnerships with trans-Mediterranean NGOs or twinning with BRs outside the Arab region for creating common projects that benefit all parties. Projects that involve several partners increase chances of receiving funding from international organizations by increasing accountability and shared responsibility.

3. Sharing experiences between different BRs and learning from existing success stories on sustainable financing.

8.2.7.2 Training, capacity and skills development

Staff numbers and capacities need to be improved and new skills developed in order to increase success of the ACM approach, and overall BR success. This will require:

1. Identification of human resource needs
2. Planning for trainings accordingly and identifying different opportunities for capacity-building and development (national training sessions, congress events, online learning opportunities etc.)
3. Allocating budgets for training at the planning stage

This Section has summarized the main priority areas to be addressed for improving the ArabMAB Network's management performance, and has proposed long-term solutions supported by evidence from the AM and ACM theoretical frameworks. From these envisioned medium/long-term strategies, a series of practical recommendations – some of which are of more short-term applicability- for managing stakeholders and experts have been derived, and are presented below.

8.3 Practical recommendations to main authorities

8.3.1 Recommendations to improve management effectiveness

8.3.1.1 To UNESCO-MAB authorities

Recommendation 1: In order to avoid the problem of "super-imposing" BRs to existing PAs with no differentiation and having "paper BRs" in the future", it is recommended that UNESCO-MAB Secretariat increases awareness and understanding of the BR specificities, management and implementation requirements at the pre-nomination as well as post-nomination[40] stages. Ideally, a pre-nomination workshop can be organized with an expert in BRs who would actively engage national stakeholders (that would be part of the nomination and future implementation) in discussing the implications and requirements of the BR designation. This will ensure a more informed and collaborative decision-making of stakeholders on the appropriateness and willingness to carry the BR designation and its implications on the local community. It will therefore avoid designation and design on an inappropriate basis, and will increase the awareness and involvement of local communities in BR planning and management, hence their motivation to make it successful.

As for existing BRs that still have difficulties with understanding the special characteristics and needs that the designation entails (as compared to PAs), more follow-up will be needed by national UNESCO-MAB authorities to increase their awareness of the concept differentiators. If the improved understanding is not followed by implementation mechanisms that adjust for the needs (e.g. zoning requirements), the retention of the BR designation will have to be reconsidered.

Recommendation 2: Developing specific recommendations and guidelines for the implementation of the BR functional zonation scheme, with a focus on Buffer and Transition zones implementation.

Recommendation 3: Improving visibility and branding locally and regionally through increasing active promotion using media, communication and partnerships with local stakeholders that support the program.

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[40] UNESCO-MAB Secretariat asks authorities and NGOs involved in nominated BR to have a ceremony following the designation aiming at increasing awareness and knowledge about BRs (Ramadan-Jaradi pers.comm.).

8.3.1.2 To ArabMAB authorities

<u>Recommendation 1</u>: Arab Coordinating Council- with the support of MAB regional and international offices- to review its bylaws and membership selection criteria and align them with current needs of BR management identified in this research's findings, and through further direct communication with BR site management team.

<u>Recommendation 2</u>: ArabMAB network to develop regional projects that can be funded by important donors trusting UNESCO reputation. This can strengthen BRs and stimulate the implementation of their objectives and turn highlight/promote the benefits of BRs to stakeholders.

8.3.1.3 To national and local authorities

<u>Recommendation 1</u>: Institutionalizing the MAB program by integrating it into the national legislative framework, aligning it with other conservation programs and mainstreaming it into different sectorial programs.

<u>Recommendation 2</u>: Preparing/Developing the appropriate infrastructure that fosters participatory and collaborative management.

<u>Recommendation 3</u>: Institutionalizing the PR review process and other MEE evaluations (BREMi).

<u>Recommendation 4</u>: Weighting more seriously the long-term costs and benefits of "earning" a BR designation at the pre-nomination phase. This would include discussing the zoning, institutional and resource needs for the long-term sustainability of the program as well as the real foreseen benefits of adding the BR designation to one/many local PAs (that would become parts of the core areas of a BR). This is of more relevance now that the MAB requirements have become more stringent in terms of compliance, which increases the costs and losses in the case of non-compliance.

8.3.2 Recommendations to improve biosphere reserve evaluation

8.3.2.1 To UNESCO-MAB authorities

<u>Recommendation 1</u>: Developing and implementing – with the cooperation of regional offices- a capacity-building program for local experts and/or BR staff on the PR process: objectives, PR Form content and completion requirements.

<u>Recommendation 2</u>: Publishing simple guidelines summarizing important information on the subject to facilitate the process and reduce the financial burden of completing PRs.

Recommendation 3: In response to non-compliant BRs, consider developing a standard response protocol that would provide support mechanisms to facilitate corrective measures and appropriate validation/follow-up[41].

Recommendation 4: Consider integrating interim-reviews - using a tool similar to BREMi- as part of systematic evaluation of management effectiveness in MAB policies. This will help local BRs to anticipate challenges to compliance and adapt their management plans and activities in advance of the PR review.

Recommendation 5: Continue to actively promote a change in the PR evaluation discourse from the "stick and carrot" perception to a "learning mechanism" as already started and highlighted by UNESCO-MAB Secretariat: "The periodic review […] is an effective way of mobilizing and involving key stakeholders […]. It is an opportunity to learn, both for the stakeholders and World Network" (Bouamrane 2007, 5). This will also require the development and integration of appropriate learning mechanisms into the PR Review process (Reed and Egunyu 2013).

8.3.2.2 To ArabMAB authorities

Recommendation 1: Popularize and support the PR evaluation procedure, by channeling capacity-building programs to experts and local staff, and using ArabMAB meetings as opportunities to discuss challenges and solutions of individual BRs in the Arab region.

Recommendation 2: Promote the "evaluation as learning" discourse to the regional network.

Recommendation 3: Provide a platform for exchange of expertise and experience in evaluation.

8.3.2.3 To national and local authorities

Recommendation 1: Adopting the BREMi tool and integrating it into the BR management cycle as part of a standard procedure for self-assessment, reflection, and learning.

Recommendation 2: Continuing to use other social and ecological monitoring tools for more specific assessment of conservation outcomes (including long-term biological monitoring) and social outcomes (i.e. social impact monitoring), in parallel to rapid assessment MEE tools (BREMi).

Recommendation 3: Continuing to adapt BREMi indicators to individual BR needs, and plan to update the evaluation framework based on contextual changes and stakeholder opinions as part of adaptive management.

Recommendation 4: Pro-actively being informed and familiar with the PR Form and processes through public channels such as the MAB-net, and through more mature BR partners that have

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[41] Similar to the approach adopted for World Heritage in Danger sites (UNESCO WHC 2015)

already conducted the process, and trying to allocate budgets (potentially from projects) to its implementation.

The above discussion and devised solutions in addition to the practical recommendations can be considered by other MAB regional networks for improving their management effectiveness while using wise judgment in their applicability to their specific situation and context.

8.4 Original contribution of research

Results of well-conducted regional studies can serve as scientific background information for regional lessons, policy decisions, and for the fulfilment of regional agendas that are embedded in global agendas (Hockings *et al.* 2006; UNESCO 2010). As introduced in Chapter 1 (Fig. 2), the following Section demonstrates how this research brings an original contribution to the literature and to the field of BR management and evaluation. It also discusses indirect contributions to the fields of conservation and sustainable development, which the MAB program is closely tied to.

8.4.1 Academic contribution

The study adds new knowledge to the body of literature by addressing the identified gaps in Section 1.2. It is the first study conducted on ArabMAB management as a regional network, and hence provides a first evaluation of the status of the MAB program in the Arab region. The use of a standard method on a customary type of protected area (BR) allows, for the first time, for a comparison of management status and challenges faced by different countries of the ArabMAB representing very heterogeneous contextual and governance systems. Moreover, the study brings new evidence on the growing discourse of BR assessment as a learning process for AM/ACM, and adds knowledge to this theoretical framework application in high-risk/high uncertainty environments (Chapter 3).

8.4.2 Technical contribution

The research provides the first regional appraisal of the effectiveness of the PR tool and process, the results of which can empower decision-making to improve the PR tool and overall appraisal system of BRs. In addition the novel BREMi framework provides an original set of indicators in 3 different international languages (*Arabic*, *English*, and *French*) developed (Chapter 4, Table 19) based on stockpiled knowledge and lessons learned to date on PAME evaluation tools and BR evaluation. It addresses the gaps of the PR process (Section 4.4.2.5 and Table 20) by:

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- Being designed to appraise gaps in management and identifying areas of improving effectiveness.
- Allowing frequent evaluations as part of an iterative cycle of BR adaptive management, hence addressing the need for assessments within a shorter timescale than the 10-year PR process (refer to *Recommendations for improvement* in Section 2.3.6.2).
- Providing an adapted set of indicators for MEE of BRs in the Arab region.

However, BREMi evaluations are not meant to replace PR evaluations, as they both are tailored to different objectives and measure different things. Hence, they can be used in parallel and with different time scales, but will definitely provide feedback to each other.

Effectively tested in the ArabMAB and proven to identify strengths and weaknesses of management, the BREMi tool can be reviewed and customized to other regions depending on their legislative, social and economic characteristics affecting BR management. Experts can build on this first experience using the new tool to further refine it (e.g. adding a weighting system, reviewing appropriateness of indicators to context), adapt and transfer it to other regions.

The indicator's weighting system used in this research was the most basic, as "indicator importance" was a categorical type of variable allowing for only two answers "yes" or "no". This could have limited the possibilities for respondents to express their opinion about "different levels of importance" of indicators. Therefore, refining the BREMi Framework could benefit from incorporating a numerical weighting scale that would capture different levels of importance, and allow for integrating these levels in the calculation of BREMi scores (Anthony and Shestackova 2015).

It is important to note that like other PAME evaluation tools, BREMi doesn't provide a proxy-evaluation of conservation outcomes, nor social/economic outcomes, and is thus best used in combination with other outcome-specific monitoring tools.

8.4.3 Management and policy contributions

8.4.3.1 Management implications

Biosphere Reserves are complex social-ecological systems with high levels of ecological and social uncertainties. Their managing institutions most often develop - in collaboration with different actors - management plans and action plans without sufficient scientific background

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knowledge to predict outcomes. As the management teams implement these actions, the results are rarely systematically monitored (Stoll-Kleemann *et al.* 2008).

This research provided the first opportunity for individual Arab BRs and for the ArabMAB Network (as a system of BRs) to evaluate their management actions and outcomes and assess their level of effectiveness. As an integral part of their BR management planning cycle (Fig. 8), this *monitoring and evaluation* and its results can hence be utilized to learn, challenge original assumptions at the time when previous plans were designed, and consolidate or amend their management plans. For that aim, results and recommendations from this research will be communicated to BR managers. Moreover, if the BREMi tool is adopted and adapted to each BR's specific needs, it will facilitate the subsequent planning and adaptation of management plans within the AM cycle.

8.4.3.2 Policy implications

▪ **Adaptive policy planning for biosphere reserve management**

At the individual BR level and the level of ArabMAB Network, the developed recommendations inform relevant governance institutions and provide evidence for adaptive policies planning and implementation. As mentioned earlier, adaptive policies are necessary to enable and support the adoption of ACM for improved management success of Arab BRs (local and/or regional scale).

▪ **Compliance with conservation-related multi-lateral agreements**

The research outputs will support reaching MAB objectives in the Arab region, and hence contribute to compliance with the broader conservation-related multilateral agreements, and sustainability agendas that ArabMAB countries are signatory of (Table 10). For example, the BREMi tool, used for evaluation, will support Arab BRs in complying with the CBD, Ramsar and other MLAs evaluation and reporting requirements. However, a more explicit global consensus of policy-makers on "how BRs integrate with other PA systems" will determine how BRs are represented in MLA reports and other PA reporting systems, and what is expected from them in terms of requirements as compared to PAs.

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- **Contribution to sustainable development goals**

The new strategic direction of the WNBR focuses on supporting the implementation and achievement of the new sustainable development goals within the Post-2015 development agenda (Section 2.3.3.4). As stated in its new strategic document

> *"...the MAB and WNBR will work towards the Sustainable Development Goals and contribute to implementing the Post-2015 agenda. This will be done through the implementation of the present Strategy, which includes a series of Strategic Objectives and Strategic Action Areas and an associated Action Plan, to be finalized in 2016."* *(UNESCO 2015a, 3).*

The foreseen contribution of MAB to the SDGs is mainly through scientific research and scientific collaborative networks of relevance to sustainable development knowledge needs and the SDGs (UNESCO 2015a). However, BRs hold the potential of a much larger contribution to the implementation of the new 17 SDGs, particularly Goals 15 and 17 (UN 2015, 14):

> *Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss*

> *Goal 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.*

More specifically, in their mission and capacity to provide "model sites for sustainable development" (UNESCO 2014a), BRs should be considered existing local platforms that can act as relevant *implementation mechanisms*. In that perspective, they can be leveraged for the fulfilment of SDGs especially Goals 15 and 17. If Arab States integrate MAB implementation with SDGs fulfilment, opportunities for aligning the local BR agendas with the global sustainability agenda, and associated planning at the institutional and process levels (e.g. aligning goals and targets, aligning indicators) will be needed. Alignment may happen along common indicators (GEC 2015), further research is required to identify potential common indicators for BRs performance and SDGs.

In conclusion, improving the capacities and management of BRs in the Arab region, will improve their capacity to contribute to the achievement of SDGs and consequently ArabMAB countries' compliance with the new global sustainability agenda.

8.5 Limitations of adaptive co-management in the current ArabMAB context

Although ACM is an approach well "suited to conditions of uncertainty and conflict" (Armitage *et al.* 2009, 95) in order to better address uncertainty and increase resilience of social-ecological systems, its implementation requires an enabling environment (Armitage *et al.* 2009; Fabricius and Currie 2015). This can be achieved through institutional arrangements, leadership, policies and legislation including incentives (Armitage *et al.* 2009; Fabricius and Currie 2015). These in turn are lengthy processes requiring (1) willingness to share power by governing authorities (governments and/or regional or local managers), (2) specific investments of time and resources, (3) lengthy participatory processes that need commitment over time, patience and sometimes compromise in original objectives (Stoll-Kleemann and Welp 2008).

These requirements are challenges that may prove difficult to overcome especially in the context of weak legislative and policy framework and escalating contextual threats in the ArabMAB region. Indeed, as demonstrated in the research, the "policy and legislation framework" constitute a weak aspect of management, while threats (illegal practices, corruption) prevail. If these threats escalate "the urgency of taking action could discourage those involved from undertaking lengthy participatory processes" (Stoll-Kleemann and Welp 2008, 163). In that perspective, the escalating conflicts in the Middle East and North African region could potentially inhibit the successful implementation of ACM for better management of the ArabMAB Network by intensifying legislative weaknesses and shifting priorities to more urgent responses to threats; overall leading to increased vulnerability of BRs as complex socio-ecological systems. Strengthening local leadership and collaboration can partially counteract the lack of legislative and policy support for Arab BRs management, however the balance is vulnerable to high levels of political turmoil, conflicts and accompanying destructive activities.

In contrast to occasional shocks that yield "creative collapses" and foster learning and resilience, certain countries of the ArabMAB region are witnessing frequent shocks that can easily shift BRs to rigidity, closeness and "security seeking", which in turn increases their vulnerability and decreases long-term sustainability (Holling and Sundstrom 2015) (Section 3.1). More research is needed to understand the relevance and limitations of adopting ACM approaches and resilience theory for strengthening PA/BR management in areas with unusual high levels of social and political risk and uncertainty.

8.6 Final thoughts

In the present, depending on the specific situation of each country of the ArabMAB (and potential accompanying level of destructive activities)[42], managers and decision-makers of individual BRs and ArabMAB -as a regional network- will need to use their wise judgment to balance decisions between investing in (1) long-term changes that enable adaptive co-management and improve their resilience to external shocks, and/or (2) more timely solutions that address their shorter-term priority needs (including survival in certain cases) in times of crises, especially given the capacity and resource constraints.

A long history of political turmoil and unrest characterizing the Middle East and North Africa has made populations of the ArabMAB region resilient and adaptive to high levels of uncertainty[43]. Taking the example of Lebanon, dynamic contextual changes and continuous prohibitive levels of uncertainty have driven people to develop creative coping mechanisms and "immunity" to external shocks that allow them to strive and "fight for what they believe in". Nevertheless, the increasing level of political conflicts and their geographic expansion in the Arab region potentially threaten the sustainability of the MAB program especially in the more affected regions. A comprehensive study focusing specifically on this subject is needed to further characterize the status and threats of BRs in high unrest regions, and support planning for their future.

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[42] Characterized by different levels of stability: relatively higher for Gulf countries and currently very low for Syria, Sudan, Yemen.
[43] Applies mostly to the Levant and North Africa region, much less to Gulf countries, which are relatively recent States.

REFERENCES

2010 Biodiversity Indicators Partnership (BIP). 2010. Biodiversity indicators and the 2010 target: Experiences and lessons learnt from the 2010 Biodiversity Indicators Partnership. Montreal: Secretariat of the Convention on Biological Diversity (SCBD).

Anderson, B. 2012. Assessing biodiversity threat mitigation efficacy: A case study of Kakum Conservation Area (2004 to 2012). Master of Science thesis, Central European University, Budapest.

Anthony, B. 2008. Use of modified threat reduction assessments to estimate success of conservation measures within and adjacent to Kruger National Park, South Africa. *Conservation Biology* 22 (6): 1497-1505.

Anthony, B.P., and Matar, D.A. 2012. Protected areas in selected Arab countries of the Levant region (Syria, Lebanon & Jordan): An evaluation of management and recommendations for improvement. In *Topics in Conservation Biology*, ed. T. Povilitis, 1-26. Rijeka, Croatia: InTech Publications.

Anthony, B.P., and Shestackova, E. 2015. Do global indicators of protected area management effectiveness make sense? A case study from Siberia. *Environmental Management* 56 (1): 176-192.

Arab Forum for Environment and Development (AFED). 2008. Arab environment: Future challenges, ed. K. T. Mostafa and N.W. Saab. Beirut: AFED.

--------. 2009. Arab environment: Climate change- impact of climate change on Arab countries, ed. K. T. Mostafa and N.W. Saab. Beirut: AFED.

Armitage, D.R., Plummer, R., Berkes, F., Arthur, R.I., Charles, A.T., Davidson-Hunt I.J., Diduck A.P., Doubleday, N.C., Johnson, D.S., Marschke, M., McConney, P., Pinkerton, E.W., and Wollenberg, E.K. 2009. Adaptive co-management for social–ecological complexity. *Frontiers in Ecology and the Environment* 7 (2): 95–102.

Babbie, E. 1983. The practice of social research. 3rd ed. Belmont, California: Wadsworth Publishing Company.

Batisse, M. 1986. Developing and focusing the biosphere reserve concept. *Nature and Resources* 22 (3): 1–12.

Ben-Nun, P. 2008. Respondent fatigue. In *Encyclopedia of survey research methods*, ed. Paul J. Lavrakas, 743-744. Thousand Oaks, CA: Sage Publications Inc.

