

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.



MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA

UNIVERSITY OF NEW ZEALAND

Comparative analysis of four international
methodologies used to evaluate protected area
management effectiveness

A thesis presented in partial fulfilment of the requirements for the degree
of Master of Environmental Management at Massey University,
New Zealand

Dorianne Sofía Anzueto-Pellecer

15006013

2016

Abstract

Around the world, protected areas have been created with the objective of conserving natural and cultural heritage. To monitor how effectively this objective is being achieved, the Convention on Biological Diversity (CBD) and its Programme of Work on Protected Areas (PoWPA) proposed that periodical evaluations of the management of protected areas should be conducted. These evaluations have the objective of monitoring improvements or deteriorations of the management of the PAs and their conservation outputs and outcomes. They can be carried out using different methodologies, widely referred to as protected area management effectiveness evaluations (PAMEs). In 2000, the International Union for Conservation of Nature (IUCN) established a framework to guide the creation of PAME methodologies. Based on this framework several methodologies have been developed around the world. However, they all focus on evaluating different aspects of management, producing different types of results. Previous studies describing these methodologies have been conducted, but an in depth comparative analysis has not yet been published.

This thesis seeks to conduct a comprehensive analysis to compare the fundamental characteristics of four of the most commonly used PAME methodologies: the Management Effectiveness Tracking Tool (METT), the Rapid Assessment and Prioritization of Protected Area Management (RAPPAM), the Enhancing our Heritage Toolkit (EoH), and the Site Consolidation Scorecard (SCS). Content analysis was used to compare and contrast these four PAME methodologies. Categories based on the IUCN's framework for the creation of PAMEs were used to organise and compare the indicators used by each

methodology. The quantities and characteristics of the indicators were assessed to identify their viability, similarities and differences. The aim was to build upon the current literature to inform potential users about the different approaches these methodologies take, and to help them make an informed decision about which one to use.

It was found that the four methodologies evaluate different themes, elements and criteria thereby generating different types of information regarding protected area management. They also use different levels of detail in their indicators and need different sources of information to be completed. It was also found that all four methodologies are weak in assessing the delivery of protected area objectives, they predominately use ordinal approaches to assess indicators, and lack comprehensive weighted scoring systems. It is argued that these shared shortcomings provide scope for potential improvements in future versions of these methodologies or new PAMEs. These results add new information to existing knowledge about the similarities and differences between methodologies and their individual strengths and weaknesses. It is argued that developing a better understanding of the unique characteristics of individual PAMEs may contribute to a better realisation of their full potential.

Acknowledgements

First, I would like to thank my supervisor Karen Hytten for her inputs, patience, understanding, dedication and time. Without her this could have never been possible. Thanks for being such a lovely person and an amazing guide through this process! I really appreciate all the hard work you put in this project.

Thanks to Massey University and its professors who thought me lessons for life. Thanks to my family and friends for their support during this process.

At last but not least, I would like to thank the Government of New Zealand and the lovely people in this country for giving me the opportunity of studying my Master degree in such beautiful and interesting place. I will always remember my time in New Zealand as an amazing adventure.



Table of Contents

Abstract	iii
Acknowledgements	v
Table of Contents	vii
List of Figures	xi
List of Tables	xiv
List of acronyms	xvi
Chapter 1: Introduction	1
1.1 Background	1
1.2 Problem statement.....	2
1.3 Aim of the research	2
1.4 Objectives.....	3
1.5 Contribution to knowledge.....	3
1.6 Thesis outline	4
Chapter 2: Concepts and background of the Protected Area Management Effectiveness Evaluations	6
2.1 Protected Area Management Effectiveness Evaluations	6
2.1.1 Typology of approaches to evaluate the effectiveness of protected areas	7
2.2 The emergence of protected area management effectiveness evaluations.....	9
2.3 Conceptualising management effectiveness evaluations.....	12
2.3.1 Basic concepts	12
2.3.2 Definition of protected area management effectiveness evaluations.....	13
2.3.3 IUCN’s framework for the creation of protected area management effectiveness evaluations	16
2.4 Reasons to evaluate the effective management of protected areas.....	25
2.4.1 Requirement of PAMEs in the Convention of Biological Diversity	25
2.4.2 Variety of protected areas and management objectives.....	29

2.4.3 Expansion of the global system of protected areas	33
2.4.4 Challenges facing protected areas	36

Chapter 3: Perspectives from the literature on protected area management

effectiveness evaluations..... 41

3.1 Global results of the protected area management effectiveness evaluations	41
3.1.1 First global study on protected area management effectiveness.....	41
3.1.2 Global trends on protected area management effectiveness evaluations	44
3.2 International methodologies for protected area management effectiveness evaluation (PAME)	49
3.2.1 Management Effectiveness Tracking Tool (METT)	50
3.2.2 Rapid Assessment and Prioritization of Protected Area Management (RAPPAM)	51
3.2.3 Enhancing our Heritage Toolkit (EoH)	51
3.2.4 Site Consolidation Scorecard (SCS)	52
3.3 Benefits of protected area management effectiveness evaluations	53
3.4 Challenges for protected area management effectiveness evaluations	57
3.4.1 Use of inappropriate methodologies, criteria or indicators	57
3.4.2 Balance between qualitative and quantitative indicators	58
3.4.3 Indicators with limited scoring systems	59
3.4.4 Lack of weighted scoring systems	59
3.4.5 Limitations on the implementation processes	60
3.4.6 Reliability of the data	60
3.4.7 Inconsistency in interpretation of the methodologies.....	62
3.4.8 Lack of use of the results.....	62
3.4.9 Difficulty in comparing results among methodologies.....	63

Chapter 4: Research design 65

4.1 Problem statement.....	65
4.1.1 Aim of the research	66
4.1.2 Objectives	67
4.2 Research method	67
4.3 Data collection.....	68

4.3.1	Selection of methodologies	68
4.3.2	Sources of data	69
4.4	Data analysis	70
4.4.1	Definition of category system	70
4.4.2	Development of analytical matrix.....	72
4.4.3	Comparisons, evaluation of ratings and general analysis	76
4.4.4	Limitations	79
Chapter 5: Results		81
5.1	Theme 1: Design and planning.....	81
5.2	Theme 2: Adequacy and appropriateness of management systems and processes.....	88
5.3	Theme 3: Delivery of protected area objectives.....	97
5.4	Summary of results	103
5.4.1	General comparisons of level of detail among methodologies.....	107
5.4.2	General comparison of sources of information among methodologies	108
5.4.3	Comparison of types of approaches used to assess the indicators.....	109
Chapter 6: Discussion		110
6.1	Similarities among methodologies.....	110
6.1.1	Criteria evaluated by all four methodologies.....	110
6.1.2	Weak of evaluation of the third theme: “delivery of protected area objectives”	112
6.1.3	Use of ordinal approaches for the evaluation of the indicators.....	113
6.1.4	Lack of aggregated scoring systems.....	114
6.2	Differences between the methodologies	115
6.2.1	Evaluation of different themes, elements and criteria.....	115
6.2.2	Methodologies showed different levels of detail in their indicators .	117
6.2.3	Variation of sources of information among methodologies	118
6.3	Strengths and weaknesses.....	120
6.3.1	Strengths and weaknesses of METT	120
6.3.2	Strengths and weaknesses of RAPPAM	122
6.3.3	Strengths and weaknesses of EoH	124

6.3.4 Strengths and weaknesses of SCS	126
6.4 General recommendations for selecting PAME methodologies	128
Chapter 7: Conclusion	130
References.....	135
Appendices.....	153

List of Figures

Figure 1: Themes and elements of IUCN’s framework for assessing management effectiveness of protected areas.....	18
Figure 2: Description of elements included in the IUCN framework	19
Figure 3: List of themes, elements and criteria that protected area management effectiveness evaluations should include	21
Figure 4: Example of levels of hierarchy assessed by PAME methodologies	22
Figure 5: Levels of assessments and their respective elements of focus	23
Figure 6: Brief description of IUCN’s protected area categories and their objectives	31
Figure 7: Growth of number and size of PAs in the world from 1962 to 2014.....	33
Figure 8: Levels of percentages (represented with shades of green) of protected areas per country	34
Figure 9: Percentage of land covered by terrestrial and marine protected areas from 1990 to 2014 in reference to the Aichi Target No.11	35
Figure 10: Global progress towards the implementation of PAME assessments in 2015.	45
Figure 11: Global percentages of PAME assessments per IUCN’s protected area category	46
Figure 12: Application of PAME assessments from 1990 to 2014 according to implementing organisation.....	47
Figure 13: Methodologies of PAME assessments recorded by regions.....	48
Figure 14: Working scheme for this research.....	70

Figure 15: The number of indicators used by METT, RAPPAM, EoH and SCS to assess the four criteria relating to the "Context" element	83
Figure 16: The level of detail of the indicators used by METT, RAPPAM, EoH and SCS to assess the four criteria in the "Context" element	84
Figure 17: The sources of information required for assessing the indicators used by METT, RAPPAM, EoH and SCS to evaluate the four criteria in the "Context" element ..	85
Figure 18: The number of indicators used by METT, RAPPAM, EoH and SCS to assess the five criteria relating to the "Planning" element	86
Figure 19: The level of detail of the indicators used by METT, RAPPAM, EoH and SCS to assess the five criteria in the "Planning" element	87
Figure 20: The sources of information required for assessing the indicators used by METT, RAPPAM, EoH and SCS to evaluate the five criteria in the "Planning" element .	88
Figure 21: The numbers of indicators used by METT, RAPPAM, EoH and SCSC to assess the four criteria included in the "Inputs" element.....	90
Figure 22: The level of detail of the indicators used by METT, RAPPAM, EoH and SCS to assess the four criteria in the "Inputs" element.....	91
Figure 23: The number of indicators used by METT, RAPPAM, EoH and SCS to assess the thirteen criteria relating to the "Processes" element	92
Figure 24: The level of detail of the indicators used by METT, RAPPAM, EoH and SCS to assess the thirteen criteria in the "Processes" element	94
Figure 25: The sources of information required for assessing the indicators used by METT, RAPPAM, EoH and SCS to evaluate the thirteen criteria in the "Processes" element.....	96

Figure 26: The number of indicators used by METT, RAPPAM, EoH and SCS to assess the two criteria relating to the "Outputs" element	98
Figure 27: The level of detail of the indicators used by METT, RAPPAM, EoH and SCS to assess the two criteria in the "Outputs" element	99
Figure 28: The sources of information required for assessing the indicators used by METT, RAPPAM, EoH and SCS to evaluate the two criteria in the "Outputs" element	100
Figure 29: The number of indicators used by METT, RAPPAM, EoH and SCS to assess the two criteria relating to the "Outcomes" element	101
Figure 30: The level of detail of the indicators used by METT, RAPPAM, EoH and SCS to assess the two criteria in the "Outcomes" element	102
Figure 31: The sources of information required for assessing the indicators used by METT, RAPPAM, EoH and SCS to evaluate the two criteria in the "Outcomes" element	103
Figure 32: Percentages of indicators used by METT, RAPPAM, EoH and SCS to assess the six elements of the PAMEs suggested by IUCN's framework	105
Figure 33: Comparison of percentages of levels of detail in the indicators used by METT, RAPPAM, EoH and SCS	107
Figure 34: Comparison of percentages of sources of information required to complete the methodologies compared.....	108
Figure 35: Comparison of percentages of approaches used by the indicators of METT, RAPPAM, EoH and SCS	109