Berg, B. L. 1989. *Qualitative research methods for the social sciences*. New York: Allyn and Bacon.

Bertzky, B., Corrigan, C., Kemsey, J., Kenney S., Ravilious, C., Besançon, C., and Burgess, N. 2012. *Protected planet report 2012: Tracking progress towards global targets for protected areas*. Gland, Switzerland, and Cambridge, UK: IUCN and UNEP-WCMC.

Bioret, F., Cibien, C., Genot, J.-C., and Lecomte, J. 1998. A guide to biosphere reserve management: A methodology applied to French biosphere reserves. MAB Digest 19. Paris: UNESCO.

Bormann, B.T., Haynes, R.W., and Martin, J.R. 2007. Adaptive management of forest ecosystems: Did some rubber hit the road? *BioScience* 57 (2):186-191.

Bouamrane, M. (ed.). 2007. Dialogue in biosphere reserves: references, practices and experiences. Biosphere reserves – Technical Notes 2. Paris: UNESCO.

Bradley, G.W. 1978. Self-serving biases in the attribution process: A reexamination of the fact or fiction question. *Journal of Personality and Social Psychology* 36(1): 56-71.

Brandon, K., Sanderson, S., and Redford, K. (ed.). 1998. *Parks in peril: people, politics, and protected areas*. Washington D.C.: The Nature Conservancy Island Press.

Bridgewater, P., Philipps, A., Green, M., and B. Amos. 1996. *Biosphere reserves and the IUCN system of protected area management categories*. Canberra: Australian Nature Conservation Agency, the World Conservation Union and the UNECO-MAB Programme.

Bruner, G., Gullison, R., Rice, R., and da Fonseca, G. 2001. Effectiveness of parks in protecting tropical biodiversity. *Science* 291: 125-128.

Burnard P. 1991. A method of analysing interview transcripts in qualitative research. *Nurse Education Today* 11: 461-466.

Carranza, T., Manica, A., Kapos, V., and Balmford, A. 2014. Mismatches between conservation outcomes and management evaluation in protected areas: A case study in the Brazilian Cerrado. *Biological Conservation* 173: 10-16.

Central European University (CEU). 2015. *Ethical research policy*. Official document. URL: http://documents.ceu.edu/documents/p-1012-1v1505 [consulted October 2015].

Central Intelligence Agency (CIA). 2015. The World Factbook. URL: https://www.cia.gov/library/publications/the-world-factbook/ [consulted September 2015].

Centre for Disease Control (CDC). 2009. Data collection methods for evaluation: document review. *Evaluation Briefs* (18). Atlanta: CDC. URL: http://www.cdc.gov/healthyyouth/evaluation/pdf/brief18.pdf

Conservation Measures Partnership (CMP). 2007. *Open standards for the practice of conservation, version 2.0*. URL: http://www.conservationmeasures.org/wp-content/uploads/2010/04/CMP_Open_Standards_Version_2.0.pdf [consulted October 2012].

Convention on Biological Diversity (CBD). 2012. Aichi biodiversity targets. CBD Secretariat official website. URL: https://www.cbd.int/sp/targets/[consulted October 2012].

--------. 2010. Conference of the Parties (COP) 10, Decision X/31: Protected areas. CBD Secretariat official website. URL: http://www.cbd.int/decision/cop/?id=12297 [consulted March 2015].

--------. 2015. Protected areas and the CBD. CBD Secretariat official website. URL: http://www.cbd.int/protected/pacbd/[consulted April 2015].

Cook, C.N., and Hockings, C. 2011. Opportunities for improving the rigor of management effectiveness evaluations in protected areas. *Conservation Letters* 4 (5): 372-382.

Dudley, N. 2012. Biosphere reserves in Viet Nam: With recommendations to UNESCO. Internal document. Paris: UNESCO.

Dudley, N. (ed.). 2008. Guidelines for applying protected areas management categories. Gland, Switzerland: IUCN.

Dudley, N. (ed.). 2013. Guidelines for applying protected areas management categories. Gland, Switzerland: IUCN.

El Masry, R., Zreik, R., Al-Droubi, A., Al-Zubari, W.K., Asfari, A.F., Abido, M.S., Al-Jenaid, S., El-Kholei, A.O., Al-Ajmi, D., Ramadan, A., Abahussain, A.A., Abdo, A.S.A. Soussi, N., Ahmed, M.T., Tell, S. 2010. Environment Outlook for the Arab Region (EOAR): Environment for development and human well-being. The EOAR was prepared by United Nations Environment Program (UNEP), League of Arab States (LAS), and Centre for Environment and Development for the Arab Region and Europe (CEDARE). Bahrain: UNEP.

Elzinga, C.L., Salzer, D.W., Willoughby, J.W., and Gibbs, J.P. 2001. *Monitoring plant and animal populations*. Abingdon, UK: Blackwell Scientific Publications.

Ervin, J. 2003. Rapid Assessment and Prioritization of Protected Area Management (RAPPAM). Gland, Switzerland: WWF International.

EuroMAB. 2013. Biosphere reserves as "sites of excellence". Presented at EuroMAB 2013 conference held in Brockville, Canada on October 17, 2013.URL: http://www.frontenacarchbiosphere.ca/sites/frontenacarchbiosphere.ca/files/img/BRs as sites of excellence.pdf [consulted April 2015].

Fabricius, C., and Currie, B. 2015. Adaptive management, a personal history. In *Adaptive management of social-ecological systems,* ed. C.R. Allen, and A.S. Garmestani, 147-180. Heidelberg, New York, London: Springer Dordrecht. (E-Book) Available at: https://mail.google.com/mail/u/0/ - search/resource/14f764ac98eb666e?projector=1

Field, P. A., and Morse, J. M. 1985. *Nursing research: The application of qualitative approaches*. Croom Helm, London.

Fox, D. J. 1982. *Fundamentals of research in nursing*. 4th ed. New York: Appleton-Century-Crofts.

Ganbaatar, A. 2011. Influence of tourism in protected areas: case of KharUs NuurNational Park, Mongolia. Master of Science thesis, Central European University, Budapest.

Gari, L. 2006. A history of the Himā conservation system. *Environment and History* 12: 213-28.

Garmestani, A. S., and Allen, C.R. 2014. *Social-ecological resilience and law*. New York: Columbia University Press.

Garmestani, A.S., and Allen, C.R. 2015. Adaptive management of social-ecological systems: The path forward. In *Adaptive management of social-ecological systems,* ed. C.R. Allen, and A.S. Garmestani, 255-262. Heidelberg, New York, London: Springer Dordrecht. (E-Book) Available at: https://mail.google.com/mail/u/0/ - search/resource/14f764ac98eb666e?projector=1

Glaser, B.G., and Strauss, A.L. 1967. *The discovery of grounded theory*. Chicago: Aldine.

The Green Economy Coalition (GEC). 2015. Monitoring for sustainable development: The need for alignment. Measure What Matters, Background paper: 3. Draft (May 2015). URL: http://measurewhatmatters.info/wp-content/uploads/2015/07/MWM-IRF-Retreat-7.-Monitoring-for-Sustainable-Development-The-Need-for-Alignment.pdf [consulted October 2015].

Hanson, T., Brooks, T.M., da Fonseca, G.A.B., Hoffmann, M., Lameroux, J.F., Machlis, G., Mittermeier, C.G., Mittermeier, R.A., and Pilgrim, J.D. 2009. Warfare in biodiversity hotspots. *Conservation Biology* 23 (3): 578-587.

Hockings, M. 2003. Systems for assessing the effectiveness of management in protected areas. *BioScience* 53 (9): 823-832.

Hockings, M., Leverington, F., and Cook, C. 2015. Protected area management Effectiveness. In *Protected area governance and management*, ed. G.L.Worboys, M. Lockwood, A. Kothari, S. Feary and I. Pulsford, 889–928. Canberra: ANU Press.

Hockings, M., Robyn, M., Stolton, S., Dudley N., Mathur, V., Makombo, J., Courrau, J., and Parrish, J. 2008. Enhancing our heritage toolkit: Assessing management effectiveness of natural World Heritage sites. Paris: UNESCO World Heritage Centre. Available at: http://whc.unesco.org/en/series/23/

Hockings, M., Stolton, S., and Dudley, N. 2000. *Evaluating effectiveness: a framework for assessing the management of protected areas*. Gland, Switzerland and Cambridge, UK: IUCN.

Hockings, M., Stolton, S., and Dudley, N. 2004. Management effectiveness: assessing management of protected areas? *Journal of Environmental Policy & Planning* (6) 2: 157-174.

Hockings, M., Stolton, S., Leverington, F., Dudley, N., and Courrau, J. 2006. Evaluating effectiveness: a framework for assessing management effectiveness of protected areas. *Best Practice Protected Areas Guidelines* (14), 2nd ed. Gland, Switzerland and Cambridge, UK: IUCN.

Holling, C.S. (ed.). 1978. *Adaptive environmental assessment and management*. New York: John Wiley and Sons.

Holling, C.S., and Sundstrom, S.M. 2015. Adaptive management, a personal history. In *Adaptive management of social-ecological systems*, (E-Book), ed. C.R. Allen, and A.S. Garmestani, 11-26. Heidelberg, New York, London: Springer Dordrecht.

Ishwaran, N., and Persic, A. 2008. Concept and practice: the case of UNESCO biosphere reserves. *Int. J. Environment and Sustainable Development* 7 (2): 118-131.

IUCN. 1987. Buffer zones: development that protects parks. *IUCN Bulletin* 18: 10-11.

---------.1995. Evaluation of the implementation of the 1984 action plan for biosphere reserves. Paris: UNESCO.

-------. 1994. Guidelines for protected areas management categories. Gland, Switzerland and Cambridge, UK: Commission on National Parks and Protected Areas (CNPPA) with assistance from World Conservation Monitoring Centre, IUCN.

--------. 2005. The Durban action plan. Revised version (2004). URL: http://cmsdata.iucn.org/downloads/durbanactionen.pdf [consulted January 2012].

--------. 2015. Red list of endangered species. URL: www.iucnredlist.org [consulted April 2015].

IUCN-Mediterranean (IUCN-Med). 2012. *Programme de renforcement des capacités pour la gestion et la gouvernance des réserves de biosphère en Afrique du Nord* [Capacity-building programme for the management and governance of biosphere reserves in North Africa]. Malaga, Spain: IUCN-Med.

IUCN and UNEP-WCMC. 2009. The World Database on Protected Areas (WDPA). Cambridge: UNEP-WCMC. URL: www.wdpa.org (version no longer available) [consulted December 2011].

--------. 2012. The World Database on Protected Areas (WDPA). Cambridge, UK: UNEP-WCMC. URL: http://www.protectedplanet.net [consulted September 2012].

--------. 2015. The World Database on Protected Areas (WDPA). Cambridge, UK: UNEP-WCMC. URL: http://www.protectedplanet.net [consulted April 2015]

IUCN-World Commission on Protected Areas (WCPA). 2009. WCPA Science and management strategic direction: Management effectiveness as a priority. URL: http://www.iucn.org/about/union/commissions/wcpa/wcpa_work/wcpa_strategic/wcpa_science/[consulted February 2012].

Jacobson, C., Hughey, K.F.D., Allen, W.J., Rixecker, S., and Carter, R.W. 2009. Toward more reflexive use of adaptive management. *Society and Natural Resources* 22: 484-495.

Juffe-Bignoli, D., Burgess, N.D., Bingham, H., Belle, E.M.S., de Lima, M.G., Deguignet, M., Bertzky, B., Milam, A.N., Martinez-Lopez, J., Lewis, E., Eassom, A., Wicander, S., Geldmann, J., van Soesbergen, A., Arnell, A.P., O'Connor, B., Park, S., Shi, Y.N., Danks, F.S., MacSharry, B., and Kingston, N. 2014. Protected Planet Report 2014. Cambridge, UK: UNEP-WCMC.

Kates, R.W., Parris, T.M., and Leiserowitz, A.A. 2005. What is sustainable development? Goals, indicators, values and practice. *Environment: Science and Policy for Sustainable Development* 47 (3): 8–21.

Kline, J.B.T. 2005. Classical test theory: Assumptions, equations, limitations and item analyses. In *Psychological testing: A practical approach to design and evaluation,* 91-106. Thousand Oaks, CA: Sage Publications Inc.

Kovalenko, O. 2012. Setting the priorities for threat reduction management in protected areas in Ukraine. Master of Science thesis, Central European University, Budapest.

Lee, K. 1993. Compass and gyroscope: integrating science and politics for the environment. Washington D.C.: Island Press.

Leverington, F., Costa, K.L., Courrau, J., Pavese, H., Nolte, C., Marr, M., Coad, L., Burgess, N., Bomhard, B., and Hockings, M. 2010a. *Management effectiveness evaluation in protected areas – a global study.* 2nd ed. Brisban, Australia: The University of Queensland.

Leverington, F., Costa, K.L., Pavese, H., Lisle, A., and Hockings, M. 2010b. A global analysis of protected area management effectiveness. *Environmental Management* 46: 685-698.

Leverington, F., Hockings, M., Pavese, H., Costa, K.L., and Courrau, J. 2008. Management effectiveness evaluation in protected areas – a global study. Supplementary Report No. 1: Overview of approaches and methodologies. Gatton, Australia: The University of Queensland, The Nature Conservancy, WWF, and IUCN-WCPA.

Lotze-Campen, H., Reusswig, F., and Stoll-Kleemann, S. 2008. Integrated socio-ecological monitoring of biodiversity change - building upon the World Network of biosphere reserves. *GAIA* 17 (1): 107-115.

MacKinnon, J., MacKinnon, K., Child, G., and Thorsell, J. 1986. *Managing protected areas in the tropics.* Cambridge, UK: IUCN.

Margoluis, R., and Salafsky, N. 2001. *Is our project succeeding? A guide to threat reduction assessment for conservation.* Washington D.C.: Biodiversity Support Program.

Margules, C.R., and Pressey R.L. 2000. Systematic conservation planning. *Nature* 405 (May): 243-253.

Matar, D. 2009. New insights into monitoring protected area management in Lebanon. Master of Science thesis, Central European University, Budapest.

Matar, D.A. and Anthony, B.P. 2010. Application of modified threat reduction assessments in Lebanon. *Conservation Biology* 24 (5): 1174–1181.

Medema, W., McIntosh, B.S., and Jeffrey, P.J. 2008. From premise to practice: A critical assessment of integrated water resources management and adaptive management approaches in the water sector. *Ecology and Society* 13 (2): 29.

Miller, D.T., and Ross., M. 1975. Self-serving biases in the attribution of causality: Fact or fiction? *Psychological Bulletin* 82 (2): 213–225.

Mirkin, B. 2010. Population levels, trends and policies in the Arab region: Challenges and opportunities. *Arab Human Development Report Research Paper Serie*s. Cairo: United Nations Development Programme (UNDP), Regional Bureau for Arab States.

Nolte, C., and Agrawal, A. 2013. Linking management effectiveness indicators to observed effects of protected areas on fire occurrence in the Amazon rainforest. *Conservation Biology* 27 (1): 155–165.

Nolte, C., Agrawal, A., and Barreto, P. 2013. Setting priorities to avoid deforestation in Amazon protected areas: are we choosing the right indicators? *Environmental Research Letters* 8 015039 (p 7).

Nolte, C., Leverington, F., Kettner, A., Marr, M., Neilsen, G., Bomhard, B., Stolton, S., Stoll-Kleemann, S., and Hockings, M. 2010. Protected area management effectiveness assessments in Europe. A review of application, methods and results. Bonn, Germany: Federal Ministry of the Environment, Nature Conservation and Nuclear Safety.

Osipova, E., Shi, Y., Kormos, C., Shadie, P., Zwahlen. C., and Badman, T. 2014. IUCN World Heritage Outlook 2014: A conservation assessment of all natural World Heritage sites. Gland, Switzerland: IUCN. Available at: https://portals.iucn.org/library/efiles/documents/2014-039.pdf

Papp, C.-R. 2011. Tracking management effectiveness: Experiences from two Carpathian biosphere reserves. In *Biosphere* reserve*s in the mountains of the world: Excellence in the clouds,* 112-116. Vienna, Austria: Austrian Academy of Sciences Press.

Persha, L., and Rodgers, A. 2002. Threat reduction assessment in the UNDP-GEF East African cross borders biodiversity project: Experience with a New ICD Monitoring Tool. *ArcJournal* (14) (August).

Price, M.F. 2002. The periodic review of biosphere reserves: A mechanism to foster sites of excellence for conservation and sustainable development. *Environmental Science & Policy* 5: 13-18.

Price, M.F., Park, J.J. and Bouamrane, M. 2010. Reporting progress on internationally-designated sites: The periodic review of biosphere reserves. *Environmental Science & Policy* 8: 549-557.

Ramsar Convention. 2015. Country profiles. Gland: The Ramsar Convention Secretariat. URL: http://www.ramsar.org/country-profiles [consulted April 2015].

Reed, M.G., and Egunyu, F. 2013. Management effectiveness in UNESCO biosphere reserves: Learning from Canadian periodic reviews. *Environmental Science & Policy* 25: 107-117.

Royal Society for the Conservation of Nature (RSCN). 2008. Funders and supporters. URL: http://www.rscn.org.jo/orgsite/RSCN/AboutRSCN/Milestones/FundersSupporters/tabi d/74/Default.aspx [consulted April 2014].

--------. 2014. Jordan protected areas: management effectiveness. National report. Amman: RSCN.

Salafsky, N., Cauley, H., Balachander, G., Cordes, B., Parks, J., C., Bhatt, S., Encarnacion, C., Russell, D., and Margoluis, R. 2001a. A systematic test of an enterprise strategy for community-based biodiversity conservation. *Conservation Biology* 15: 1585-1595.

Salafsky, N., Margoluis, R., and Redford, K.H. 2001b. *Adaptive management: A tool for conservation practitioners*. Washington, D.C.: Biodiversity Support Program.

Salafsky, N., and Margoluis, R. 1999. Threat reduction assessment: a practical and cost effective approach to evaluating conservation and development projects. *Conservation Biology* 13: 830-841.

Salafsky, N., Margoluis R., Redford, K.H., and Robinson, J.B. 2002. Improving the practice of conservation: a conceptual framework and research agenda for conservation science. *Conservation Biology* 16: 1469-1479.

Schliep, R., and Stoll-Kleemann, S. 2010. Assessing governance of biosphere reserves in Central Europe. *Land Use Policy* 27 (3): 917-927.

Schultz, L., Duit, A., and Folke, C. 2011. Participation, adaptive co-management, and management performance in the world network of biosphere reserves. *World Development* 39 (4): 662–671.

Secretariat of the Convention on Biological Diversity (SCBD). 2009. Protected areas. URL: http://www.cbd.int/protected [consulted November 2011].

Selin, S., and Chavez, D. 1995. Developing a collaborative model for environmental planning and management. *Environmental Management* 19 (2): 189-195.

Shapiro, S.S., and Wilk, M.B. 1965. An analysis of variance test for normality (complete samples). *Biometrika* 52 (3-4): 591-611.

Smokey, A. 2000. An introduction to the Arab world: stereotypes, misconceptions, and what is the Arab League? URL: http://www.ardisson.org/smokey/mal/intro.pdf [consulted April 2012].

Society for the Protection of Nature in Lebanon (SPNL). 2010. *The involvement of local conservation groups in IBAs conservation in the Himas of Lebanon*. URL: http://www.birdlife.org/sites/default/files/attachments/Review-of-LCGs-in-LEBANON_Final.pdf [consulted April 2012].

Stoll-Kleemann, S. 2005. Indicators and evaluation of sustainable natural resource management and governance in biosphere reserves. In *Global Change Impact in Mountain Biosphere Reserves*, 237-245. Paris, France: UNESCO.

--------. 2007. Success factors for biosphere reserve management. *UNESCO Today, Journal of the German Commission for UNESCO* (2). Germany: German Commission for UNESCO.

--------. 2010. Evaluation of management effectiveness in protected areas: Methodologies and results. *Basic and Applied Ecology* 11 (5): 377-382.

Stoll-Kleemann, S., Bertzky, M., de la Vega-Leinert, A.C., Fritz-Vietta, N., Leiner, N., Hirschnitz-Garbers, M., Mehring, M., Reinhold, T., and Schliep, R. 2008. The Governance of Biodiversity (GoBi) project. *A Vision For Protected Area Management And Governance*, 24. Wolgast, Germany: Hoffmann-Druck GmbH.

Stoll-Kleemann, S., de la Vega-Leinert A.C., and Schultz, L. 2010. The role of community participation in the effectiveness of UNESCO biosphere reserve management: evidence and reflections from two parallel global surveys. *Environmental Conservation* 37 (3): 227-238.

Stoll-Kleemann, S., and Welp, M. 2008. Participatory and integrated management of biosphere reserves: Lessons from case-studies and a global survey. *GAIA* 17 (1): 161-168.

Stolton S., Hockings M., Dudley, N., MacKinnon, K., Whitten, T., and Leverington, F. 2003. Reporting progress in protected areas: A simple site-level management effectiveness tracking tool. Gland, Switzerland: World Bank-WWF Alliance for Forest Conservation and Sustainable Use.

Swanson, D.A., and Bhadwal, S. (ed.). 2009. Creating adaptive policies: A guide for policy-making in an uncertain world. *Canada: Sage Publications, International Development Research Centre (IDRC).* Available online at: http://www.crdi.ca/EN/Resources/Publications/openebooks/467-3/index.html

Talhouk, N.S., and Abboud, M. 2009. Impact of climate change: Vulnerability and adaptation-ecosystems and biodiversity. In *Arab environment: Climate change - impact of climate change on Arab countries,* ed. K. T. Mostafa and N.W. Saab, 101-112. Beirut, Lebanon: AFED.

Tashakkori, A., and Teddlie, C. 2003. *Handbook of mixed methods in social and behavioral research*. California: Sage Publications.

Tucker, G. 2005. *A review of biodiversity conservation performance measures*. Oxford, United Kingdom: Earthwatch Institute.

Tucker, G., Bubb, P., de Heer, M., Miles L., Lawrence, A., Bajracharaya, S.B., Nepal, R.C., Sherchan, R., and Chapagain, N.R. 2005. *Guidelines for biodiversity assessment and monitoring for protected areas*. Kathmandu, Nepal: KMTNC.

United Nations (UN). 2015. Draft outcome document of the United Nations summit for the adoption of the post-2015 development agenda. Sixty-ninth session, Agenda items 13 (a) and 115 (12 August 2015). URL: http://www.un.org/ga/search/view_doc.asp?symbol=A/69/L.85&Lang=E [consulted September 2015].

United Nations Development Program (UNDP). 2014. The human development report. URL: http://www.undp.org/content/undp/en/home/librarypage/hdr/2014-human-development-report/ [consulted April 2015].

United Nations Environment Programme (UNEP). 2006. Conference of the Parties on the Convention for Biological Diversity. Eighth meeting held in Curitiba, Brazil, 20-31 March 2006: Item 27.1 of the provisional agenda. Review of the implementation of the programme of work on protected areas for the period 2004-2006. URL: http://www.cbd.int/doc/meetings/cop/cop-08/official/cop-08-29-en.pdf [consulted October 2011].

United Nations Educational Scientific and Cultural Organization (UNESCO). 1984. Action plan for biosphere reserves. *Nature and Resources* 20 (4): 1-12.

--------. 1996. Biosphere reserves: The Seville Strategy and the Statutory Framework of the World Network. Paris, France: UNESCO.

--------. 1997. Proceedings of the workshop on the Arab-MAB network of biosphere reserves: Damascus, Syria, 2-5 December 1996. Cairo: UNESCO Cairo Office.

--------. 1998. Arab Network of Man and Biosphere Programme. Cairo: UNESCO Cairo Office.

--------. 2008. Madrid Action Plan for biosphere reserves (2008-2013). Paris, France: UNESCO.

--------. 2009. International Coordinating Council of the Man and the Biosphere (MAB) Programme, twenty-first session, Item 8 of the Provisional Agenda: Periodic review of biosphere reserves. Final Report. URL: http://www.unesco.org/mab/doc/icc/2009/e_periodicRev.pdf [consulted February 2015].

--------. 2010. Lessons from biosphere reserves in the Asia-Pacific region, and a way forward. A regional review of biosphere reserves in Asia & the Pacific to achieve sustainable development. Jakarta: UNESCO Regional Office. URL: http://unesdoc.unesco.org/images/0018/001883/188345e.pdf [consulted January 2012].

--------. 2011. International Coordinating Council of the Man and Biosphere (MAB) programme: twenty-third session, Item 9 of the Provisional Agenda: a) Periodic review of biosphere reserves. URL: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/SC-11-CONF-202-7_E_Periodic_Review_of_BRs.pdf[consulted November 2012].

--------. 2013. Periodic Review for Biosphere Reserve. http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/Periodic_review_form_english_2013.pdf[consulted December 2014].

--------. 2014a. MAB official website. URL: http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/man-and-biosphere-programme/ [consulted April 2015].

--------. 2014b. Biosphere reserves which have provided PR reports examined by the MAB ICC as of June 2014. URL: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/Periodic_review_BR_june_2014_v2_en.pdf [consulted February 2015].

--------. 2014c. Biosphere reserves withdrawn from the World Network of Biosphere Reserves (2014). URL: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/BRs_withdrawn_2014.pdf [consulted February 2015].

--------. 2014d. Final evaluation of the Madrid Action Plan for biosphere reserves. URL: http://unesdoc.unesco.org/images/0022/002280/228056E.pdf [consulted February 2015].

--------. 2014e. International Co-ordinating Council of the Man and the Biosphere (MAB) Programme: twenty-sixth session, Sweden 10-13 June 2014. Final Report. URL: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/SC14-CONF-226-15-MAB-ICC_Final_Report_en_8-7-2014-v2.pdf [consulted February 2015].

--------. 2014f. International Co-ordinating Council of the Man and the Biosphere (MAB) Programme , twenty-sixth session, Item 11 of the provisional agenda: Update on the Exit Strategy. URL: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/SC-14-CONF-226-9_exit_strategy_en_01.pdf [consulted February 2015].

--------. 2015a. MAB strategy 2015-2025: Final draft 4 May 2015. URL: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/Final_Draft_MAB_Strategy_4-5-15_en.pdf [consulted September 2015].

--------. 2015b. MAB official website. URL: http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/man-and-biosphere-programme/ [consulted October 2015].

UNESCO World Heritage Center (WHC). World Heritage in Danger. 2015. URL: http://whc.unesco.org/en/danger/ [consulted September 2015].

United Nations Economic and Social Commission for Western Asia (UNESCWA). 2009. The demographic profile of the Arab countries. URL: http://www.escwa.un.org/information/publications/edit/upload/sdd-09-TP9.pdf [consulted October 2012].

--------. 2010. The third Arab report on the millennium development goals 2010 and the impact of the global economic crisis. New York: UN.

United Nations University Institute for Water, Environment and Health (UNU-INWEH). 2014. Human Integrated Management Approach (HIMA). URL: http://inweh.unu.edu/hima/ [consulted September 2014].

Van Wilgen, B.W., and Biggs, H.C. 2011. A critical assessment of adaptive ecosystem management in a large savanna protected area in South Africa. *Biological Conservation* 144: 1179-1187.

de Vaus, D. 2002. Surveys in social research. 5th ed. London: Routledge.

Walters, C.J. 1986. *Adaptive management of renewable resources*. New York: Mc Graw Hill.

Whelan, R.J. 2004. Adaptive management: what does it mean and how can it be used in fire management? ed. S. Halse. In *Bushfire: Managing the risk*. Sydney, Australia: New South Wales Nature Conservation Council.

W.K. Kellogg Foundation. 1998. *Evaluation handbook.* Michigan: W.K. Kellogg Foundation. URL: http://www.wkkf.org/Pubs/Tools/Evaluation/Pub770.pdf

World Wide Fund for Nature (WWF). 2007. Management effectiveness tracking tool: Reporting progress at protected area sites. 2nd ed. Gland, Switzerland: WWF International.

Zimsky, M., Cavelier, J., Ferraro, P., Joshi, A., Krishnan, P., Mee, J., Sekhran, N. 2012. Results of the GEF biodiversity portfolio monitoring and learning review mission, India: Enhancing outcomes and impact through improved understanding of protected area management effectiveness. GEF Report 6/4/2012. Washington: Global Environmental Facility.

Personal communication:

Algeria Representative (Anonymous). Formal interview. World Parks Congress, Sydney, 2014.

Egypt Representative (Anonymous). Formal interview. World Parks Congress, Sydney, 2014.

Mahjoub, Maher. North Africa Programme Coordinator, IUCN Mediterranean Cooperation Center. Skype communication. Budapest-Malaga, 2012.

Morocco Representative (Anonymous). Formal interview. World Parks Congress, Sydney, 2014.

Ramadan-Jaradi, Ghassan. Professor of eco-ornithology, Lebanese University. Member of the MAB-UNESCO International Advisory Committee. Member of ArabMAB Bureau. Email communication. Budapest-Beirut, 2012-2015.

Tunisia Representative 1 (Anonymous). Informal communication. World Parks Congress, Sydney, 2014.

Tunisia Representative 2 (Anonymous). Informal communication. World Parks Congress, Sydney, 2014.

APPENDICES

Appendix 1: Periodic review report forms

Note: The Forms have been reformatted to fit the Dissertation (space allocated for answers has been altered from originals).

Appendix 1.1: Old periodic review form (1996-2013): 2002 version

PERIODIC REVIEW
FOR BIOSPHERE RESERVES
(January 2002)

The UNESCO General Conference, at its 28th session, adopted Resolution 28 C/2.4 on the *Statutory Framework of the World Network of Biosphere Reserves*. This text defines in particular the *criteria for an area to be qualified for designation as a biosphere reserve* (Article 4). In addition, Article 9 foresees a periodic review 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.* The text of the Statutory Framework is given in the annex. The form which follows is proposed to help States to prepare their national reports in accordance with Article 9 and to update the data available to the Secretariat on the biosphere reserves concerned. This report should enable the International Coordinating Council (ICC) of the MAB Programme to review how each biosphere reserve is fulfilling the criteria of Article 4 of the Statutory Framework and in particular the three functions. It should be noted that it is requested, in the last part of the form *(Conclusion),* to indicate the way in which the biosphere reserves fulfils each of these criteria.

It is advisable to quantify data as much as possible and to provide supporting documentation to complete the information provided, especially:

➤ a map clearly showing the zonation;

➤ the legal texts for the different zones.

The completed form should be sent to:

UNESCO
Division of Ecological and Earth Sciences
1, rue Miollis
F-75732 Paris Cedex 15, France
Tel: +33.1.45.68.40.67
Fax: +33.1.45.68.58.04
E-mail: mab@unesco.org

I. NAME OF THE BIOSPHERE RESERVE

…………………………………………………………………………………………..

II. COUNTRY

…………………………………………………………………………………………..

III. PHYSICAL CHARACTERISTICS OF THE BIOSPHERE RESERVE

Latitude and longitude

…………………………………………………………………………………………..

Please enclose a map showing the general location of the biosphere reserve.

Biogeographical Region

Indicate the name usually given to the biogeographical region in which the biosphere reserve is situated.

…………………………………………………………………………………………..

Topography of the region

Briefly describe the major topographic features (wetlands, marshes, mountain ranges, dunes, landscapes, etc.).

…………………………………………………………………………………………..
…………………………………………………………………………………………..

Climate

Briefly describe the climate of the area using one of the common climate classifications.

…………………………………………………………………………………………..

Geology, geomorphology, soils

Briefly describe the main land formations and characteristics.

…………………………………………………………………………………………..

Significance for conservation of biological diversity: habitats and characteristic

Species. *List main habitat types (e.g. humid tropical forest, savanna woodland, alpine tundra, coral reef, seagrass beds) and land cover (e.g. residential areas, agricultural land,*

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grazing land).

Type of habitat:

Main species:

……………………………………………………………………………………..

Main human impacts:

……………………………………………………………………………………..

Relevant habitat management practices:

……………………………………………………………………………………..

Habitats of special interest:

Describe and indicate the location of habitats which are unique or exceptionally important from the point of view of conservation.

……………………………………………………………………………………..

Endangered or threatened plant or animal species:

Identify species (with scientific names) or groups of species of particular interest for conservation, in particular if they are threatened with extinction.

……………………………………………………………………………………..

Species of traditional or commercial importance:

Indicate the use(s) of these species or varieties.

……………………………………………………………………………………..

IV. ZONATION

Names of the different areas

Indicate the names of the different areas which make up the core area(s) and buffer zone(s).

……………………………………………………………………………………..

Spatial configuration

A Biosphere Reserve Zonation map showing the delimitations of all core area(s) and buffer zone(s) must be provided. Also indicate the approximate extent of the transition area(s).

Size of terrestrial Core Area(s): ……………… ha.

If appropriate, size of marine Core Area(s): ……………… ha.

Size of terrestrial Buffer Zone(s): ……………… ha.

If appropriate, size of marine Buffer Zone(s): ……………… ha.

Approx. size of terrestrial Transition Area(s) (if applicable): ……………… ha.

If appropriate, approx. size of marine Transition Area(s): ……………… ha.

Brief justification of this zonation (in terms of the various roles of biosphere reserves) as it appears on the zonation map.

……………………………………………………………………………………………..

V. HUMAN ACTIVITIES

Population living in the reserve

Approximate number of people living within the Biosphere Reserve.

Permanently / Seasonally

Core Area(s): ………………/……………..

Buffer Zone(s): ………………/……………..

Transition Area(s): ………………/……………..

Brief description of local communities living within or near the Biosphere Reserve.

……………………………………………………………………………………………..

Indicate ethnic origin and composition, minorities etc., their main economic activities (e.g. pastoralism) and the location of their main areas of concentration, with reference to a map if appropriate.

……………………………………………………………………………………………..

Name(s) of nearest major town(s).

……………………………………………………………………………………………..

Cultural significance of the site

Briefly describe the Biosphere Reserve's importance in terms of cultural values (religious, historical, political, social, ethnological).

……………………………………………………………………………………………..

Use of resources by local populations

Uses or activities in the Core Area(s):

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…………………………………………………………………………………………..

Main land uses and economic activities in the buffer zone(s):

…………………………………………………………………………………………..

Main land uses and major economic activities in the Transition Area(s):

…………………………………………………………………………………………..

Possible adverse effects of uses or activities in the transition area(s) and remedial measures taken:

…………………………………………………………………………………………..

If known, give a brief summary of past/historical land use(s) of the main parts of the Biosphere Reserve:

…………………………………………………………………………………………..

Tourism

Indicate the number of visitors coming to the Biosphere Reserve each year

National: …………………..

Foreign: …………………..

Type(s) of touristic activities (Study of fauna and flora, recreation, camping, hiking, sailing, horseriding, fishing, hunting...).

…………………………………………………………………………………………..

Tourist facilities and description of where these are located.

…………………………………………………………………………………………..

Income and benefits to local communities

Indicate for the activities described above whether the local communities derive any income directly or indirectly and through what mechanism.

…………………………………………………………………………………………..

VI. RESEARCH AND MONITORING PROGRAMMES

Brief description and list of publications of past research and/or monitoring activities.

…………………………………………………………………………………………..

Brief description of on-going research and/or monitoring activities.

Abiotic research and monitoring:

……………………………………………………………………………………………..

Biotic research and monitoring:

……………………………………………………………………………………………..

Socio-economic research:

……………………………………………………………………………………………..

Estimated number of national scientists participating in research within the Biosphere Reserve on a permanent or occasional basis.

……………………………………………………………………………………………..

Estimated number of foreign scientists participating in research within the Biosphere Reserve on a permanent or occasional basis.

……………………………………………………………………………………………..

Research station(s) within the Biosphere Reserve.

……………………………………………………………………………………………..

Permanent research station(s) outside the Biosphere Reserve.

……………………………………………………………………………………………..

Research facilities of research station(s) (meteorological and/or hydrological station, experimental plots, laboratory, library, vehicles, computers etc.).

……………………………………………………………………………………………..

Other facilities (e.g. facilities for lodging or for overnight accommodation for scientists etc.).

……………………………………………………………………………………………..

Indicate how the results of research programmes have been taken into account in the management of the biosphere reserve

……………………………………………………………………………………………..

VII. EDUCATION, TRAINING AND PUBLIC AWARENESS PROGRAMMES

Describe the types of activities related to

- Environmental education and public awareness:

……………………………………………………………………………………………..

- Training programmes for specialists:

……………………………………………………………………………………………..

Indicate whether there are facilities for education and training activities, as well as

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visitors' centres for the public

…………………………………………………………………………………………..

VIII. INSTITUTIONAL ASPECTS

State, Province, Region or other administrative units

List in hierarchical order administrative entity(ies) in which the Biosphere Reserve is located (e.g. state(s), counties, districts).

…………………………………………………………………………………………..

Management plan/policy

Indicate if a management plan or policy exists for the overall biosphere reserve.

…………………………………………………………………………………………..

If yes, briefly describe the main characteristics of this plan and precise the modes of application.

…………………………………………………………………………………………..

Authority in charge of administration of the whole, i.e. of implementation of this plan/policy:

…………………………………………………………………………………………..

Total number of staff of Biosphere Reserve:

…………………………………………………………………………………………..

Financial source(s) and yearly budget:

Indicate the source and the relative percentage of the funding (e.g. from national, regional, local administrations, private funding, international sources etc.) and the estimated yearly budget in the national currency.

…………………………………………………………………………………………..

Authority in charge of administration

The biosphere reserve as a whole:

…………………………………………………………………………………………..

Core area(s):

…………………………………………………………………………………………..

Buffer zone(s):

…………………………………………………………………………………………..

Mechanisms of consultation and co-ordination among these different authorities:

…………………………………………………………………………………………..

Where appropriate, National (or State, or Provincial) administrations to which the biosphere reserve reports:

……………………………………………………………………………………………..

Mechanism for consultation of local communities

Indicate how and to what extent local people living within or near the Biosphere Reserve.

- have been associated to the biosphere reserve nomination:

……………………………………………………………………………………………..

- participate to the decision process and management resources:

……………………………………………………………………………………………..