List of Tables

Table 1: Approaches for the evaluation of the effectiveness of protected areas	8
Table 2: Example of part of the matrix for data analysis.....	73
Table 3: Descriptions of types of approaches used by the indicators in METT, RAPPAM, EoH and SCS.....	74
Table 4: Rating system for the types of sources of information required to complete the methodologies	75
Table 5: Rating system for the level of detail of the indicators.....	76
Table 6: Example of table for summarising results for “theme” categories	77
Table 7: Example of table for summarising comparisons of themes, elements, criteria, numbers of indicators, level of detail, areas of focus and sources of information	79
Table 8: Summary of the number of indicators used by METT, RAPPAM, EoH and SCS in relation to the elements and criteria within the "design and planning" theme	82
Table 9: Summary of the number of indicators used by METT, RAPPAM, EoH and SCS in relation to the elements and criteria within the "Adequacy and appropriateness of management systems and processes" theme	89
Table 10: Summary of the number of indicators used by METT, RAPPAM, EoH and SCS in relation to the elements and criteria within the "Delivery of protected area objectives" theme.....	97
Table 11: Summary of the numbers of indicators used in relation to themes, elements, criteria, level of detail and sources of information in METT, RAPPAM, EoH and SCS.	104

Table 12: Summary of the comparative analysis between METT, RAPPAM, EoH and SCS
..... 106

Table 13: Summary of principles for selecting or adapting PAME methodologies and
additional factors suggested by this research 129

Table 14: Summary of strengths and weaknesses of the four methodologies analysed. 133

List of acronyms

CAPAS	Central American Protected Areas System
CBD	Convention on Biological Diversity
EoH	Enhancing our Heritage Toolkit
GD-PAME	Global Database on Protected Area Management Effectiveness Evaluations
GEF	Global Environmental Fund
IBA	Assessment of Important Bird Areas
IUCN	International Union for Conservation of Nature
METTT	Management Effectiveness Tracking Tool
NGO	Non-Governmental Organization
OAS	Organisation of American States
PAs	Protected Areas
PAEL	Protected Areas Equity and Livelihoods
PAMEs	Protected Area Management Effectiveness Evaluations
PiP	Parks in Peril
PROARCA	Programa Ambiental Regional para Centroamérica / Regional Environmental Program for Central America
RAPPAM	Rapid Assessment and Prioritization of Protected Area Management
SCS	Site Consolidation Scorecard
TILCEPA	Theme on Indigenous and Local Communities, Equity and Protected Areas
TNC	The Nature Conservancy
UNEP	United Nations Environment Programme

UNESCO	United Nations Educational, Scientific and Cultural Organisation
USAID	United States Agency for International Development
WB	World Bank
WCMC	World Conservation Monitoring Centre
WCPA	World Commission on Protected Areas
WDPA	World Database of Protected Areas
WHS	World Heritage Sites
WWF	Worldwide Fund for Nature

Chapter 1: Introduction

1.1 Background

Protected areas (PAs) are fundamental for accomplishing conservation strategies. They provide the opportunity to achieve in situ conservation of significant natural and cultural elements (McNeeley & Miller, 1984; Mackinnon *et al.*, 1986; Leader-Williams, Harrison & Green, 1990; Chape *et al.*, 2005; Secretariat of the Biological Convention, 2008; Marino *et al.*, 2015). However, PAs require effective management in order to achieve their conservation goals and provide environmental, social, and economic benefits to society (Joppa & Pfaff, 2010).

Effective protected area management is a process that requires the analysis of the context and current situation of the PA. Management plans must be developed and inputs should be assigned to implement the strategies and management actions to achieve outputs and outcomes (Hockings *et al.*, 2006; Hockings *et al.*, 2015). Numerous methodologies have been developed around the world for assessing and monitoring the effectiveness of protected area management. These assessments are known as protected area management effectiveness evaluations (PAMEs) (Leverington *et al.*, 2008; Leverington, Lemos-Costa, Courrau *et al.*, 2010; Coad *et al.*, 2015). PAMEs are important because they contribute to identifying the extent to which the PAs are safeguarding their values and achieving their objectives. They also promote the improvement of protected area management through regular adaptations; contribute to the enhancement of decision-making; promote internal and external accountability; and encourage the inclusion of stakeholders in protected area management (Hockings *et al.*, 2006).

1.2 Problem statement

Currently, 193 countries have protected areas (Deguignet *et al.*, 2014). Of these countries, 192 are parties to the Convention of Biological Diversity (CBD). As such, they have committed to regularly evaluating the management effectiveness of their PAs (Convention on Biological Diversity, n.d.b; Secretariat of the Convention on Biological Diversity, 2004). However, the CBD does not define a universal PAME methodology to conduct these evaluations. Currently, more than 90 PAME methodologies exist (Coad *et al.*, 2015). These methodologies differ, evaluating different components of management and using different sources of information to assess them. Therefore they have different potential in terms of what they measure and how they measure it (Leverington, Lemos-Costa, Courrau *et al.*, 2010). The selection of which methodology to apply should be based on factors such as applicability, evaluation approach and the potential results (Hockings, 2003; Leverington, Lemos-Costa, Courrau *et al.*, 2010). However, there is currently a lack of detailed information on the fundamental characteristics and key differences between the major methodologies, which makes making an informed selection challenging.