Indicate whether you consider the participation of local communities to be satisfactory and, if not, what measures are envisaged to improve this situation

……………………………………………………………………………………………..

Protection regime of the core area and possibly of the buffer zone

Indicate the type (e.g. under national legislation and date since when the legal protection came into being and provide justifying documents (with English or French summary of the main features).

……………………………………………………………………………………………..

Land tenure of each zone

Percentage of ownership in terms of national, state/provincial, local government, private, etc.

Core Area(s):

……………………………………………………………………………………………..

Buffer Zone(s):

……………………………………………………………………………………………..

Transition Area(s):

……………………………………………………………………………………………..

Foreseen changes in land tenure.

……………………………………………………………………………………………..

Is there a land acquisition programme, to purchase private lands, or plans for

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privatization of public lands?

…………………………………………………………………………………………………..

Contact address(es)

Contact address of the biosphere reserve for all official correspondence.

Name:……………………………………………………………………………………..

Street or P.O. Box: ………………………………………………………………………..

City with postal code: ………………………………………………………………………

Country: …………………………………………………………………………………..

Telephone: ………………………………………………………………………………..

Telefax (or telex): ………………………………………………………………………...

E-mail: ……………………………………………………………………………………

Web site address: …………………………………………………………………………

IX. CONCLUSION

Brief justification of the way in which the biosphere reserve fulfils each criteria of article 4:

1. Representative ecological systems - graduation of human interventions

………………………………………………………………………………….…………

2. Significance for biological diversity conservation

………………………………………………………………………………….…………

3. Approaches to sustainable development on a regional scale

………………………………………………………………………………….…………

4. Appropriate size to serve the three functions

………………………………………………………………………………….…………

5. Appropriate zonation to serve the three functions

………………………………………………………………………………….…………

6. Participation of public authorities and local communities

………………………………………………………………………………….…………

7. a) mechanisms to manage human use and activities

b) Management policy or plan

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c) Authority or mechanism for implementation

d) Programmes for research, monitoring, education and training

………………………………………………………………………………..………

Does the biosphere reserve have cooperative activities with other biosphere

reserves (exchanges of information and personnel, joint programmes, etc.)?

At the national level:

………………………………………………………………………………………..

Through twinning and/or transboundary biosphere reserves:

………………………………………………………………………………………..

Within the World Network (including Regional Networks):

………………………………………………………………………………………..

Obstacles encountered, measures to be taken and, if appropriate, assistance expected

from the Secretariat

………………………………………………………………………………………..

ANNEX
THE STATUTORY FRAMEWORK OF THE WORLD NETWORK OF BIOSPHERE RESERVES

INTRODUCTION

Within UNESCO's Man and the Biosphere (MAB) programme, biosphere reserves are established to promote and demonstrate a balanced relationship between humans and the biosphere. Biosphere reserves are designated by the International Co-ordinating Council of the MAB Programme, at the request of the State concerned. Biosphere reserves, each of which remains under the sole sovereignty of the State where it is situated and thereby submitted to State legislation only, form a World Network in which participation by the States is voluntary. The present Statutory Framework of the World Network of Biosphere Reserves has been formulated with the objectives of enhancing the effectiveness of individual biosphere reserves and strengthening common understanding, communication and co-operation at regional and international levels.

This Statutory Framework is intended to contribute to the widespread recognition of biosphere reserves and to encourage and promote good working examples. The delisting procedure foreseen should be considered as an exception to this basically positive approach, and should be applied only after careful examination, paying due respect to the cultural and socio-economic situation of the country, and after consulting the government concerned.

The text provides for the designation, support and promotion of biosphere reserves, while taking account of the diversity of national and local situations. States are encouraged to elaborate and implement national criteria for biosphere reserves which take into account the special conditions of the State concerned.

ARTICLE 1 - DEFINITION

Biosphere reserves are areas of terrestrial and coastal/marine ecosystems or a combination thereof, which are internationally recognized within the framework of UNESCO's programme on Man and the Biosphere (MAB), in accordance with the present Statutory Framework.

ARTICLE 2 - WORLD NETWORK OF BIOSPHERE RESERVES

1. Biosphere reserves form a worldwide network, known as the World Network of Biosphere Reserves, hereafter called the Network.
2. The Network constitutes a tool for the conservation of biological diversity and the sustainable use of its components, thus contributing to the objectives of the Convention on Biological Diversity and other pertinent conventions and instruments.
3. Individual biosphere reserves remain under the sovereign jurisdiction of the States where they are situated. Under the present Statutory Framework, States take the measures which they deem necessary according to their national legislation.

ARTICLE 3 - FUNCTIONS

In combining the three functions below, biosphere reserves should strive to be sites of excellence to explore and demonstrate approaches to conservation and sustainable development on a regional scale:
(i) conservation - contribute to the conservation of landscapes, ecosystems, species and genetic variation;
(ii) development - foster economic and human development which is socio-culturally and ecologically sustainable;

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(iii) logistic support - support for demonstration projects, environmental education and training, research and monitoring related to local, regional, national and global issues of conservation and sustainable development.

ARTICLE 4 - CRITERIA

General criteria for an area to be qualified for designation as a biosphere reserve:

1. It should encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human interventions.

2. It should be of significance for biological diversity conservation.

3. It should provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale.

4. It should have an appropriate size to serve the three functions of biosphere reserves, as set out in Article 3.

5. It should include these functions, through appropriate zonation, recognizing:

(a) a legally constituted core area or areas devoted to long-term protection, according to the conservation objectives of the biosphere reserve, and of sufficient size to meet these objectives;

(b) a buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the conservation objectives can take place;

(c) an outer transition area where sustainable resource management practices are promoted and developed.

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

7. In addition, provisions should be made for:

(a) mechanisms to manage human use and activities in the buffer zone or zones;

(b) a management policy or plan for the area as a biosphere reserve;

(c) a designated authority or mechanism to implement this policy or plan;

(d) programmes for research, monitoring, education and training.

ARTICLE 5 - DESIGNATION PROCEDURE

1. Biosphere reserves are designated for inclusion in the Network by the International Co-ordinating Council (ICC) of the MAB programme in accordance with the following procedure:

(a) States, through National MAB Committees where appropriate, forward nominations with supporting documentation to the secretariat after having reviewed potential sites, taking into account the criteria as defined in Article 4;

(b) the secretariat verifies the content and supporting documentation: in the case of incomplete nomination, the secretariat requests the missing information from the nominating State;

(c) nominations will be considered by the Advisory Committee for Biosphere Reserves for recommendation to ICC;

(d) ICC of the MAB programme takes a decision on nominations for designation. The Director-General of UNESCO notifies the State concerned of the decision of ICC.

2. States are encouraged to examine and improve the adequacy of any existing biosphere reserve, and to propose extension as appropriate, to enable it to function fully within the Network. Proposals for extension follow the same procedure as described above for new designations.

3. Biosphere reserves which have been designated before the adoption of the present Statutory Framework are considered to be already part of the Network. The provisions of the Statutory Framework therefore apply to them.

ARTICLE 6 - PUBLICITY

1. The designation of an area as a biosphere reserve should be given appropriate publicity by the State and authorities concerned, including commemorative plaques and dissemination of information material.
2. Biosphere reserves within the Network, as well as the objectives, should be given appropriate and continuing promotion.

ARTICLE 7 - PARTICIPATION IN THE NETWORK

1. States participate in or facilitate co-operative activities of the Network, including scientific research and monitoring, at the global, regional and sub-regional levels.
2. The appropriate authorities should make available the results of research, associated publications and other data, taking into account intellectual property rights, in order to ensure the proper functioning of the Network and maximize the benefits from information exchanges.
3. States and appropriate authorities should promote environmental education and training, as well as the development of human resources, in co-operation with other biosphere reserves in the Network.

ARTICLE 8 - REGIONAL AND THEMATIC SUBNETWORKS

States should encourage the constitution and co-operative operation of regional and/or thematic subnetworks of biosphere reserves, and promote development of information exchanges, including electronic information, within the framework of these subnetworks.

ARTICLE 9 - PERIODIC REVIEW

1. The status of each biosphere reserve should be subject to a periodic review 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.
2. The report will be considered by the Advisory Committee for Biosphere Reserves for recommendation to ICC.
3. ICC will examine the periodic reports from States concerned.
4. If ICC considers that the status or management of the biosphere reserve is satisfactory, or has improved since designation or the last review, this will be formally recognized by ICC.
5. If ICC considers that the biosphere reserve no longer satisfies the criteria contained in Article 4, it may recommend that the State concerned take measures to ensure conformity with the provisions of Article 4, taking into account the cultural and socio-economic context of the State concerned. ICC indicates to the secretariat actions that it should take to assist the State concerned in the implementation of such measures.
6. Should ICC find that the biosphere reserve in question still does not satisfy the criteria contained in Article 4, within a reasonable period, the area will no longer be referred to as a biosphere reserve which is part of the Network.
7. The Director-General of UNESCO notifies the State concerned of the decision of ICC.
8. Should a State wish to remove a biosphere reserve under its jurisdiction from the Network, it notifies the secretariat. This notification shall be transmitted to ICC for information. The area will then no longer be referred to as a biosphere reserve which is part of the Network.

ARTICLE 10 - SECRETARIAT

1. UNESCO shall act as the secretariat of the Network and be responsible for its functioning and promotion. The secretariat shall facilitate communication and interaction among individual

biosphere reserves and among experts. UNESCO shall also develop and maintain a worldwide accessible information system on biosphere reserves, to be linked to other relevant initiatives.
2. In order to reinforce individual biosphere reserves and the functioning of the Network and sub-networks, UNESCO shall seek financial support from bilateral and multilateral sources.
3. The list of biosphere reserves forming part of the Network, their objectives and descriptive details, shall be updated, published and distributed by the secretariat periodically.

Appendix 1.2: New periodic review form (starting 2013)

TABLE OF CONTENT

PART I: SUMMARY

INTRODUCTION

The UNESCO General Conference, at its 28th session, adopted Resolution 28 C/2.4 on the Statutory Framework of the World Network of Biosphere Reserves. This text defines in particular the criteria for an area to be qualified for designation as a biosphere reserve (Article 4). In addition, Article 9 foresees a periodic review 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. The text of the Statutory Framework is given in the third annex.

The form which follows is provided to help States to prepare their national reports in accordance with Article 9 and to update the data available to the Secretariat on the biosphere reserve concerned. This report should enable the International Coordinating Council (ICC) of the MAB Programme to review how each biosphere reserve is fulfilling the criteria of Article 4 of the Statutory Framework and in particular the three functions. It should be noted that it is requested, in the last part of the form (Criteria and Progress Made), to indicate how the biosphere reserve fulfills each of these criteria.

The information presented on this periodic review will be used in a number of ways by UNESCO:

(a) for examination of the biosphere reserve by the International Advisory Committee for Biosphere Reserves and by the Bureau of the MAB International Coordinating Council;

(b) for use in a world-wide accessible information system, notably for the UNESCO-MABnet and publications, facilitating communication and interaction amongst persons interested in

biosphere reserves throughout the world.

Kindly indicate if any part of this report should remain confidential.

The form consists of three parts:

- Part one is a summary highlighting the main changes in the biosphere reserve during the reporting period.
- Part two is more descriptive and detailed, referring to the human, physical and biological characteristics as well as to the institutional aspects.
- Part three consists of two Annexes (A): the first Annex (A.1) will be used to update the directory of biosphere reserves on the MABnet. The second annex will be used to provide promotion and communication materials of the biosphere reserve (A.2).

The third annex comprises the Statutory Framework for the World Network of Biosphere Reserves.

Please provide as many quantitative data as possible as well as supporting documentation to complete the information provided, especially:

➢ Map(s) clearly showing the zonation (in particular 2.3.1);

➢ The legal texts for the different zones.

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PART II: PERIODIC REVIEW REPORT

Annexes

PART I: SUMMARY

a)   Name of the biosphere reserve:

b)   Country:

c)   Year of designation:

d)   Year(s) of periodic review(s):

e)   Previous recommendation(s) made by the International Co-ordinating Council (MAB-ICC), if applicable:

f)   What follow-up actions are completed and if not completed/initiated, please provide justifications.

g)   Update on the implementation of measures to achieve the objectives of the biosphere reserve.

h)   Briefly describe the process by which the current periodic review has been conducted:

i)   Area and spatial configuration:

	Previous report (nomination form or periodic review) and date	Proposed changes (if any)
Area of terrestrial Core Area(s)		
Area of terrestrial Buffer Zone(s)		
Area of terrestrial Transition Area(s)		
Area of marine Core Area(s)		
Area of marine Buffer Zone(s)		
Size of marine Transition Area(s)		

j)   Human population of the biosphere reserve:

	Previous report (nomination form or periodic review) and date	At present (please state date of census or other source)
Core Area(s) (permanent and seasonally)		
Buffer Zone(s) (permanent and seasonally)		
Transition Area(s) (permanent and seasonally)		

k)   Budget (main sources of funds, special capital funds) and international, regional or national relevant projects/initiatives carried out or planned.

Budget in the previous report (nomination form or periodic review) and date	Current budget

l)   International, regional, multilateral or bilateral framework of cooperation. Describe, where applicable, the contribution of the biosphere reserve to achieve objectives and developing mechanisms that contribute to the implementation of international or regional bilateral or multilateral agreements, conventions, etc.

PART II: PERIODIC REVIEW REPORT

1. BIOSPHERE RESERVE:

1.1 Year designated:

1.2 Year of first periodic review and of any following periodic review(s) (when appropriate):

1.3 Follow-up actions taken in response to each recommendation from the previous periodic review(s) (if applicable), and if not completed/initiated, please provide justifications.

1.4 Other observations or comments on the above.

1.5 Describe in detail the process by which the current periodic review has been conducted:
1.5.1 Which stakeholders were involved?

1.5.2 What methodology was used to involve stakeholders in the process (e.g., workshops, meetings, consultation with experts).

1.5.3 How many meetings, workshops, etc. occurred throughout the process of conducting this review?

1.5.4 Were they well attended, with full and balanced representation?
(Describe participation and stakeholders).

2. SIGNIFICANT CHANGES IN THE BIOSPHERE RESERVE DURING THE PAST TEN YEARS:
2.1 Brief summary overview: Narrative account of important changes in the local economy, landscapes or habitat use, and other related issues. Note important changes in the institutional arrangements for governance of the biosphere reserve area, and changes (if any) in the coordinating arrangements (including the biosphere reserve organization/coordinator/manager) that provide direction for the biosphere reserve. Identify the role of biosphere reserve organization/coordinator/manager in initiating or responding to these changes.

2.2 Updated background information about the biosphere reserve.

2.2.1 Updated coordinates (if applicable). If any changes in the biosphere reserve's standard geographical coordinates, please provide them here (all projected under WGS 84):

Cardinal points:	Latitude	Longitude
Most central point:		
Northernmost point:		
Southernmost point:		
Westernmost point:		
Easternmost point:		

2.2.2 If necessary, provide an updated map on a topographic layer of the precise location and delimitation of the three zones of the biosphere reserve Map(s) shall be provided in both paper and electronic copies. Shape files (also in WGS 84 projection system) used to produce the map must also be attached to the electronic copy of the form.
If applicable, also provide a link to access this map on the internet (e.g. Google map, website).

2.2.3 Changes in the human population of the biosphere reserve.
Most recent census data:

2.2.4 Update on conservation function, including main changes since last report.
 (Note briefly here and refer to 4 below).

2.2.5 Update on the development function, including main changes since last report.
(Note briefly here and refer to 5 below).

2.2.6 Update on logistic support function, including main changes since last report.
(Note briefly here and refer to 6 below).

2.2.7 Update on governance management and coordination, including changes since last report (if any) in hierarchy of administrative divisions, coordination structure.
(Note briefly here and refer to 7 below).

2.3 The authority/authorities in charge of coordinating/managing the biosphere reserve:
(Comment on the following topics as much as is relevant).
2.3.1 Updates to cooperation/management policy/plan, including vision statement, goals and objectives, either current or for the next 5-10 years
2.3.2 Budget and staff support, including approximate average annual amounts (or range from year-to-year); main sources of funds (including financial partnerships established (private/public), innovative financial schemes); special capital funds (if applicable); number of full and/or part-time staff; in-kind contribution of staff; volunteer contributions of time or other support.

2.3.3 Communications strategy for the biosphere reserve including different approaches and tools geared towards the community and/or towards soliciting outside support.

2.3.4 Strategies for fostering networks of cooperation in the biosphere reserve that serve as connections ("bridging") among diverse groups in different sectors of the community (e.g. groups devoted to agricultural issues, local economic development, tourism, conservation of ecosystems, research and monitoring).

2.3.5 Particular vision and approaches adopted for addressing the socio- cultural context and role of the biosphere reserve (e.g. promotion of local heritage resources, history, cultural and cross-cultural learning opportunities; cooperation with local population; reaching out to recent immigrant groups, indigenous people etc.).

2.3.6 Use of traditional and local knowledge in the management of the biosphere reserve.

Community cultural development initiatives. Programmes and actions to promote community language, and, both tangible and intangible cultural heritage. Are spiritual and cultural values and customary practices promoted and transmitted?

2.3.8 Specify the number of spoken and written languages (including ethnic, minority and endangered languages) in the biosphere reserve. Has there been a change in the number of spoken and written languages? Has there been a revitalization programme for endangered languages?

2.3.9 Management effectiveness. Obstacles encountered in the management/coordination of the biosphere reserve or challenges to its effective functioning.

2.4 Comment on the following matters of special interest in regard to this biosphere reserve: (Refer to other sections below where appropriate).

2.4.1 Is the biosphere reserve addressed specifically in any local, regional or/and national development plan? If so, what plan(s)? Briefly describe such plans that have been completed or revised in the past 10 years.

2.4.2 Outcomes of management/cooperation plans of government agencies and other organizations in the biosphere reserve.

2.4.3 Continued involvement of local people in the work of the biosphere reserve. Which communities, groups, etc. How are they involved?

2.4.4 Women's roles. Do women participate in community organizations and decision-making processes? Are their interests and needs given equal consideration within the biosphere reserve? What incentives or programmes are in place to encourage their representation and participation? (e.g. was a "gender impact assessment" carried out?) Are there any studies that examine a) whether men and women have different access to and control over sources of income and b) which sources of income do women control? If so, provide reference of these studies and/or a paper copy in an annex.

2.4.5 Are there any changes in the main protection regime of the core area(s) and of the buffer zone(s)?

2.4.6What research and monitoring activities have been undertaken in the biosphere reserve by local universities, government agencies, stakeholders and/or linked with national and international programs?

2.4.7 How have collective capacities for the overall governance of the biosphere reserve (e.g. organization of new networks of cooperation, partnerships) been strengthened?

2.4.8. Please provide some additional information about the interaction between the three zones.

2.4.9 Participation of young people. How were young people involved in the organizations and community decision-making processes? How were their interests and needs considered within the biosphere reserve? What are the incentives or programs in place to encourage their participation?

3. ECOSYSTEM SERVICES:
3.1 If possible, provide an update in the ecosystem services provided by each ecosystem of the biosphere reserve and the beneficiaries of these services.
(As per previous report and with reference to the Millennium Ecosystem Assessment Framework and The Economics of Ecosystems and Biodiversity (TEEB) Framework (http://millenniumassessment.org/en/Framework.html and http://www.teebweb.org/publications/teeb-study-reports/foundations/)).

3.2 Specify if there are any changes regarding the indicators of ecosystem services that are being used to evaluate the three functions (conservation, development and logistic) of the biosphere reserve. If yes, which ones and give details and update.

3.3 Update description on biodiversity involved in the provision of ecosystems services in the biosphere reserve (e.g. species or groups of species involved).

3.4 Specify whether any recent/updated ecosystem services assessment has been done for the biosphere reserve since its nomination/last report. If yes, please specify and indicate if and how this is being used in the management plan.

4. THE CONSERVATION FUNCTION:
[This refers to programmes that seek to protect biodiversity at landscape and site levels and/or ecological functions that provide ecosystem goods and services in the biosphere reserve. While actions to address this function might be focused on core area(s) and buffer zone(s), ecosystem dynamics occur across a range of spatial and temporal scales throughout the biosphere reserve and beyond.]

4.1 Significant changes (if any) in the main habitat types, ecosystems, species or varieties of traditional or economic importance identified for the biosphere reserve, including natural processes or events, main human impacts, and/or relevant management practices (since the last report).

4.2 Describe the main conservation programmes that have been conducted in the biosphere reserve over the past ten years as well as current on-going ones. Note their main goals and the scope of activities, e.g. biotic inventories, species-at-risk, landscape analyses, conservation stewardship actions. Cross reference to other sections below where appropriate.
4.3 In what ways are conservation activities linked to, or integrated with, sustainable development issues (e.g. stewardship for conservation on private lands used for other purposes)?

4.4 How do you assess the effectiveness of actions or strategies applied?
(Describe the methods, indicators used).

4.5 What are the main factors that influenced (positively or negatively) the successes of conservation efforts in the entire biosphere reserve? Given the experiences and lessons learned in the past ten years, what new strategies or approaches will be imost effective for conservation for sustainable development?

4.6 Other comments/observations from a biosphere reserve perspective.

5. THE DEVELOPMENT FUNCTION*:*
[This refers to programmes that address sustainability issues at the individual livelihood and community levels, including economic trends in different sectors that drive the need to innovate and/or adapt, the main adaptive strategies being implemented within the biosphere reserve, and initiatives to

develop certain sectors such as tourism to complement and/or compensate for losses in other markets, employment, and community well-being over the past ten years]

5.1 Briefly describe the prevailing trends over the past decade in each main sector of the economic base of the biosphere reserve (e.g. agriculture and forest activities, renewable resources, non-renewable resources, manufacturing and construction, tourism and other service industries).

5.2 Describe the tourism industry in the biosphere reserve. Has tourism increased or decreased since nomination or the last periodic review? What new projects or initiatives have been undertaken? What types of tourism activities? What effect have these activities had on the economy, ecology and society of the biosphere reserve? Are there any studies that examine whether designation of the area as a biosphere reserve has influenced the number of tourists? Please provide the bibliographic information of any studies and/or a paper copy in an annex.

5.3 When applicable, describe other key sectors and uses such as agriculture, fishing, forestry. Have they increased or decreased since the nomination or the last periodic review? What kind of new projects or initiatives have been undertaken? What effect have they had on the economy and ecology of the biosphere reserve, and on its biodiversity? Are there any studies that examine whether designation as a biosphere reserve has influenced the frequency of its activities? If so, provide the bibliographic information of these studies and/or a paper copy in an annex.

5.4 How do economic activities in the biosphere benefit local communities?

5.5 How do you assess the effectiveness of actions or strategies applied?
(Describe the methods, indicators).

5.6 Community economic development initiatives. What programmes exist to promote comprehensive strategies for economic innovation, change, and adaptation within the biosphere reserve, and to what extent are they implemented?
5.7 Local business or other economic development initiatives. Are there specific "green" alternatives being undertaken to address sustainability issues? What relationships (if any) are there among these different activities?

5.8 Describe the main changes (if there are any) in terms of cultural values (religious, historical, political, social, ethnological) and others, if possible with distinction between material and intangible heritage.(c.f. UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage 1972 and UNESCO Convention for the Safeguard of the Intangible Cultural Heritage 2003 (http://portal.unesco.org/en/ev.php
URL_ID=13055&URL_DO=DO_TOPIC&URL_SECTION=201.html and
http://portal.unesco.org/en/ev.php-
URL_ID=17716&URL_DO=DO_TOPIC&URL_SECTION=201.html)).

5.9 Community support facilities and services. What programmes in/for the biosphere reserve address issues such as job preparation and skills training, health and social services, and social justice questions. What are the relationships among them and with community economic development?

5.10 What indicators are in place to assess the effectiveness of activities aiming to foster sustainable development? What have these indicators shown?

5.11 What are the main factors that influenced (positively or negatively) the success of development efforts in the entire biosphere reserve? Given the experiences and lessons learned in the past ten years, what new strategies or approaches will be most effective?

6. THE LOGISTIC FUNCTION:
[This refers to programs that enhance the capacity of people and organizations in the biosphere reserve to address both conservation and development issues for sustainable development as well as research, monitoring, demonstration projects and education needed to deal with the specific context and conditions of the biosphere reserve.]

6.1 Describe the main institutions conducting research or monitoring in the biosphere reserve, and their programmes. Comment on organizational changes (if any) in these institutions over the past ten years as they relate to their work in the biosphere reserve.

6.2 Summarize the main themes of research and monitoring undertaken over the past ten years and the area(s) in which they were undertaken in order to address specific questions related to biosphere reserve management and for the implementation of the management plan (please refer to variables in Annex I).
(For each specific topic provide reference citations. Provide the full citations alphabetically by lead author at the end of Section 6 or in a separate annex).

6.3 Describe how traditional and local knowledge and knowledge from relating to management practices have been collected, synthesized and disseminated. Explain how such knowledge is being applied to new management practices, and how and if it has been integrated into training and educational programmes.
6.4 Environmental/sustainability education. Which are the main educational institutions ("formal" – schools, colleges, universities, and "informal" services for the general public) that are active in the biosphere reserve? Describe their programmes, including special school or adult education programmes, as these contribute towards the functions of the biosphere reserve. Comment on organizational changes (if any) in institutions and programmes that were identified in the biosphere

reserve ten or so years ago (e.g. closed down, redesigned, new initiatives). Refer to programmes and initiatives of UNESCO Associated Schools networks, UNESCO Chairs and Centers where applicable.

6.5 How do you assess the effectiveness of actions or strategies applied?
(Describe the methods, indicators).

6.5.1 Describe the biosphere reserve's main internal and external communication mechanisms/systems
6.5.2 Is there a biosphere reserve website? If so, provide the link.

6.5.3 Is there an electronic newsletter? How often is it published? (provide the link, if applicable).

6.5.4 Does the biosphere reserve belong to a social network (Facebook, Twitter, etc.)? Provide the contact.

6.5.5 Are there any other internal communication systems? If so, describe them.

6.6 Describe how the biosphere reserve currently contributes to the World Network of Biosphere Reserves and/or could do so in the future.

6.6.1 Describe any collaboration with existing biosphere reserves at national, regional, and international levels, also within regional and bilateral agreements.

6.6.2 What are the current and expected benefits of international cooperation for the biosphere reserve?

6.6.3 How do you intend to contribute to the World Network of Biosphere Reserves in the future and to the Regional and Thematic Networks?

6.7 What are the main factors that influenced (positively or negatively) the success of activities contributing to the logistic support function? Given the experiences and lessons learned in the past ten years, what new strategies or approaches will be favored as being most effective?

6.8 Other comments/observations from a biosphere reserve perspective.

7. GOVERNANCE, BIOSPHERE RESERVE MANAGEMENT AND COORDINATION:
[Biosphere reserve coordination/management coordinators/managers have to work within extensive overlays of government bodies, business enterprises, and a "civil society" mix of non-governmental organizations and community groups. These collectively constitute the structures of governance for the area of the biosphere reserve. Success in carrying out the functions of a biosphere reserve can be crucially dependent upon the collaborative arrangements that evolve with these organizations and

actors. Key roles for those responsible for the biosphere reserve coordination/management are to learn about the governance system they must work within and to explore ways to enhance its   collective capacities for fulfilling the functions of the biosphere reserve.]

7.1 What are the technical and logistical resources for the coordination of the biosphere reserve?

7.2 What is the overall framework for governance in the area of the biosphere reserve? Identify the main components and their contributions to the biosphere reserve.

7.3 Describe social impact assessments or similar tools and guidelines used to support indigenous and local rights and cultural initiatives (e.g. CBD Akwé:Kon guidelines, Free, Prior, and Informed Consent Programme/policy, access and benefit sharing institutional arrangements, etc.).

7.4 What (if any) are the main conflicts relating to the biosphere reserve and what solutions have been implemented?

7.4.1 Describe the main conflicts regarding access to, or the use of, resources in the area and the relevant timeframe. If the biosphere reserve has contributed to preventing or resolving some of these conflicts, explain what has been resolved or prevented, and how this was achieved for each zone?

7.4.2 Describe any conflicts in competence among the different administrative authorities involved in the management of the area comprising the biosphere reserve.

7.4.3 Explain the means used to resolve these conflicts, and their effectiveness. Describe its composition and functioning, resolution on a case-by-case basis. Are there local mediators; if so, are they approved by the biosphere reserve or by another authority?

7.5 Updated information about the representation and consultation of local communities and their participation in the life of the biosphere reserve:

7.5.1 Describe how local people (including women and indigenous people) are represented in the planning and management of the biosphere reserve (e.g., assembly of representatives, consultation of associations, women's groups).

7.5.2 What form does this representation take: companies, associations, environmental associations, trade unions (list the various groups)?

7.5.3 Indicate whether there are procedures for integrating the representative body of local communities (e.g., financial, election of representatives, traditional authorities).

7.5.4 How long-lived is the consultation mechanism (e.g., permanent assembly, consultation on specific projects)?

7.5.5 What is the impact of this consultation on the decision-making process (decisional, consultative or merely to inform the population)?

7.5.6 At which step in the existence of a biosphere reserve is the population involved: creation of the biosphere reserve, drawing up of the management plan, implementation of the plan, day to day management of the biosphere reserve? Give some practical examples.

7.6 Update on management and coordination structure:
7.6.1 Describe any changes regarding administrative authorities that have competence for each zone of the biosphere reserve (core area(s), buffer zone(s) and transition area(s))? If there are any changes since the nomination form/last periodic review report, please submit the original endorsements for each area.

7.6.2 Update information about the manager(s)/coordinator(s) of the biosphere reserve including designation procedures.

7.6.3 Are there any changes with regard to the coordination structure of the biosphere reserve? (if yes, describe in details its functioning, composition and the relative proportion of each group in this structure, its role and competence.). Is this coordination structure autonomous or is it under the authority of local or central government, or of the manager of the biosphere reserve?).

7.6.4 How has the management/coordination been adapted to the local situation?

7.6.5 Was the effectiveness of the management/coordination evaluated? If yes, was it according to a procedure?

7.7 Update on the management/cooperation plan/policy:

7.7.1 Are there any changes with regard to the management/cooperation plan/policy and the stakeholders involved? If yes, provide detailed information on process for involvement of stakeholders, adoption and revision of the plan.

7.7.2 Describe contents of the management/cooperation plan (provide some examples of measures and guidelines). Is the plan binding? Is it based on consensus?

7.7.3 Describe the role of the authorities in charge of the implementation of the plan. Describe institutional changes since the nomination form/last periodic review report. Please provide evidence of the role of these authorities.

7.7.4 Indicate how the management plan addresses the objectives of the biosphere reserve.

7.7.5 What are the progresses with regard to the guidelines of the management/cooperation plan/policy?

7.7.6 Were there any factors and/or changes that impeded or helped with the implementation of the management/coordination plan/policy? (Reluctance of local people, conflicts between different levels of decision-making).

7.7.7 If applicable, how is the biosphere integrated in regional/national strategies? Vice versa, how are the local/municipal plans integrated in the planning of the biosphere reserve?
(Please provide detailed information if there are any changes since the nomination form/last periodic review report).

8. CRITERIA AND PROGRESS MADE:
[Conclude by highlighting the major changes, achievements, and progress made in your biosphere reserve since nomination or the last periodic review. How does your biosphere reserve fulfill the criteria. Develop justification for the site to be a biosphere reserve and rationale for the zonation. What is lacking, and how could it be improved? What can your biosphere reserve share with others on how to implement sustainable development into practice?]

Brief justification of the way in which the biosphere reserve fulfills each criteria of article 4 of the Statutory Framework of the World Network of Biosphere Reserves:
"Encompass a mosaic of ecological systems representative of major biogeographic region(s), including a gradation of human interventions".
(The term "major biogeographic region" is not strictly defined but it would be useful to refer to the Udvardy classification system (http://www.unep-wcmc.org/udvardys-biogeographical-provinces-1975_745.html)).
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2.   "Be of Significance for biological diversity conservation".

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3.   "Provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale".
(Including examples or learning experiences from putting sustainable development into practice).

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4.   "Have an appropriate size to serve the three functions of biosphere reserves".

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5.　　　Appropriate zonation to serve the three functions

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

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7.　　　Mechanisms for implementation:
a) Mechanisms to manage human use and activities
b) Management policy or plan
c) Authority or mechanism to implement this policy or plan
d) Programmes for research, monitoring, education and training

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Does the biosphere reserve have cooperative activities with other biosphere reserves (exchanges of information and staff, joint programmes, etc.)?
At the national level:

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At the regional level:

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Through twinning and/or transboundary biosphere reserves:

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Obstacles encountered, measures to be taken and, if appropriate, assistance expected from the Secretariat:

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Main objectives of the Biosphere Reserve:

Describe the main objectives of the biosphere reserve integrating the three functions and the sustainable development objectives for the coming years.

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9. SUPPORTING DOCUMENTS

[List of the annexes submitted with periodic review report.]

(1) Updated location and zonation map with coordinates
[Provide the biosphere reserve's standard geographical coordinates (all projected under WGS 84). Provide a map on a topographic layer of the precise location and delimitation of the three zones of the biosphere reserve (Map(s) shall be provided in both paper and electronic copies). Shapefiles (also in WGS 84 projection system) used to produce the map must also be attached to the electronic copy of the form. If applicable, also provide a link to access this map on the internet (e.g. Google map, website…).]

(2) Updated vegetation map or land cover map
[A vegetation map or land cover map showing the principal habitats and land cover types of the biosphere reserve should be provided, if available.]

(3) Updated list of legal documents (if possible with English, French or Spanish synthesis of its contents and a translation of its most relevant provisions)
[If applicable update the principal legal documents since the nomination of the biosphere reserve and provide a copy of these documents.]

(4) Updated list of land use and management/cooperation plans
[List existing land use and management/cooperation plans (with dates and reference numbers) for the administrative area(s) included within the biosphere reserve. Provide a copy of these documents. It is recommended to produce an English, French or Spanish synthesis of its contents and a translation of its most relevant provisions.]

(5) Updated species list (to be annexed)
[Provide a list of important species occurring within the proposed biosphere reserve, including common names, wherever possible.]

(6) Updated list of main bibliographic references (to be annexed)

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[Provide a list of the main publications and articles of relevance to the proposed biosphere reserve.]

(7) Further supporting documents.

10. ADRESSES

10.1 Contact address of the proposed biosphere reserve:

[Government agency, organization, or other entity (entities) to serve as the main contact to whom all correspondence within the World Network of Biosphere Reserves should be addressed.]

Name:
Street or P.O. Box: _____
City with postal code: _____
Country: _____
Telephone: _____
E-mail: _____
Web site: _____
_____

20.2. Administering entity of the core area(s):

Name:
Street or P.O. Box: _____
City with postal code: _____
Country: _____
Telephone: _____
E-mail: _____
Web site:

20.3. Administering entity of the buffer zone(s):

Name:
Street or P.O. Box: _____
City with postal code: _____
Country: _____
Telephone: _____
E-mail: _____
Web site:_____
_____

20.4. Administering entity of the transition area(s):

Name:

Street or P.O. Box: _____

City with postal code: _____

Country: _____

Telephone: _____

E-mail: _____

Web site: _____

Annex I to the Biosphere Reserve Periodic Review, January 2013
MABnet Directory of Biosphere Reserves

Administrative details

Country:

Name of BR:

Year designated:

Administrative authorities: (7.6)

Name Contact: (10.1)

Contact address: *(Including phone number, postal and email adresses)* (10.1)

Related links: *(web sites)*

 Social networks: (6.5.4)

Description

General description:

> Approximately 25 lines

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Major ecosystem type:

Major habitats & land cover types:

Bioclimatic zone:

Location (latitude & longitude):

Total Area (ha):

Core area(s):

Buffer zone(s):

Transition area(s) :

Different existing zonation:

Altitudinal range (metres above sea level):

Zonation map(s) (refer to section 2.2.2):

Main objectives of the biosphere reserve

Brief description

Approximately 5 lines

Research

Brief description

Approximately 5 lines

Monitoring

Brief description

Approximately 5 lines

Specific variables (fill in the table below and tick the relevant parameters)

Abiotic		Biodiversity	
Abiotic factors		Afforestation/Reforestation	
Acidic deposition/Atmospheric factors		Algae	
Air quality		Alien and/or invasive species	
Air temperature		Amphibians	
Climate, climatology		Arid and semi-arid systems	
Contaminants		Autoecology	
Drought		Beach/soft bottom systems	
Erosion		Benthos	
Geology		Biodiversity aspects	
Geomorphology		Biogeography	
Geophysics		Biology	
Glaciology		Biotechnology	
Global change		Birds	
Groundwater		Boreal forest systems	
Habitat issues		Breeding	
Heavy metals		Coastal/marine systems	
Hydrology		Community studies	
Indicators		Conservation	
Meteorology		Coral reefs	
Modeling		Degraded areas	
Monitoring/methodologies		Desertification	
Nutrients		Dune systems	
Physical oceanography		Ecology	
Pollution, pollutants		Ecosystem assessment	
Siltation/sedimentation		Ecosystem functioning/structure	
Soil		Ecosystem services	
Speleology		Ecotones	
Topography		Endemic species	
Toxicology		Ethology	
UV radiation		Evapotranspiration	
		Evolutionary studies/Palaeoecology	
		Fauna	
		Fires/fire ecology	
		Fishes	
		Flora	
		Forest systems	
		Freshwater systems	
		Fungi	
		Genetic resources	
		Genetically modified organisms	