1.3 Aim of the research

The aim of this research is to conduct a comparative analysis of the fundamental characteristics, similarities and differences of four of the most commonly used PAME methodologies. The analysis was conducted in relation to the framework developed by IUCN for the creation of PAME methodologies. In particular, the characteristics of the indicators used in the methodologies were identified and their viability was assessed. The PAME methodologies chosen for this comparative analysis were: the Management Effectiveness Tracking Tool

(METT) (Stolton *et al.*, 2007); the Rapid Assessment and Prioritization of Protected Area Management (RAPPAM) (Ervin, 2003); the Enhancing our Heritage Toolkit (EoH) (Hockings *et al.*, 2008) and the Site Consolidation Scorecard (SCS) (The Nature Conservancy, 2003). This analysis will identify key considerations to inform future selections of PAME methodologies, and make recommendations about when these methodologies might be most useful.

1.4 Objectives

In order to achieve the research aim, this thesis had three objectives, to:

- Identify and compare the themes, elements, criteria and indicators evaluated by the four methodologies to detect similarities and differences;
- Identify and compare the approaches used by each methodology to assess their indicators;
- Investigate the strengths and weaknesses of each methodology and provide recommendations to inform future selections.

1.5 Contribution to knowledge

This thesis seeks to contribute to the limited existing literature on the characteristics of the four chosen PAME methodologies. No detailed comparisons of PAME methodologies have been published and existing descriptions provide limited information about the fundamental characteristics of each methodology (Stoll-Kleemann, 2010; Leverington, Hockings *et al.*, 2007). The results will inform potential users on the strengths and weaknesses of these four PAMEs and what they can deliver. Additionally, the content analysis method utilised can be used as a basis for future comparisons. As argued by

Stoll-Kleemann (2010) more research on PAMEs is needed to highlight their potential and inform future improvements.

1.6 Thesis outline

This thesis consists of seven chapters, including this introduction, which is Chapter 1. Chapter 2 will present the background theory of PAMEs, explaining the different approaches used to evaluate the effectiveness of PAs to provide a context for the emergence of PAMEs. A summary of their history will be outlined and the basic concepts related to management effectiveness evaluations will be described. The IUCN's framework for the creation of PAMEs will also be introduced to explain its relevance for the analysis. In the second part of this chapter, four of the most significant reasons to conduct PAMEs will be discussed.

Chapter 3 will critically review the literature exploring the applicability of the PAMEs. It will discuss their expected benefits and results as well as the potential challenges before, during and after their implementation. This chapter will also review the most relevant results obtained from recent applications of PAMEs worldwide. The chapter will conclude with a general description of the four methodologies compared in this thesis.

Chapter 4 will explain the research design used for the comparative analysis of the four PAME methodologies. It will restate the problem addressed by this research, as well as the aim and objectives of the analysis. It will then explain the data collection and analysis methods used.

Chapter 5 will present the results obtained from the comparative analysis. The results will be explained and summarised using descriptive statistics and tables. Chapter 6 will then discuss these findings. The results will be interpreted and compared with the results of similar studies, and the implications and contributions of the study will be discussed.

Finally, Chapter 7 will provide the conclusions of the research. It will indicate the importance of the topic and the research conducted. This chapter will review the methods and findings of the study as well as their implications. Additionally, it will provide a summary of the most relevant strengths and weaknesses identified in the four methodologies by this research. The chapter will finalise with recommendations for future comparisons of PAME methodologies.

Chapter 2: Concepts and background of the Protected Area Management Effectiveness Evaluations

The conservation of the world's biodiversity is strongly linked to the effective management of protected areas (PAs) (Jo Mulongoy & Chape, 2004; Barber, Miller & Boness, 2004; Worboys & Trzyna, 2015; Hockings, Leverington & Cook, 2015). Effective management in PAs is crucial to successfully achieve biodiversity conservation, sustainable environmental management and the protection cultural assets. Ensuring effective management is a challenge all PAs face (McNeeley & Miller, 1984; Mackinnon *et al.*, 1986, Leader-Williams *et al.*, 1990; Chape *et al.*, 2005; Dudley, 2008; Marino *et al.*, 2015). Protected Area Management Effectiveness evaluations (PAMEs) provide a valuable means to address this challenge.

This chapter will provide background information to explain the relevance of PAMEs. The first section of the Chapter will outline a series of key concepts and definitions required to understand what the PAMEs are and what they evaluate. The second section of the Chapter will explain the reasons behind the growing use of this type of evaluations around the world.

2.1 Protected Area Management Effectiveness Evaluations

The effectiveness of protected area management can be evaluated using different approaches. This section will explain how PAMEs differ from other approaches used for the assessment of the effectiveness of PAs. It will then provide an overview of the history of the emergence of PAMEs. Next, it will explain the basic concepts underpinning the theory of PAMEs and finally, it will

explain the framework for the development of PAME methodologies created by the International Union for Conservation of Nature (IUCN).

2.1.1 Typology of approaches to evaluate the effectiveness of protected areas

Distinct approaches for the evaluation of the effectiveness of PAs have been developed. These approaches differ because they evaluate different aspects related to the effectiveness of PAs. Table 1 explains the four main approaches identified in the literature (Leverington, Lemos-Costa, Courrau *et al.*, 2010; Hockings *et al* 2015). The table provides a description of the approaches, including their objectives and characteristics, the key questions answered by their results and the types of sources of information they require to be completed. Despite their differences, these approaches may be considered as complementary, since all of them measure different aspects the effectiveness of PAs (Leverington, Lemos-Costa, Pavese, *et al.*, 2010).

Table 1: Approaches for the evaluation of the effectiveness of protected areas

Sources: Hockings *et al.*, 2015 & Leverington, Lemos-Costa, Courrau, *et al.*, 2010.