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Abiotic		Biodiversity	
		Home gardens	
		Indicators	
		Invertebrates	
		Island systems/studies	
		Lagoon systems	
		Lichens	
		Mammals	
		Mangrove systems	
		Mediterranean type systems	
		Microorganisms	
		Migrating populations	
		Modeling	
		Monitoring/methodologies	
		Mountain and highland systems	
		Natural and other resources	
		Natural medicinal products	
		Perturbations and resilience	
		Pests/Diseases	
		Phenology	
		Phytosociology/Succession	
		Plankton	
		Plants	
		Polar systems	
		Pollination	
		Population genetics/dynamics	
		Productivity	
		Rare/Endangered species	
		Reptiles	
		Restoration/Rehabilitation	
		Species (re) introduction	
		Species inventorying	
		Sub-tropical and temperate rainforest	
		Taxonomy	
		Temperate forest systems	
		Temperate grassland systems	
		Tropical dry forest systems	
		Tropical grassland and savannah	
		Tropical humid forest systems	
		Tundra systems	
		Vegetation studies	
		Volcanic/Geothermal systems	
		Wetland systems	
		Wildlife	

Integrated monitoring		Integrated monitoring	
Agriculture/Other production systems		Biogeochemical studies	
Agroforestry		Carrying capacity	
Anthropological studies		Climate change	
Aquaculture		Conflict analysis/resolution	
Archaeology		Ecosystem approach	
Bioprospecting		Education and public awareness	
Capacity building		Environmental changes	
Cottage (home-based) industry		Geographic Information System (GIS)	
Cultural aspects		Impact and risk studies	
Demography		Indicators	
Economic studies		Indicators of environmental quality	
Economically important species		Infrastructure development	
Energy production systems		Institutional and legal aspects	
Ethnology/traditional practices/knowledge		Integrated studies	
Firewood cutting		Interdisciplinary studies	
Fishery		Land tenure	
Forestry		Land use/Land cover	
Human health		Landscape inventorying/monitoring	
Human migration		Management issues	
Hunting		Mapping	
Indicators		Modeling	
Indicators of sustainability		Monitoring/methodologies	
Indigenous people's issues		Planning and zoning measures	
Industry		Policy issues	
Livelihood measures		Remote sensing	
Livestock and related impacts		Rural systems	
Local participation		Sustainable development/use	
Micro-credits		Transboundary issues/measures	
Mining		Urban systems	
Modeling		Watershed studies/monitoring	
Monitoring/methodologies			
Natural hazards			
Non-timber forest products			
Pastoralism			
People-Nature relations			
Poverty			
Quality economies/marketing			
Recreation			
Resource use			
Role of women			
Sacred sites			
Small business initiatives			
Social/Socio-economic aspects			
Stakeholders' interests			
Tourism			
Transports			

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Provide some promotional material regarding the site, notably high quality photos, and/or short videos on the site so as to allow the Secretariat to prepare appropriate files for press events. To this end, a selection of photographs in high resolution (300 dpi), with photo credits and captions and video footage (rushes), without any comments or sub-titles, of professional quality – DV CAM or BETA only, will be needed.
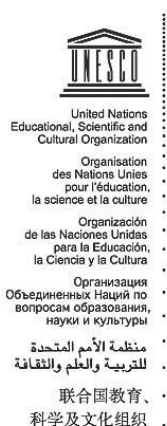
UNESCO Photo Library

Bureau of Public Information

AGREEMENT GRANTING NON-EXCLUSIVE RIGHTS

Reference:

1. a) I the undersigned, copyright-holder of the above mentioned video(s) hereby grant to UNESCO free of charge the non-exclusive right to exploit, publish, reproduce, diffuse, communicate to the public in any form and on any support, including digital, all or part of the photograph(s) and to licence these rights to third parties on the basis of the rights herein vested in UNESCO

    b) These rights are granted to UNESCO for the legal term of copyright throughout the world.

    c) The name of the author/copyright holder will be cited alongside UNESCO's whenever his/her work is used in any form.

2. I certify that:

    a) I am the sole copyright holder of the video(s) and am the owner of the rights granted by virtue of this agreement and other rights conferred to me by national legislation and pertinent international conventions on copyright and that I have full rights to enter into this agreement.

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Name and Address:

Signature :   Date:

(Sign, return to UNESCO two copies of the Agreement and retain the original for yourself)

Mailing address: 7 Place Fontenoy, 75352 Paris 07 SP, Direct Telephone: 00331 – 45681687
Direct Fax: 00331 – 45685655; e-mail: photobank@unesco.org; m.ravassard@unesco.org

Annex III to the Biosphere Reserve Periodic Review, January 2013

The Statutory Framework of the World Network of Biosphere Reserves

(same as Annex 2.2 above)

Appendix 2: Online survey protocol

Appendix 2.1: Introductory letter (emailed in 3 languages)

Attention Mr/Ms …:

Hereby is an invitation to participate in an **independent academic research** supported by **UNESCO-MAB Headquarters** (*letter attached*), and **IUCN-Med** North Africa Programme.

As a PhD Candidate and professional in the field of protected areas management, I am interested in understanding the Status of Biosphere Reserves Concept Implementation and Management in the Arab Region, and supporting their success. As a responsible/being in charge of BRs in your country, your input is essential to the success of this research project.

The results will be used to identify strengths and weaknesses, and develop specific management recommendations to Arab biosphere reserves. Summaries of results will be provided to respondents on the individual status of their biosphere reserve management, which will potentially support the management team to identify priorities and help guide its future management actions. Anonymity and confidentiality will be guaranteed in potential publications (unless otherwise mentioned by the respondent).

Kindly complete this survey **no later than November 20, 2013** by following the link provided below. It is encouraged to complete it in consultation with other members of the management team. The survey is expected to take approximately 30 minutes, and **can be completed gradually by using the "_Save and continue survey later_" tab at the top of the page** (starting on page 2).

Please make sure you have a good Internet connection while taking the survey to avoid loss of data.

 If you are ready to start, please go to:

   http://edu.surveygizmo.com/s3/1252090/

Attached is the questionnaire in pdf version to be used only for reference / reading.

Kindly fill one questionnaire only for each BR through the link, and abstain from distributing this survey to respect confidentiality.

For any other queries please contact diane.matar@mespom.eu
Your participation is valuable and highly appreciated!

Many thanks in advance.

A l'attention de Mr/Mme …:

Ceci est une invitation pour participer à une **recherche universitaire independante** appuyée par le Secretariat de l' **UNESCO-MAB** (*lettre d'appui ci-jointe*), et par **UICN-Med** Programme Afrique du Nord.

En tant que doctorante et spécialiste dans la gestion des aires protégées, je m'intéresse à comprendre la situation des réserves de la biosphère (RB): "concept mis en œuvre" et de leur gestion dans les pays de Nord-Afrique et du Moyen-Orient, pour mieux garantir leur succès. Etant vous-même responsable des RB dans votre pays, votre contribution serait essentielle à la réussite de ce projet.

Les résultats seront utilisés pour identifier les forces et les faiblesses, et pour élaborer des recommandations spécifiques de gestion des RB dans votre région. Les résumés des résultats seront fournis aux répondants sur la situation individuelle de leur gestion de la RB, et seront certainement utiles à votre équipe de gestion pour identifier les priorités et orienter ses décisions futures de gestion.

L'anonymat et la confidentialité seront garantis dans les publications potentielles (sauf mention du contraire par le répondant).

Vous êtes priés de compléter ce questionnaire **au plus tard le 20 Novembre 2013**, en suivant le lien ci-dessous. Il est fortement recommandé de le remplir en consultation avec les autres membres de l'équipe de gestion. L'enquête devrait prendre approximativement 30 minutes au total, et **peut être effectuée progressivement en utilisant l'option "*Sauvegarder et continuer l'enquête plus tard*" en haut de chaque page** (à partir de la page 2).

Assurez-vous s'il vous plaît, d'avoir une bonne connexion Internet tout en prenant l'enquête pour éviter la perte de données.

Si vous êtes prêt/e à commencer, suivez le lien:

http://edu.surveygizmo.com/s3/1252090/63dd9d722e79

Prière de remplir un questionnaire seulement pour chaque RB à travers le lien, et s'abstenir de distribuer cette enquête par respect à la confidentialité.

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Ci-joint le questionnaire en version pdf à utiliser seulement pour votre référence/lecture.

Pour toute information, **veuillez contacter diane.matar@mespom.eu**

Votre participation serait précieuse et très appréciée!

Merci d'avance,

إذا كنت تفضّل أن تجيب على أسئلة هذه الدراسة باللغة العربية، عليك أولاً طباعة كامل المستند المرفق ثم الإجابة على الأسئلة خطياً وإرساله بالبريد الإلكتروني (بواسطة السكانر) وذلك قبل **25 تشرين الثاني 2013 شكرا"**.

Diane Matar
PhD Candidate
Academic profile
Environmental Sciences and Policy
Central European University
1051 Budapest, Hungary
S: diane_matar, T: @DianeMatar

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UNESCO Biosphere Reserves Management Survey for the Arab Region

Background

1) About the Biosphere Reserve (BR)

BR official name: _____

Country

( ) Algeria

( ) Egypt

( ) Jordan

( ) Lebanon

( ) Morocco

( ) Tunisia

( ) Qatar

( ) Sudan

( ) Syria

( ) UAE

( ) Yemen

2) About you (you can chose to remain anonymous, only Email* required)

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First name: _____

Last name: _____

Email address*: _____

Phone Number (include country code): _____

Mobile Number (include country code): _____

3) What is your job title in relation to the BR? Briefly mention your responsibilities

_____

_____

_____

_____

4) In the table below, please indicate all existing national or international designations for the site, including UNESCO

Biosphere Reserve

For each designation, please indicate the corresponding Year, official Title, Zone(s) covered, and whether the designation is Statutory

(established in law) or not.

Note: CZ= Core Zone; BZ= Buffer Zone; TZ= Transition Zone

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Year	Designation	Zones covered (check all that apply)						Statutory	
		CZ partial	CZ total	BZ partial	BZ total	TZ partial	TZ total	Yes	No
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]		
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]		
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]		
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]		
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]		

5) Rank from 1 to 5 in order of priority what you think a UNESCO Biosphere Reserve is generally created for (1 indicates the highest priority). The same number cannot be selected more than once!

_____Conservation of natural values

_____Environmental education

_____Environmental research and monitoring

_____Preservation of cultural heritage

_____Sustainable development

6) What type of institution is currently managing your biosphere reserve?

( ) Non-Governmental Organization (NGO)

( ) Government institution

( ) Private entity

( ) Local community

( ) It is co-managed; please indicate the different institution types and respective responsibilities:

_____

_____

_____

_____

7) How would you describe your communication with the National UNESCO-MAB Committee in your country?

( ) Good

( ) Average

( ) Weak

8) Please describe your relationship with the national, regional and international UNESCO-MAB institutions, concerning the management of the BR.

_____

_____

_____

_____

_____

_____

_____

9) Have you/your institution been previously approached for a regional or international study concerning BR

management?

( ) No

( ) I don't know

( ) Yes, please provide reference institution and/or name of study: _____

10) Does your BR currently have an operational management?

Operational Management refers to the presence of a minimal amount of staff, work program (activities, plans, projects) and budget,

dedicated to the management of the BR.

( ) Yes

( ) No

Comments:

_____

_____

IF YOUR ANSWER IS NO, GO DIRECTLY TO QUESTION 24

Biosphere Reserve Implementation

11) Rank the items below from 1 to 5 indicating the most (1) to the least (5) applied in your BR*, the same number cannot be selected more than once!

_____Conservation of natural values

_____Environmental education

_____Environmental research and monitoring

_____Preservation of cultural heritage

_____Sustainable development

12) Please select the most applicable answer to the statements below*

	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
The 3 zones (core, buffer, transition) are well delineated and defined					
Although designated as a BR, the site is only managed as a protected area based on national designation(s)					
The management plan defines strategies and actions for each zone					
Conservation of natural value activities take place mainly in the core zone					
Sustainable/eco-friendly development activities take place mainly in the buffer and transition zones					
The site is used for environmental research and monitoring					
There are on-going environmental educational activities in the BR					
Partnerships have been developed with local community stakeholders					
Collaboration with other BRs is taking place					
Local communities participate in management decisions					
Partnerships with experts and research institutions are established					

Comments:

_____

_____

Managing Institution

13) What is the full name of the primary managing institution of your BR (please avoid acronyms)?

_____

14) What year did this institution start managing the BR (since designation by UNESCO)?

_____

15) How many paid staff does this institution currently have?

_____

16) Have you ever carried out a Management Effectiveness Evaluation (MEE) for your BR?

( ) Yes

( ) No, but I am convinced of its importance

( ) No, and I am not sure it's important

( ) No, it's not important

(please explain):_____

IF YOUR ANSWER TO QUESTION 16 IS "NO", GO DIRECTLY TO QUESTION 21

Monitoring

17) For the Management Effectiveness Evaluations (MEE) carried out previously, indicate the Year, the BR Zones Covered, and the Evaluation Tool(s) used (examples below). Use the Comments section if more space is needed.

Examples of MEE tools (*this is not a comprehensive list*):

- Management Effectiveness Tracking Tool - METT

- Rapid Assessment and Prioritization for Protected Area Management - RAPPAM

- Threat Reduction Assessment - TRA

- UNESCO's Periodic Reviews - PR

Note: CZ= Core Zone; BZ= Buffer Zone; TZ= Transition Zone

Evaluation	Year	Zone(s) covered						Tool(s) used
		CZ partial	CZ total	BZ partial	BZ total	TZ partial	TZ total	
MEE 1								
MEE 2								
MEE 3								

Comments:

_____

_____

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CEU eTD Collection

_____

_____

18) The Management Effectiveness Evaluation(s) were carried out by

( ) Internal staff

( ) External expert(s)

( ) Both internal staff and external expert(s)

( ) None of the above

Comments:

_____

_____

_____

_____

19) Did evaluation results have any impact on management plans and/or actions?

( ) Yes

( ) No

Comments:

_____

_____

_____

_____

20) Do you intend to make Management Effectiveness Evaluations a regular practice with your team?

( ) Yes

( ) No

( ) I am not sure

Comments:

_____

_____

_____

_____

About your management effectiveness

21) In your opinion, which best describes the current effectiveness of your BR management?

( ) Clearly inadequate (barely any management taking place)

( ) Basic with major deficiencies (basic management in place with serious problems)

( ) Basic (basic management in place, but can still be significantly improved)

( ) Sound (managed relatively well)

Comments:

_____

_____

22) On a scale from 1 to 5 (1 = highest priority, 3 = medium priority, 5 = lowest priority), please rate the importance of each

of the 6 elements: context, planning, inputs, process, outputs, outcomes, relative to the Management Effectiveness of your BR.

Tick the number corresponding to your rating in the table squares, the same number can be selected more than once

If needed, refer to the definitions of the 6 elements in the below management cycle chart (Hockings *et al.* 2006)

	1	2	3	4	5
Context					
Planning					
Input					
Process					
Output					
Outcomes					

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Context
Status and threats
Where are we
now?

Design / Planning

Planning
Where do we
want to be and
how will we get
there?

Outcomes
What did we
achieve?

Delivery

Evaluation

Outputs
What did we do and
what products or
services were
produced?

Adequacy / Appropriateness

Inputs
What do
we need?

Process
How do we go
about
management?

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Management Evaluation

23) You are about to start the self-assessment of your BR management effectiveness performance. This is a very important part of the survey, the results of which will be shared with you to help orient your management priorities. Please take 10-15 more minutes to complete this part in consultation with other team members.

In the table below, you will find a list of statements that are indicators for management evaluations.

For each indicator, please <u>indicate its importance</u> relative to your BR management effectiveness. Then, on the same row, <u>assign a score over 10</u> reflecting your performance on that same indicator.

Importance rating

Yes = the indicator is relatively important to effective management

No = the indicator is relatively not important to effective management

Performance rating scores can range from 0 to 10, where

0 = no progress

5 = average progress

10 = ideal situation achieved

PLEASE MAKE SURE THAT 2 ANSWERS ARE TICKED ON EACH ROW: ONE FOR "IMPORTANT" AND ANOTHER FOR "PERFORMANCE"

Indicator	Important		Performance rating (score)										
	Yes	No	0	1	2	3	4	5	6	7	8	9	10
Key ecological values are identified and prioritized													
Key cultural values are identified and prioritized													
Potential for sustainable development is identified and prioritized													
Site value for env. research, monitoring and education is identified													
Threats to nominated values are identified and severity evaluated													
Civil and political contexts are favorable to management success													
National authorities and leaders are supportive													
Local community and civil society is supportive													
Core zone(s) are gazetted (designated by law) nationally													
Buffer zone(s) are partially or fully gazetted nationally													
National protected area legislation is inclusive of BRs													
Land use planning authorities account for the BR													
Land ownership status and related issues are well known													
Issues of land tenure are accounted for in planning													
Core zone(s) boundaries are known and demarcated (map, signage)													
Buffer zone(s) boundaries are known and demarcated (map, signage)													
Transition zone boundary is known													
Size and zoning are appropriate to the conservation of significant values													
Size and zoning are adequate to conservation, development & research													
A Management Plan for the BR site is developed and adequate													
Resources needed to reach set management objectives are defined													

Indicator	Important		Performance rating (score)										
	Yes	No	0	1	2	3	4	5	6	7	8	9	10
Management targets specific to the site values are determined													
Indicators to monitor progress towards set targets are developed													
Periodic review and updating of the Management Plan is scheduled													
Staff number is adequate for effective management of the BR													
Staff is adequately allocated to reach management objectives													
Funds necessary to reach set management objectives are available													
Available funds are allocated based on management objectives													
Funds for the achievement of management objectives are secured													
Sustainable financing mechanisms are in place													
Appropriate vehicles, equipment and facilities are available													
Resources for monitoring set indicators and targets are available													
Information needed to adequately manage the site is available													
Governance type of the BR is adequate													
Governance systems are free from corruption													
Leadership is effective and adequate													
Administrative/financial processes are adequate and effective													
Management effectiveness evaluation is undertaken													
Staff meetings are used for learning and adapting													
Maintenance of equipment and infrastructure is adequate													
Training is adequately provided for staff based on needs													
Expertise and skill level of staff and partners are adequate													

Indicator	Important		Performance rating (score)										
	Yes	No	0	1	2	3	4	5	6	7	8	9	10
Management policies and procedures are defined and adequate													
Staff is capable of enforcing policies and laws inside the BR													
Stakeholders are involved in planning and decision-making													
Effective means of communication are used with stakeholders													
An env. awareness and education program is in place													
Community use of natural resources is identified													
Projects and activities of direct community benefit are in place													
Ecotourism visitors are well catered for													
Visitors' impacts on values are controlled													
Activities to conserve natural resources are implemented													
Activities to protect cultural resources are implemented													
Relevant research on natural and cultural values is undertaken													
Condition/trends in the state of biodiversity values are monitored													
Condition/trends in state of cultural values are monitored													
Major threats are monitored and reported													
Planned targets/objectives are being achieved													
Planned outputs of work program are delivered													
Condition of the cultural heritage is well maintained													
Natural integrity and biodiversity values are well conserved													
Threats to nominated values are controlled/reduced													
The BR socio-economically benefits local community													
Env. awareness has increased based on activities													
The site is regularly used for env. research and monitoring													

Comments:

_____

_____

Feedback

24) Please use the space below to give your feedback about the questionnaire and evaluation method, your opinion is highly appreciated (optional).

_____

_____

_____

_____

25) Are you interested to participate in a follow-up study on the case of your BR?

( ) Yes

( ) No

Comments:

_____

_____

_____

_____

26) In future publications, would you agree that the results and name of your Biosphere Reserve

be mentioned explicitly?

( ) Yes, I agree

( ) No, I prefer to keep them confidential

Comments:

_____

_____

_____

_____

Thank You!

Thank you for taking this survey! Your input is highly appreciated and of added value to UNESCO

Biosphere Reserves and conservation in the region.

Appendix 2.3 Survey protocol (French version –translated)

Enquête sur la Gestion des Réserves de Biosphère de l'UNESCO dans les pays Arabes

---

Informations générales

1) A propos de la Réserve de Biosphère (RB)

Nom officiel de la RB : _____

Pays

( ) Algérie

( ) Egypte

( ) Jordanie

( ) Liban

( ) Maroc

( ) Tunisie

( ) Qatar

( ) Soudan

( ) Syrie

( ) Emirats Arabes Unis

( ) Yemen

2) A propos de vous (si vous choisissez l'anonymat, votre adresse Email peut suffire)

Prénom: _____

Nom de famille: _____

Adresse Email*: _____

Numéro de téléphone fixe (avec code du pays): _____

Numéro de téléphone portable (avec code du pays): _____

3) Quelle est votre fonction officielle au sein de la réserve de biosphère? Veuillez mentionner brièvement vos responsabilités.

_____

_____

_____

_____

4) Dans le tableau ci-dessous, veuillez indiquer tous les classements nationaux et internationaux de ce site, incluant celui de «Réserve de Biosphère» de l'UNESCO.

Pour chaque classement, veuillez indiquer l'année correspondante, le titre officiel, la zone concernée, et si le classement est statutaire (établi dans la législation nationale) ou PAs.

Note: CZ (Core Zone) = zone/aire centrale ; BZ (Buffer Zone)= zone tampon ; TZ (Transition Zone) = zone de transition.

Année	Classement	Zones concernées (cocher toutes les cases qui correspondent)						Statutaire	
		CZ partiel	CZ total	BZ partiel	BZ total	TZ partiel	TZ total	Oui	Non
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]		
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]		
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]		
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]		
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]		

5) Classer de 1 à 5, par ordre de priorité, ce que vous pensez qu'une Réserve de Biosphère de l'UNESCO est créée

pour (le 1 indique la priorité la plus élevée).

Le même classement/nombre ne peut être sélectionné plus d'une fois !

_____Conservation des valeurs naturelles

_____Education à l'environnement

_____Recherche et surveillance de l'environnement

_____Préservation du patrimoine culturel

_____Développement durable

6) Quel genre d'établissement gère actuellement votre Réserve de Biosphère?

( ) Organisation Non-Gouvernementale (ONG)

( ) Institution gouvernementale

( ) Entité privée

( ) Communauté(s) locale(s)

( ) Elle est cogérée; veuillez indiquer par quels genres d'institutions et leurs responsabilités respectives:

_____

_____

_____

_____

7) Comment décririez-vous votre communication avec le comité national pour le programme "Man and Biosphere" (MAB)?

( ) Bonne

( ) Moyenne

( ) Faible

8) Veuillez décrire votre relation de travail avec les institutions national, régional et international de UNESCO-MAB, en ce qui concerne la gestion de votre RB.

_____

_____

_____

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_____

_____

_____

_____

_____

_____

_____

_____

_____

9) Votre institution a-t-elle été contactée auparavant pour une étude régionale ou internationale concernant la gestion des réserves de biosphère?

( ) Non

( ) Je ne sais PAs

( ) Oui; veuillez fournir une référence de l'institution et/ou le nom de l'étude: _____

_____

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10) Est-ce que votre RB possède actuellement une gestion opérationnelle?

Une gestion opérationnelle implique la présence d'un minimum de personnel, un programme de travail (activités, plans, projets), et un budget, consacrés à la gestion de la RB.

( ) Oui

( ) Non

Commentaires:

_____

_____

_____

SI VOTRE REPONSE CI-DESSUS EST "NON" ALLER DIRECTEMENT A LA QUESTION 24

Implémentation de la Réserve de Biosphère

11) Classer les activités ci-dessous de 1 à 5, du plus (1) au moins (5) appliqué dans votre RB. Le même classement/nombre ne peut être sélectionné plus d'une fois !

_____Conservation des valeurs naturelles

_____Education à l'environnement

_____Recherche et surveillance de l'environnement

_____Préservation du patrimoine culturel

_____Développement durable

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12) Sélectionner la réponse la plus pertinente aux déclarations ci-dessous

	Tout à fait d' accord	D'accord	PAs d'accord	PAs du tout d'accord	Non applicable
Les 3 zones (centrale, tampon, transition) sont bien délimitées et précises					
Bien que classé RB, le site est seulement géré en tant que aire protégée selon le classement nationale					
Le plan de gestion détermine les stratégies et les actions pour chaque zone					
Les activités de conservation des valeurs naturelles ont lieu principalement dans la zone centrale					
Les activités de développement durable ont lieu principalement dans la zone tampon et la zone de transition					
Le site est utilisé pour la recherche et la surveillance de l'environnement					
Des activités d'éducation à l'environnement sont en cours dans la RB					
Des partenariats ont été établis avec les intervenants communautaires locaux					
Une collaboration se produit avec d'autres RB					
Les communautés locales participent aux décisions de gestion					
Des partenariats avec des experts et des institutions de recherche sont établis					

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Commentaires:

_____

_____

_____

_____

Institution de gestion

13) Quel est le nom de la principale institution de gestion de votre Réserve de Biosphère (éviter les acronymes)?

_____

14) En quelle année cette institution a-t-elle commencé à gérer la RB (à partir de son classement par l'UNESCO)?

_____

15) Combien d'employés rémunérés comporte actuellement cette institution ?

_____

16) Avez-vous jamais effectué une évaluation de l'efficacité de la gestion dans votre RB ?

( ) Oui

( ) Non, mais je suis convaincu de son importance

( ) Non, et je ne suis PAs convaincu de son importance

( ) Non, ce n'est PAs important (veuillez expliquer): _____

SI VOTRE REPONSE A LA QUESTION 16 EST "NON", ALLER DIRECTEMENT A LA QUESTION 21

Suivi de l'efficacité de la gestion

17) Concernant les évaluations de l'efficacité de la gestion menées précédemment, indiquer l'année, les zones de RB couvertes et les outils d'évaluation utilisés (exemples ci-dessous). Utiliser la section de « commentaires » pour compléter vos réponses si besoin en est.

Exemples d'outils d'évaluation:

1) Instrument de suivi de l'efficacité de la gestion des aires protégées (Management Effectiveness Tracking Tool / METT)

2) Evaluation rapide et priorités pour la zone protégée (Rapid Assessment and Prioritization for Protected Area Management/ RAPPAM)

3) Evaluation de la réduction de la menace (Threat Reduction Assessment / TRA)

4) Examen périodique de l'UNESCO (Periodic Report / PR).

Note: CZ = zone centrale ; BZ = zone tampon ; TZ = zone de transition

Evaluation	Année	Zone(s) couverte(s)						Outils utilisés
		CZ partiel	CZ total	BZ partiel	BZ total	TZ partiel	TZ total	
1								
2								
3								

Commentaires:

_____

_____

_____

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18) L'évaluation de l'efficacité de la gestion a été effectuée par

( ) Le personnel interne

( ) Un (ou plusieurs) expert externe

( ) Le personnel interne avec un (ou plusieurs) expert externe

( ) Aucune des réponses précédentes

Commentaires:

_____

_____

_____

_____

19) Les résultats de l'évaluation ont-ils eu un impact sur les plans de gestion et/ou sur les actions?

( ) Oui

( ) Non

Commentaires:

_____

_____

_____

_____

20) Avez-vous l'intention de faire avec votre équipe une pratique régulière de l'évaluation de l'efficacité de la gestion ?

( ) Oui

( ) Non

( ) Je ne sais PAs

Commentaires:

_____

_____

_____

_____

Au sujet de l'efficacité de la gestion

21) A votre avis, quelle description correspond le mieux à l'efficacité de la gestion actuelle de votre RB ?

( ) Nettement inadéquate (à peine y-a-t-il gestion)

( ) Elémentaire avec d'importantes insuffisances (gestion élémentaire en place avec de sérieux problèmes)

( ) Elémentaire (gestion élémentaire en place mais pourrait être nettement meilleure)

( ) Solide (relativement bien gérée)

	1	2	3	4	5
Contexte					
Planification					
Entrées					
Processus					
Sorties					
Résultats					

Commentaires:_____

_____

_____

_____

22) Sur une échelle de 1 à 5 (1 = priorité la plus élevée, 3 = priorité moyenne, 5 = faible priorité), veuillez évaluer l'importance de chacun de ces 6 éléments relativement à l'efficacité de la gestion de votre RB : Contexte, Planification, Entrées, Processus, Sorties, Résultats.

Dans le tableau, cocher la case correspondante a l'ordre de priorite voulu sachant que 2 éléments peuvent avoir le meme classemement!

Explication des 6 éléments:

(1) Contexte (la situation actuelle): menaces et cadre socio-politique

(2) Planification (la situation recherchée): planification de l'aire protegée

(3) Entrées (les besoins): ressources nécessaires

(4) Processus (les moyens): mode de gestion

(5) Sorties (les effets): mise en oeuvre des programmes de gestion, produits et services fournis

(6) Résultats: résultats et leur contribution aux objectifs

Evaluation de l'efficacité de la gestion

23) Vous êtes sur le point de commencer l'auto-évaluation de la performance de votre efficacité de la gestion de votre RB. C'est une partie très importante de l'enquête, dont les résultats seront partagés avec vous pour vous aider à orienter vos priorités de gestion. S'il vous plaît prendre 10-15 minutes de plus pour terminer cette partie en consultation avec d'autres membres de l'équipe.

Dans le tableau ci-dessous, vous trouverez une liste d'énoncés qui sont des indicateurs pour l'évaluation de la gestion. Pour chaque indicateur, s'il vous plaît indiquer son <u>importance</u> par rapport à l'efficacité de votre gestion de la RB. Puis, sur la même rangée, attribuer un score sur 10 qui reflète <u>votre performance</u> sur ce même indicateur.

Cote d'importance :

Oui = indicateur important pour l'efficacité de la gestion,

Non= indicateur de faible importance pour l'efficacité de la gestion

Scores pouvant varier de 0 à 10, tels que :

0 = aucun progrès

5 = progression moyenne

10 = objectifs atteints

S'ASSURER DE COCHER 2 REPONSES PAR RANGEE (IMPORTANT & PERFORMANCE) !

Indicateur	Important		Performance (votre score)										
	Oui	Non	0	1	2	3	4	5	6	7	8	9	10
Les valeurs écologiques clés sont identifiées et priorisées													
Les valeurs culturelles clés sont identifiées et priorisées													
Les possibilités d'un développement durable sont identifiées et priorisées													
La valeur du site pour la recherche sur l'environnement, la surveillance et l'éducation, est identifiée													
Les menaces à ces valeurs sont identifiées et évaluées													
Le contexte civil et politique est favorable à la réussite de la gestion													
Les autorités nationales et les dirigeants offrent leur soutien													
Les collectivités locales et la société civile offrent leur soutien													
La zone centrale est protégée par la législation nationale													
La zone tampon est partiellement ou complètement protégée par la législation nationale													
La législation nationale pour les aires protégées s'applique aux RBs													
Les autorités responsables de la planification et aménagement du territoire tiennent compte de la RB													
La propriété foncière et les questions qui y sont reliées ont un statut bien défini													
Les questions de propriété foncière sont prises en considération dans la planification de la gestion													
La (ou les) zone centrale a des frontières connues et bien délimitées													
La zone tampon a des frontières connues et délimitées (cartes, signalisation…)													
Les frontières de la zone de transition sont connues													

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Indicateur	Important		Performance (votre score)										
	Oui	Non	0	1	2	3	4	5	6	7	8	9	10
La superficie et le zonage conviennent à la conservation de valeurs importantes													
La superficie et le zonage sont adéquats à la conservation, au développement et à la recherche													
Un plan de gestion du site de RB est développé et adéquat													
Les ressources nécessaires pour atteindre les objectifs fixés par la gestion sont définies													

Indicateur	Important		Performance (votre score)										
	Oui	Non	0	1	2	3	4	5	6	7	8	9	10
Les objectifs de la gestion spécifiques aux valeurs de ce site, sont déterminés													
Les indicateurs qui évaluent le progrès vers les objectifs fixés, sont développés													
Une révision périodique et une mise à jour du plan de gestion, sont prévues													
Le personnel est en nombre adéquat pour une gestion efficace de la RB													
L'équipe est convenablement répartie pour atteindre les objectifs													
Les fonds nécessaires pour atteindre les objectifs fixés par la gestion sont disponibles													
Les fonds disponibles sont attribués selon les objectifs de la gestion													
Les fonds nécessaires à la réalisation des objectifs de la gestion sont assurés													
Les mécanismes de financement durable sont en place													
Les véhicules appropriés, le matériel et les installations sont disponibles													
Les ressources de suivi pour l'ensemble des indicateurs et des objectifs sont disponibles													
Les informations nécessaires pour gérer convenablement le site sont disponibles													
La forme de gouvernance de la RB est adéquate													
Les systèmes de gouvernance ne sont PAs corrompus													
Les leaders sont efficaces et compétents													
Les procédés administratifs et financiers sont adéquats et efficaces													
L'évaluation de l'efficacité de la gestion est assumée													
Les réunions de l'équipe servent à apprendre et à remettre à jour plans et actions													
L'entretien des équipements et des infrastructures est adéquat													
Une formation adéquate du personnel est prévue selon les besoins													
Le niveau d'expérience et de compétence du personnel et des partenaires est adéquat													

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Indicateur	Important		Performance (votre score)										
	Oui	Non	0	1	2	3	4	5	6	7	8	9	10
Les politiques et les procédures de gestion sont définies et adéquates													
Le personnel est capable d'imposer les politiques et lois a l'intérieur de la RB													
Les parties prenantes participent activement à la planification et aux prises de décisions													
Des moyens de communication efficaces sont mis en place avec les parties prenantes													
Un programme d'éducation à l'environnement et de connaissances est mis en place													
Les communautés locales ont un usage bien défini des ressources naturelles													
Des projets et des activités sont organisés au bénéfice des communautés locales													
Les visiteurs de l'éco-tourisme sont pris en charge													
Les répercussions des visiteurs sur les valeurs, sont sous contrôle													
Des activités pour conserver les ressources naturelles sont réalisées													
Des activités pour protéger les ressources culturelles sont réalisées													
Une recherche pertinente des valeurs naturelles et culturelles est entreprise													
Les tendances dans l'état des valeurs de la biodiversité sont sous surveillance													
Les tendances dans l'état des valeurs culturelles sont sous surveillance													
Indicateur	**Important**		**Performance (votre score)**										

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	Oui	Non	0	1	2	3	4	5	6	7	8	9	10
Les menaces importantes sont surveillées et signalées													
Les objectifs prévus sont réalisés													
Les sorties (produits) planifiés selon le plan de travail, sont livrés													
L'héritage culturel est conservé en bonne condition													
La nature dans son intégrité et les valeurs de la biodiversité sont bien conservées													
Les menaces aux valeurs nommées sont détectées et éliminées													
La RB procure des bénéfices socio-économiques aux communautés locales													
L'éveil à l'environnement s'est accru grâce aux activités													
La RB est régulièrement utilisée pour les recherches environnementales et la surveillance													

Commentaires:

_____

_____

Vos réactions et votre opinion

24) Veuillez employer cet espace pour donner votre avis sur ce questionnaire et la méthode d'évaluation ci-dessus, votre opinion sera hautement appréciée (facultatif).

_____

_____

_____

_____

25) Aimerez-vous participer à un suivi d'étude concernant votre RB ?

( ) Oui

( ) Non

Commentaires:

_____

_____

_____

_____

26) Dans les publications futures, accepteriez-vous que les résultats et le nom de votre réserve de biosphère soit explicitement mentionné?

( ) Oui, j'accepte

( ) Non, je préfère les garder confidentiels

Commentaires:

_____

_____

_____

_____

Remerciements!

Merci d'avoir rempli cette enquête, votre temps et vos efforts sont hautement appréciés et sont une valeur ajoutée à la recherche sur les réserves de biosphère de l'UNESCO et la conservation dans la région.

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Appendix 2.4 Survey protocol (Arabic version-translated)

<div dir="rtl">

معلومات عامة

اسم محمية المحيط الحيوي: _____

البلد

( ) الجزائر

( ) مصر

( ) الأردن

( ) لبنان

( ) المغرب

( ) تونس

( ) قطر

( ) السودان

( ) سوريا

( )الامارات العربية المتحدة.

( ) اليمن

2.معلومات شخصية (يمكنك أن تبقى مجهولا. لا يطلب منك الا البريد الالكتروني)

الاسم: _____

الشهرة: _____

البريد الالكتروني: _____

</div>

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_____ رقم الهاتف (الرجاء تضمين رمز البلد)

_____رقم الخلوي (الرجاء تضمين رمز البلد)

3.ما هو نوع عملك في ما يتعلق بمحمية المحيط الحيوي؟ تكلم باختصار عن مسؤولياتك.

_____

_____

_____

_____

4. في الجدول الوارد أدناه، الرجاء الاشارة الى كافة التعيينات الوطنية والدولية لهذا الموقع بما فيها محمية اليونسكو للمحيط الحيوي.

لكل تعيين الرجاء الاشارة الى السنة المطابقة والصفة الرسمية والمنطقة أو المناطق المغطاة، سواء أكان هذاالتعيين قانونيا" أو لا.

ملاحظة: المنطقة الأساسية(Core area)

المنطقة العازلة   (Buffer zone)

المنطقة الانتقالية   (Transition zone)

272

السنة	التعيين	المناطق المغطاة (ضع علامة على كل ما هو مطابق)						قانوني	
		المنطقة الأساسية جزئي	المنطقة الأساسية كامل	المنطقة العازلة جزئي	المنطقة العازلة كامل	المنطقة الانتقالية جزئي	المنطقة الانتقالية كامل	نعم	لا
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

5. رتب من 1 الى 5 من حيث الأولوية في ما يتعلق برأيك حول سبب وجود محميات **اليونسكو للمحيط الحيوي** (الرقم 1 يشير الى الأولوية). *لا يمكن اختيار الرقم نفسه أكثر من مرة واحدة.*

المحافظة على القيم الطبيعية_____

التربية البيئية_____

البحث البيئي و المراقبة_____

حماية الارث الثقافي_____

التنمية المستدامة_____

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6. أي نوع من المؤسسات تدير حالياً محمية المحيط الحيوي خاصتكم ؟

( ) منظمة غير حكومية

( ) مؤسسة حكومية

( ) مؤسسة خاصة

( ) أسر محلية

( ) في حال كانت ادارة مشتركة، الرجاء الاشارة الى أنواع المؤسسات والمسؤوليات الخاصة بها:

_____

_____

_____

_____

7. كيف تصف تواصلك بلجنة ال"ماب" الوطنية التابعة لليونسكو (Man and Biosphere)؟

( ) جيدة

( ) وسط

( ) ضعيفة

8. الرجاء وصف علاقتك بمؤسسات ال "ماب" المحلية والاقليمية والدولية التابعة لليونسكو:

_____

_____

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9. هل سبق أن شاركت شخصيا" أو بواسطة المؤسسة التابع لها دراسة" اقليمة أو دولية حول ادارة محمية المحيط الحيوي؟

كلا ( )

لا أعرف ( )

نعم، الرجاء تزويدنا بمرجع المؤسسة أو إسم الدراسة: ( )

_____

_____

10. هل لمحمية المحيط الحيوي خاصتكم حاليا" ادارة تنفيذية؟

تشير الادارة التنفيذية الى وجود الحد الأدنى من الموظفين ونظام عمل (لنشاطات وخطط ومشاريع) والميزانية الهادفة لادارة محمية المحيط الحيوي.