Approach	Description	Key questions	Types of sources of information
1st Approach: PA extent and location	This approach evaluates the coverage of biodiversity represented in the PA by the assessment of the extent and location of the PA in relation to the range of biodiversity values. Different approaches are being used as guides to identify relevant sites for conservation and for the creation of new PAs, such as Important Bird Areas (IBAs), the Alliance for Zero Extinction sites (AZE) and systematic conservation planning studies, which focus on the representation of ecoregions and habitats rather than species and species collections.	<p>How many PAs exist in a country or region?</p> <p>What is the individual and total extent of a PA system?</p> <p>Are PAs effectively covering key ecoregions and habitats?</p> <p>Are PAs effectively representing diversity of ecoregions and habitats, as well as landscape elements, wetland types and species?</p>	<ul style="list-style-type: none"> • Biological research • Remote sensing technology • Detailed monitoring
2nd Approach: Large-scale assessments	This approach assesses the extent to which PAs reduce large-scale environmental impacts, such as forest clearing or habitat degradation. They compare the coverage of PAs with areas without protection, demonstrating the effectiveness in the reduction of rates of habitat change. Remote sensing and other special tools are used to calculate the economic and environmental impacts of PAs at national scale. They provide objective information about conservation success at a broad level. However, they use limited indicators, which are not sensible to other relevant changes such as loss of populations.	<p>Have PAs reduced deforestation and other habitat loss?</p> <p>How do PAs affect local communities?</p> <p>Have PAs increased or alleviated poverty?</p>	<ul style="list-style-type: none"> • Remote sensing technology • Counterfactual analyses • Socio-economic assessments • Biological research
3rd Approach: PA management effectiveness evaluations (PAMEs)	This approach assesses the performance of individual PAs, groups or systems of PAs. The majority of these assessments evaluate the elements defined by the IUCN's framework, which are context, planning, inputs, processes, outputs and outcomes of their management system and processes, and the delivery of objectives. These types of assessments have been developed by protected area governmental agencies and international conservation organisations since the 90s to improve management, prioritize resourcing and to improve accountability. Thousands of these assessments have been executed throughout the world; nevertheless there is no specific methodology to use, different countries and regions are using different methodologies.	<p>How well designed are the PAs and the PA systems?</p> <p>Does the management of PAs include appropriate planning, allocation of resources and processes?</p> <p>Are PAs achieving their conservation objectives?</p>	<ul style="list-style-type: none"> • Experts and managers knowledge • Monitoring • Biological/Social research
4th Approach: PA outcomes / detailed monitoring	This approach is considered to be a subset of the PAMEs, but focused specifically in outcomes. It requires detailed monitoring and reporting on specific conditions and values of the PA, such as animal population, forest condition, cultural values and socio-economic impacts. Methodologies for these types of systematic studies have been developed by The Nature Conservancy (TNC), and management agencies in Australia, South Africa and Canada. Ideally this detailed information provides results about the real outcomes achieved in the PA.	<p>Are PAs conserving species and habitats?</p> <p>Are values such as endangered species being conserved and/or restored?</p> <p>What is the impact of the PAs on the local communities?</p>	<ul style="list-style-type: none"> • Biological research conducted by specialists • Detailed monitoring

The scope of this thesis is limited to the third category, PA management effectiveness evaluations (PAMEs). This approach is currently the most commonly applied around the world (Secretariat of the Convention on Biological Diversity, 2004).

2.2 The emergence of protected area management effectiveness evaluations

One of the first recorded efforts to conduct PAMEs was in 1972. The Conservation Foundation Task Force of the United States (US) National Parks System, exposed a concern on the lack of evaluation of their national parks. Thereupon, the US Parks Service adopted the annual “Park Environmental Report” system (Hockings *et al.*, 2007).

In 1982, during the 3rd World Congress on National Parks in Bali, Indonesia, the topic re-emerged and the development of tools and guidelines to evaluate the ecological and managerial quality of PAs was defined as one of the actions in the Bali Action Plan created after the Congress (Hockings *et al.*, 2007; Leverington, Lemos-Costa, Courrau *et al.*, 2010). In 1986, the outcomes of the Bali Congress were compiled into the book “Managing PAs in the Tropics”, which included a chapter on evaluation of the effectiveness of management of PAs. The chapter explained the objectives of such evaluations, who could implement them and how. It also suggested some methods to implement the evaluations and included an example of a questionnaire and a checklist for the assessments (MacKinnon, MacKinnon, Child, Thorsell, 1986). From this point onwards, PAMEs started to appear in international literature and were discussed more widely (Leverington, Lemos-Costa, Courrau *et al.*, 2010).

In 1992, during the 4th World Congress on National Parks in Caracas, Venezuela, the lack of effective management was identified as one of four major issues PAs were facing (Leverington, Lemos-Costa, Courrau *et al.*, 2010). Congress participants developed a draft for an international system for monitoring PAs management effectiveness. However, this methodology was never adopted (Hockings *et al.*, 2007).

Throughout the 1990s, publications on PAME methodologies started to become available. Among the first, was Rivero-Blanco's (1992) methodology, which proposed a method that applied a scoring system to evaluate PA management. More methodologies started to emerge, mainly in Central America by de Faria (1993); Courrau (1997); and Izurieta (1997) and in Australia by Hockings (1998) (Leverington, Hockings, Lemos-Costa, 2008; Hockings *et al.*, 2015).

In 1990, The Nature Conservancy's (TNC) project Parks in Peril (PiP) was initiated in Latin America and the Caribbean. After seven years of working in 15 countries, they had enough experience to develop a series of criteria to evaluate PA functionality. The project tested and revised these criteria and by 1999, they were formalised as a tool in a publication by TNC's & the United States Agency for International Development (USAID) named "Measuring success: the parks in peril site consolidation scorecard manual" (Martin & Rieger, 2003). This was the first PAME methodology published by an international conservation organisation.

In 1996, the IUCN and its international programme "the World Commission of PAs" (WCPA) created a task force to develop the first official guide to create PAME methodologies. The work started in 1996 and finished in

2000, with the publication of the first international framework for the creation of PAME methodologies (Hockings *et al.*, 2000; Hockings *et al.*, 2007; Leverington, Hockings, Lemos-Costa, 2008). In 2006, a revised second edition was released. Since its creation, a variety of methodologies have been developed and implemented in numerous countries based on its recommendations (Hockings *et al.*, 2006; Hockings, Stolton, & Dudley, 2007; Leverington, Lemos-Costa, Courrau *et al.*, 2010).

In 2000, the World Wide Fund for Nature (WWF) released its first PAME methodology: the Rapid Assessment and Prioritization of Protected Area Management (RAPPAM). In 2003, WWF released a second methodology: the Management Effectiveness Tracking Tool (METT). In 2003, TNC updated its Site Consolidation Scorecard (SCSC) ensuring it followed the IUCN's framework. In 2008, the United Nations Educational Scientific and Cultural Organisation (UNESCO) published a PAME methodology called Enhancing Our Heritage Toolkit (Ervin, 2003; Martin & Rieger, 2003; Stolton *et al.*, 2007; Hockings *et al.*, 2008). Along these methodologies with international applicability, others have been created with national, regional and international applicability.

2.3 Conceptualising management effectiveness evaluations

2.3.1 Basic concepts

The concepts of management and effective management are fundamental to PAMEs. The management of PAs can be defined as:

The combination of actions with legal, political, administrative, research, planning, protective, co-ordinating, interpretative or educational character that result in the better use and permanence of a PA, and the accomplishment of its objectives (Cifuentes, Izurieta, & de Faira, 2000).

Others argue that the management of PAs is an activity based on processes relating to four main functions: planning, organising, leading (implementing) and controlling (evaluating). This concept of management also considers that the accessibility and use of resources are fundamental for management (Worboys & Trzyna, 2015). Both of these definitions of management recognise that management requires actions, inputs and the accomplishment of goals. But what makes the management of PAs effective?

Cifuentes *et al.* (2000) suggest effective management can be considered as the combination of actions that make it possible to satisfactorily fulfil the functions for which a PA was created, based on the areas' particular traits, capacities and context. Worboys & Trzyna (2015) argue that effective management should be goal-directed. It should have a purpose and a direction within a strategic plan to accomplish specific results (Worboys & Trzyna, 2015). Hockings *et al.* (2006 & 2015) explain the concept of effective management further. They describe it as a process that begins with the analysis of the PA's context, values, pressures, threats, opportunities, stakeholders and political atmosphere. Then, the management should progress into a planning stage where the vision, goals, objectives and strategies are established. To achieve these

plans the allocation of inputs is required. Effective management also includes the implementation of the planned management actions, which should end up in producing outputs (goods or services) established in the management plans. And finally, the management should generate impacts or outcomes, which allow the achievement of the previously defined goals and objectives of the PA (Hockings *et al.*, 2006; Hockings *et al.*, 2015). The concept provided by Hockings *et al.* (2006 & 2015) encompasses what other authors consider and more, it covers all the aspects of management that should be evaluated in the PAMEs.

2.3.2 Definition of protected area management effectiveness evaluations

A PAME is “an assessment of how well a PA is being managed, it identifies the extent to which the site is protecting its values and achieving its goals and objectives” (Hockings *et al.*, 2006). These evaluations are “generally achieved by the assessment of a series of criteria (represented by carefully selected indicators) against agreed objectives or standards” (Hockings *et al.*, 2006).

The PAMEs have four main purposes, to:

- Promote better management with regular adaptations to the changing situations of each PA (adaptive management cycle);
- Contribute to the improvement of the decision-making processes regarding resource allocations;
- Support internal and external accountability and transparency; and
- Encourage the inclusion of communities and other relevant stakeholders to promote the PA values (Hockings *et al.*, 2006).

Experts on PAMEs suggest that evaluations should contribute to answering key questions, such as:

- Is management of the PAs effective and how can it be improved?
- Are specific projects, interventions and management activities achieving their objectives, and how can they be improved?
- How can the PAs report on what they are doing?
- Do the PAs have enough resources to conduct effective management and how can they be improved?
- Are the PAs working with the appropriate management inputs, processes, governance and financial mechanisms? and
- Are the PAs maintaining their values and achieving their objectives, delivering positive outcomes for biodiversity conservation, ecosystem service provision and human livelihoods? (Juffe-Bignoli *et al.*, 2014; Stolton, 2008; Leverington & Hockings, 2004).

PAMEs provide the opportunity to identify milestones met in the process towards achieving the general objectives of PAs. PAMEs also promote regular reviews of performance, which provide information for the necessary corrective actions in management (Worboys & Trzyna, 2015). PAMEs should work as incentives to improve understanding; communication and learning (Growcock *et al.*, 2009) Moore and Hockings (2013) argue that PAMEs may also enhance the chances for identifying risks and missed opportunities in PAs.

According to Courrau (1999) and Leverington, Lemos-Costa, Courrau *et al.*, (2010) PAME methodologies must be practical, effective and realistic. They should also be:

- Simple: easy to use and not require specialised technology or qualifications;
- Low cost: cost effective, considering the limited resources available for the management of PAs;
- Quick: the generation of results should not require too much time;
- Applicable: useful in a variety of contexts;
- Promoting excellence: contributing to constant improvement and adaptive management;
- Capable to evolve: able to adapt when necessary; and
- Transparent: providing trustworthy data (Courrau, 1999; Leverington *et al.*, 2007; Leverington, Lemos-Costa, Courrau *et al.*, 2010).