نعم ( )

كلا ( )

275

التعليق:

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_____

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في حال كان جوابكم كلا توجهوا فورا" الى السؤال رقم 24

تطبيق محمية المحيط الحيوي

11. رتب المصطلحات من 1 الى 5 مشيراً الى 1 (الأكثر تطبيقاً) وصولاً الى 5 (الأقل تطبيقاً) في محمية المحيط الحيوي خاصتكم. لا يمكن اختيار الرقم نفسه أكثر من مرة واحدة.

المحافظة على القيم الطبيعية_____

التربية البيئية_____

البحث البيئي و المراقبة_____

حماية الارث الثقافي_____

التنمية المستدامة_____

12. الرجاء اختيار الجواب الأنسب للجمل التالية.

غير مطابق	لا أوافق البتة	لا أوافق	أوافق	أوافق بالكامل	
					ان المناطق الثلاثة (الأساسية والعازلة والانتقالية) مرسومة و معرف عنها بشكل جيد
					على الرغم من تسميتها محمية المحيط الحيوي، تتم ادارة هذا الموقع كونه منطقة مراقبة على أساس التعيينات المحلية
					تحدد الخطة الادارية الاستراتيجيات و الأعمال الخاصة بكل منطقة
					تتم نشاطات حماية القيم الطبيعية بشكل أساسي في المنطقة الأساسية
					تتم نشاطات التنمية المستدامة والرفيقة للبيئة بشكل أساسي في المناطق العازلة و الأساسية
					يستعمل الموقع للبحث البيئي و المراقبة
					هنالك نشاطات تربوية بيئية مستمرة في محمية المحيط الحيوي
					لقد تمت الشراكة مع أصحاب المصالح المحلية
					اقامة تعاون مع محميات المحيط الحيوي
					تشارك الأسر المحلية في اتخاذ قرارت ادارية
					تم اقامة الشراكة مع الخبراء والمؤسسات المعنية باقامة البحوث

277

التعليق:

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المؤسسة الادارية

13. ما هو الاسم الكامل للمؤسسة الادارية الاولية لمحمية المحيط الحيوي خاصتكم؟ (الرجاء عدم استعمال الاختصارات)

_____

14. في أي سنة بدأت هذه المؤسسة بادارة محمية المحيط الحيوي(منذ تعيينها من قبل اليونسكو)

_____

15. كم هو عدد الموظفين الذين يتقاضون راتبا" في هذه المؤسسة؟

_____

16. هل سبق و قمت بتقييم لفعالية ادارة المحمية للمحيط الحيوي خاصتكم؟

( ) نعم

( ) كلا و لكني لست مقتنعا" بأهميتها

( ) كلا و لكني لست متأكدا" أنها مهمة

( ) كلا وهي ليست مهمة (الرجاء التفسير)

في حال كان جوابك كلا في السؤال رقم 16 الرجاء التوجه مباشرة" الى السؤال رقم 21

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<u>المراقبة</u>

في ما يتعلق بتقييم فعالية الادارة التي أقيمت مسبقا" الرجاء تحديد السنة ومناطق محمية المحيط الحيوي المغطاة وأداة التقييم المستعملة (الأمثلة الواردة أدناه) . *استعمل قسم التعليق في حال كنت بحاجة لمزيد من المسافة.*

أمثلة عن أدوات تقييم فعالية الادارة *(ليست هذه لائحة شاملة)*:

أداة تتبع فعالية الادارة

-(Management Effectiveness Tracking Tool / METT)

التقييم السريع و اعطاء الأولوية لادارة المنطقة المحمية

(Rapid Assessment and Prioritization for Protected Area Management/ RAPPAM)-

(Threat Reduction Assessment / TRA)تقارير حول تقييم تقليص المخاطر-

-(Periodic Report / PR)المراجعة الدورية من قبَل اليونسكو

التقييم	السنة	المناطق المغطاة (ضع علامة على كل ما هو مطابق)						الأدوات المستعملة
		المنطقة الأساسية جزئي	المنطقة الأساسية كامل	المنطقة العازلة جزئي	المنطقة العازلة كامل	المنطقة الانتقالية جزئي	المنطقة الانتقالية كامل	
1		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	
2		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	
3		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	

التعليق:

_____

_____

_____

18. لقد قام بتقييم فعالية الادارة:

( ) طاقم العمل الداخلي

( ) خبراء خارجيون

( ) كل من طاقم العمل الداخلي والخبراء الخارجيين

( ) لا أحد منهم

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التعليق:

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19. هل كان لأي من نتائج التقييم أثر على مخططات الادارة أو أعمالها؟

نعم ( )

كلا ( )

التعليق:

_____

_____

_____

_____

20. هل أردت أن يصبح تقييم فعالية الادارة أمرا" منتظما" مع فريقك؟

نعم ( )

كلا ( )

لست متأكدا" ( )

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التعليق:

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حول فعالية ادارتكم

21. برأيك، أي من المصطلحات التالية تجيد وصف الفعالية الحالية لادارة محمية المحيط الحيوي الخاصة بكم؟

( ) غير ملائمة (بالكاد هنالك القليل من الادارة)

( ) أساسية مع بعض الشوائب(ادارة أساسية مع وجود مشاكل كبيرة)

( ) أساسية (ادارة أساسية و لكن من المفترض تحسينها بشكل ملحوظ)

( ) صائبة (ادارة جيدة نسبيا")

التعليق:

_____

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22. على مقياس من 1 الى 5 (1= الأولوية الأعلى، 3=أولوية متوسطة،5=أولوية ادنى) الرجاء تصنيف العناصر الستة التالية : المضمون ، التخطيط، الطاقة المزودة، سير العمل، الحصيلة والانتاجية.

ضع علامة" تحت الرقم المناسب في المربعات. يمكنك استعمال الرقم نفسه أكثر من مرة.

في حال دعت الحاجة، الرجاء الرجوع الى تعريفات العناصر الستة في ميثاق عجلة الادارة الوارد أدناه (هوكنجز 2006)
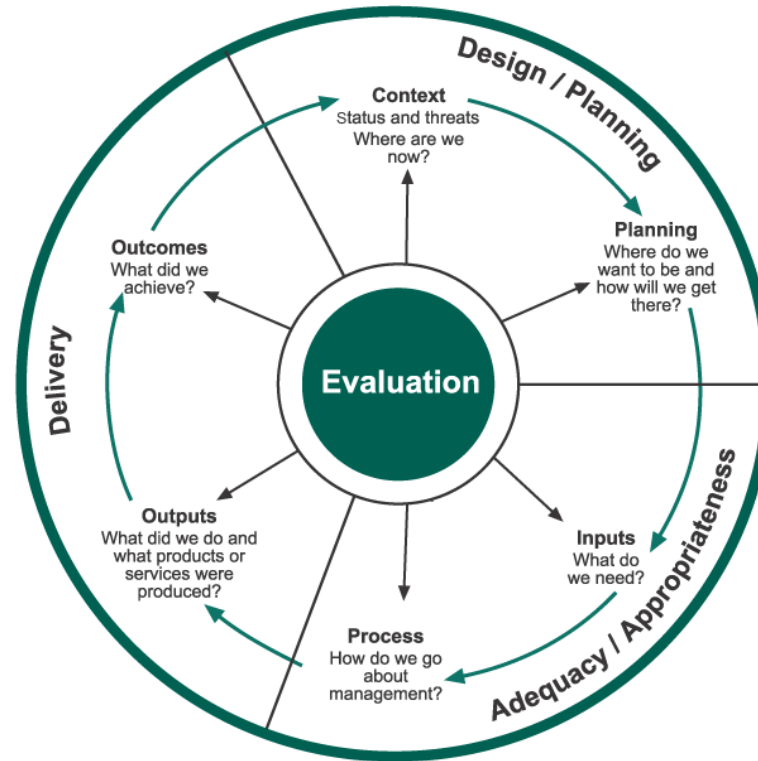
	5	4	3	2	1	
						المضمون
						التخطيط
						الطاقة المزودة
						سير العمل
						الحصيلة
						الانتاجية

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<u>تقييم الادارة</u>

23. انك على وشك أن تبدأ تقييما" ذاتيا" لأداء فعالية ادارة محمية المحيط الحيوي الخاص بكم. انه قسم مهم من هذه الدراسة حيث أن نتائج هذا البحث سوف تستخدم لمساعدتكم في توجيه أولويات الادارة. الرجاء أخذ 10الى 15 دقيقة لاتمام هذا القسم وذلك من خلال استشارة باقي أعضاء هذا الفريق.

سوف تجد في الجدول أدناه لائحة جمل تكون بمثابة مؤشرات لتقييم الادارة.

لكل مؤشر، الرجاء الاشارة الى أهميته بالنسبة الى فعالية ادارة محمية المحيط الحيوي الخاص بكم. و من ثم وعلى الصف ذاته ضع علامة" على 10 تعكس اداءكم على المؤشر ذاته.

تصنيف الأهمية / مهم

نعم= ان المؤشر مهم نسبيا" لادارة فعالة

كلا= ان المؤشر غير مهم نسبيا" لادارة فعالة

يمكن أن تتراوح علامات تصنيف الأداء من صفر الى 10

صفر= لا تقدم

5= تقدم وسطي

10= الوصول الى الحالة المثالية

الرجاء التأكد من وضع اشارة تحت ايجابتين في كل صف: واحدة للأهمية وأخرى للأداء

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المؤشر	مهم		علامة الأداء											
	نعم	كلا	0	1	2	3	4	5	6	7	8	9	10
تحديد القيم الايكولوجية و اعطاءالاولوية لها														
تحديد القيم الثقافية و اعطاء الأولوية لها														
تحديد امكانية التنمية المستدامة و اعطاء الاولوية لها														
تحديد قيمة الموقع للبحث البيئي و المراقبة و التربية														
تحديد المخاطر على القيم المسماة و تقييمها بصرامة														
الاطاران المدني و السياسي مؤاتيان لنجاح الادارة														
دعم السلطات الوطنية والقيادات														
دعم الأسر المحلية والمجتمع المدني														
نشر المنطقة \ المناطق الأساسية قانونيا" على الصعيد الوطني														
نشر المنطقة \ المناطق العازلة قانونيا"، بالكامل أو جزئيا"، على الصعيد الوطني														
تشريع منطقة محمية وطنية هو جزء من محمية المحيط الحيوي														
ترفع سلطات تخطيط استعمال الأراضي تقاريرها لمحمية المحيط الحيوي														
يكون وضع ملكية الأراضي و المسائل المتعلقة بها أمرا" معروفا" و واضحا"														
يتم الاخبار عن حيازة الأراضي بهدف التخطيط														
ترسيم حدود المناطق الأساسية (خرائط و لافتات)														
ترسيم حدود المناطق العازلة (خرائط و لافتات)														
التعريف عن حدود المنطقة الانتقالية														
ملاءمة حجم و تحديد المناطق مع المحافظة على القيم البارزة														
ملاءمة حجم و تحديد المناطق مع المحافظة والتنمية المستدامة والبحث														
تصميم و ملاءمة خطة ادارية لموقع المحمية للمحيط الحيوي														
تحديد الموارد اللازمة للوصول الى أهداف الادارة المنشودة														

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المؤشر	مهم		علامة الأداء											
	نعم	كلا	0	1	2	3	4	5	6	7	8	9	10	
تحديد أهداف الادارة الخاصة بقيم الموقع														
تنمية المؤشرات لمراقبة تطور الأهداف المنشودة														
جدولة الملحق الدوري و تحديث مخطط الادارة														
تلاؤم عدد الموظفين مع فعالية ادارة محمية المحيط الحيوي														
تخصص الموظفين المناسبين للوصول الى أهداف الادارة المنشودة														
توافر الأموال اللازمة لتحقيق أهداف الادارة المنشودة														
تخضيض الأموال المتوافرة بناء" على أساس أهداف الادارة														
تأمين الأموال لتحقيق أهداف الادارة														
وجود آليات تمويلية مستدامة														
توافر وسائل نقل مناسبة ومعدات ومراكز														
توافر الموارد لمراقبة المؤشرات والأهداف المحددة														
توافر معلومات لادارة الموقع بشكل ملائم														
تلاؤم نوع السلطة الادارية لمحمية المحيط الحيوي														
أجهزة السلطة الادارية خالية من الفساد														
فعالية و ملاءمة القيادة														
تلاؤم وفعالية العمليات الادارية والمالية														
القيام بتقييم فعالية الادارة														
عقد اجتماعات للموظفين بهدف التعليم والتأقلم														
تلاؤم صيانة المعدات والبنى التحتية														
تزويد الموظفين بالتدريب الملائم حسب ما تدعو الحاجة														
تلاؤم الخبرات ومستوى مهارة الموظفين والشركاء														

المؤشر	مهم		علامة الأداء										
	نعم	كلا	0	1	2	3	4	5	6	7	8	9	10
تحديد و تلاؤم سياسات الادارة و اجراءاتها													
قدرة الموظفين على تطبيق السيسات والقوانين داخل محمية المحيط الحيوي													
ان أصحاب المصالح معنية بالتخطيط و اتخاذ القرارات													
استعمال وسائل الاتصال الفعالة بين أصحاب العمل													
وجود توعية بيئية و برنامج تربوي													
تحديد استعمال الأسر المحلية للموارد الطبيعية													
وجود مشاريع و نشاطات ذات منفعة مباشرة للأسر المحلية													
الاهتمام بزوار السياحة البيئية بشكل جيد													
مراقبة وقع الزوار على القيم الايكولوجية والثقافية													
تطبيق النشاطات لحماية الموارد الطبيعية													
تطبيق النشاطات للمحافظة على الموارد الثقافية													
القيام بابحاث حول القيم الطبيعية و الثقافية													
مراقبة الظروف أو الاتجاهات في ما يتعلق بقيم التنوع البيولوجي													
مراقبة الظروف أو الاتجاهات في ما يتعلق بالقيم الثقافية													
مراقبة المخاطر المهمة و رفع التقارير بشأنها													
تحقيق الأهداف المخطط لها													
تأمين انتاجية برنامج عمل مخطط له													
المحافظة على ظروف الارث الثقافي													
حماية السلامة الطبيعية وقيم التنوع البيولوجي													
مراقبة المخاطر على القيم المسماة و تقليصها													
محمية المحيط الحيوي تقدّم المنافع الاجتماعية والاقتصادية للأسر المحلية													
زيادة التوعية البيئية في منطقة المحمية لاعتمادها على النشاطات													
استعمال الموقع بشكل منتظم للقيام بالأبحاث البيئية والمراقبة													

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التعليق

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التعليق:

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ردود الفعل

24. الرجاء استعمال المسافة ادناه لتزويدنا بردة فعلكم حول الاستطلاع وطريقة التقييم. ان رأيكم يمهمنا جدا" (اختياري)

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25. هل ترغب بالمشاركة في دراسة متابعة حول محمية المحيط الحيوي الخاصة بكم؟

( ) نعم

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( ) **كلا**

التعليق:

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26. في النشرات اللاحقة، هل توافق أن تكون النتائج واسم محمية المحيط الحيوي الخاص بكم مذكورا" بصراحة؟

( ) نعم أوافق
( ) كلا أفضل أن أترك إسم المحمية سرياً

التعليق:

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شكرا" لمشاركتكم بهذه الدراسة. إن المعلومات التي زودتمونا بها هي بغاية الأهمية وتضيف قيمة على محميات اليونسكو للمحيط الحيوي والمحافظة على الموارد الطبيعية في المنطقة.

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Appendix 3: In-depth interview protocol

Section 1: Unstructured

Questions were not exactly similar for the different interviewees; they included (but were not limited to):

1- What do you think of the results obtained through the self-assessment?

2- In general how is the MAB program implemented in your country? And what are the main problems faced?

3- What is your vision of a functional/ideal situation for MAB in your country?

4- What is in your opinion the value of the MAB program?

5- What do you think is the main determining factor of success for BRs/MAB in your country?

Section 2: Structured

Which of the following are determining factors of success in your country?/ **Parmi les facteurs ci-dessous, quels sont les plus determinants du success des RBs dans votre pays?**			Explain/ **Elaborer**
Management activities/Activites liees a la gestion	**Yes/Oui**	**No/Non**	
Rural regional development measures/ Mesures de development rural locales			[adjustable space]
Environmental education/ Education a l'environnement			
Research and monitoring (long-term)/ Recherche et surveillance (long-terme)			
Locally adapted involvement of the population/ Implication adaptee des communautes locales			
Practical nature conservation measures like reforestation or the fight against erosion/ Mesures de conservation pratiques comme la reforestation ou combattre l'erosion			
Evaluation for an adaptive management/ Evaluation pour une gestion adaptative			
Good working relations and cooperation with authorities/ Bonnes relations de cooperation avec les autorites			
Law enforcement (inter alia use of sanctions)/ Application des lois (sanctions ou citations)			
Leadership/ "Leadership"			
Sufficient (qualified) staff in the BR/ Nombres suffisants de staff (qualifies) pour la gestion de la RB			

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Which of the following are determining factors of success in your country?/ **Parmi les facteurs ci-dessous, quels sont les plus determinants du success des RBs dans votre pays?**			Explain/ **Elaborer**
Governance factors/Facteurs lies a la gouvernance	**Yes/Oui**	**No/Non**	
Political support at the regional level/ Soutien polique au niveau regional			
Appropriate funding (amounts and sustainability)/ Financement appropries (sommes et durabilite)			
Absence of corruption/ Absence de corruption			
Modern nature conservation programs and laws/ Modernisation des lois et programmes de conservation			
Absence of counterproductive and competing governmental programs/ Absence de programmes competitifs et contre-productifs au niveau du gouvernement			
Adequate institutional design; precise distribution of responsibilities between authorities/ Design approprie des institutions en charge et une distribution claire des responsabilites			
Compensation for use restrictions/ Compensation pour les restrictions d'usage			
Clear demarcation of borders (for the 3 zones)/ Demarcation des frontieres ou limites de la RB (pour les 3 zones)			
Local communities supporting the BR/ Les communautes locales soutiennent la RB			

Which other factors - not mentioned above- also determine BR success in your country?/ Quels autres facteurs determinants le succes de la RB dans votre pays n'ont PAs ete mentionnes ci-dessus?			Explain/ Elaborer
Management activities/Activites liees a la gestion	Yes/Oui	No/Non	
Governance factors/Facteurs lies a la gouvernance	Yes/Oui	No/Non	