PAME methodologies should also follow a series of principles to make them effective, they should be:

- Useful and relevant to the PA, promoting the improvement of the management, relationships and awareness;
- Logical, systematic, well-founded, transparent and comprehensive using an accepted framework with a balanced approach;
- Based on holistic, balanced and useful indicators;
- Accurate in terms of truthfulness, objectivity, consistency and up-to-date information;
- Practical to implement with available resources, ensuring that measuring and reporting is achievable;

- Cooperative with the use of good communication, teamwork and participation of all stakeholders throughout all stages;
- Part of an effective management cycle, linked to defined values, objectives and policies, and part of strategic, business, financial plans; and
- Focused on positive and timely communication and application of the results (Leverington, Pavese, Lemos-Costa, 2007).

In order to promote the application of these principles in all PAMEs, the IUCN established a framework for developing PAME methodologies.

2.3.3 IUCN's framework for the creation of protected area management effectiveness evaluations

In 2000, the IUCN and its World Commission on Protected Areas (WCPA) published the first framework for the creation of PAME methodologies. This framework was published under the title of: "Evaluating effectiveness: a framework for assessing the management of protected areas". A second and revised edition of this framework was released in 2006 (Hockings *et al.*, 2007; Stolton, 2008; Leverington, Lemos-Costa, Courrau *et al.*, 2010). The framework has been widely utilised by numerous institutions around the world to create new PAME methodologies (More & Walker, 2008).

The IUCN-WCPA framework is particularly valuable because it defines the basic components PAME methodologies should have. This framework is a flexible design tool, which guides the creation of new PAME methodologies (Stolton, 2008; Hockings, Stolton & Dudley, 2002). The framework encourages the

collection of essential data required in any PAME and it guides the PA specialists on structure and processes for creating contextualized methodologies.

The framework is based on the premise that effective management starts with a vision, progresses into planning and allocation of resources, which then result into management actions, which produce outputs and outcomes. The monitoring and evaluation of these aspects of the management cycle enable the improvement of the management through a learning process (Hockings *et al.*, 2002).

The framework can be utilized to develop different types of assessments. For instance, it can be used to develop a long-term monitoring programs or rapid assessments (Hockings *et al.*, 2007). Different situations require different levels of assessments, approaches and emphasis. Resources such as time and money are limiting factors that influence the evaluation methods. The scope of the assessments may also be different. They may include a geographical scope (e.g. individual site or PA system) or a topical scope (e.g. biodiversity conservation, threats or pressures identification) (Phillips, 2000; Hockings *et al.*, 2015).

According to this framework, PAMEs should evaluate the extent to which the management of the PA is actually contributing to the protection of its values and achieving its goals and objectives. To achieve this, all PAMEs should evaluate three broad themes, which encompass six elements. These themes and elements are illustrated in Figure 1.



Figure 1: Themes and elements of IUCN's framework for assessing management effectiveness of protected areas

Source: Hockings *et al.*, 2006.

The elements encompass different questions, which need to be addressed and evaluate different conditions of PAs and their management. The key characteristics of each element are presented in Figure 2.

Elements of evaluation

Context

Planning

Inputs

Process

Outputs

Outcomes

Questions to answer

Where are we now?
What is the current situation?

Where do we want to be?
Are plans in place and adequate?

What do we need?
Are resources adequate?

How do we go about it?
How is management carried out and does it meet relevant standards?

What were the results of management programmes and actions?

What did we achieve?

Focus of evaluation

Status of: values, threats, policy and cultural and social environment

Appropriateness of: design, legislation, vision, objectives and planning

Adequacy of: resources such as budget, staff, equipment and information

Efficiency of: management actions and their performance

Effectiveness of: management programmes and actions, delivery of products and services

Effectiveness & appropriateness of: outcomes, conditions of values & the extent of achievement of objectives

Figure 2: Description of elements included in the IUCN framework

Source: Nolte *et al.*, 2010; Hockings *et al.*, 2009; Stolton, 2008; Hockings, 2003; Hockings *et al.*, 2002.

Within the elements, certain criteria should be evaluated. These criteria are listed in Figure 3, under the names of the themes they belong to. The IUCN's framework introduced a list of criteria, which was subsequently updated by Leverington, Lemos-Costa, Courrau, *et al.* (2010) and Hockings *et al.*, (2015). According to this updated list, PAMES should evaluate 36 criteria. These criteria will be used as references for conducting the analysis of this study.

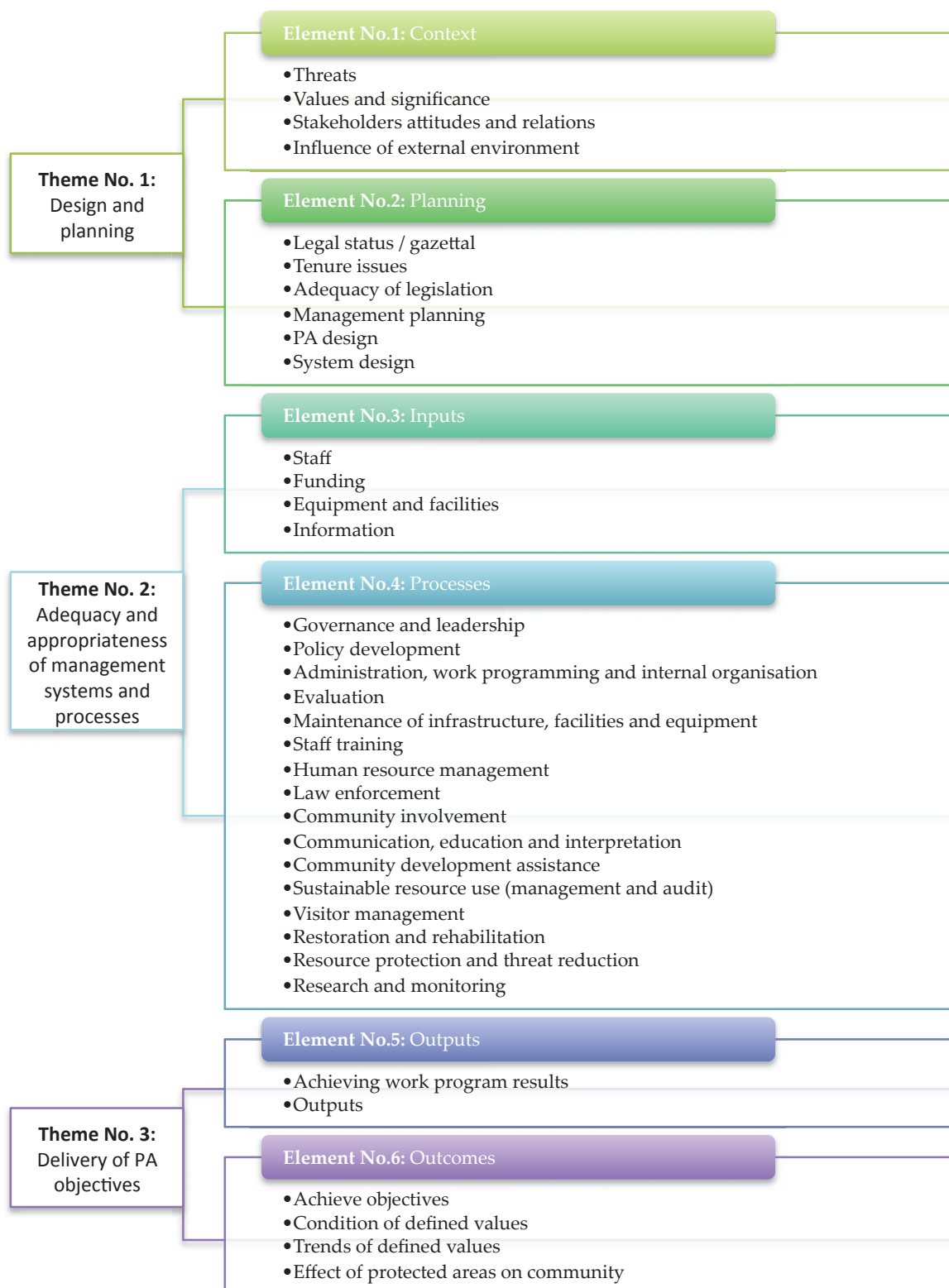


Figure 3: List of themes, elements and criteria that protected area management effectiveness evaluations should include

Source: Hockings *et al.*, 2015; Leverington, Lemos-Costa, Courrau, *et al.*, 2010; Hockings *et al.*, 2006

Figure 4 shows the hierarchy of components that should be assessed by the PAMEs. The first level encompasses the three themes and the second level the six elements. The performance of a PA in relation to each element is assessed by using the set of criteria showed in Figure 3. Each criterion is a category of conditions or processes that describe the elements being measured. These criteria are assessed by using a range of the indicators. An indicator is a quantitative or qualitative variable, which provides specific information about the characteristics of a criterion. The analysis of all themes, elements and criteria provides a perspective of the current status and trends in the management of the PAs (Hockings *et al.*, 2006).

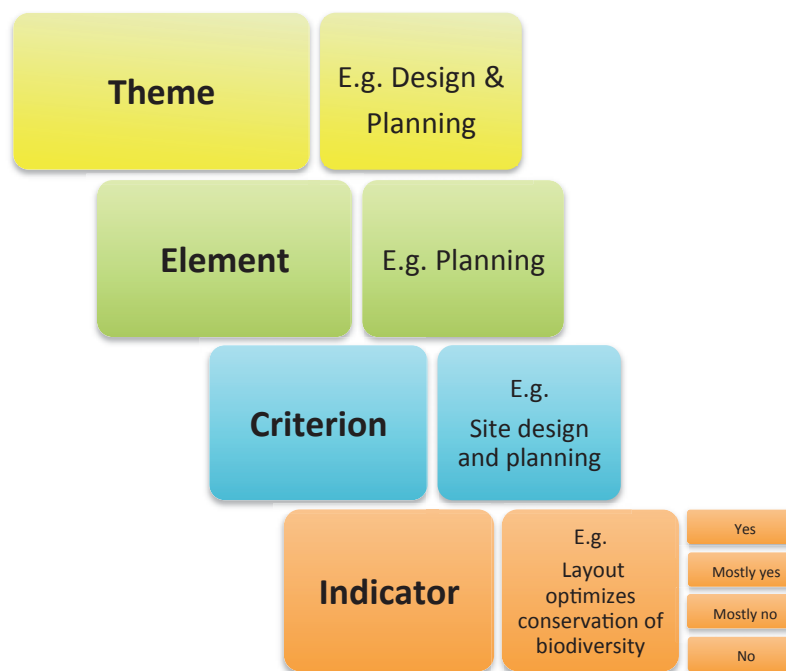


Figure 4: Example of levels of hierarchy assessed by PAME methodologies

Source: Hockings *et al.*, 2006 & Ervin, 2003.

The themes and elements assessed by different PAMEs vary significantly (Hockings, 2003). Hockings (2003) reviewed 27 methodologies and identified that only 26% included more than half of the elements, while the majority (78%) assessed merely outcomes. Hockings argued that the methodologies that analyse the six elements generate more useful information (Hockings, 2003).

Depending on the elements measured, PAMEs can be categorised into three different levels. These levels reflect the scope, their purposes and the different sources of information required (Hockings *et al.*, 2000; Hockings *et al.*, 2002), as shown in Figure 5.

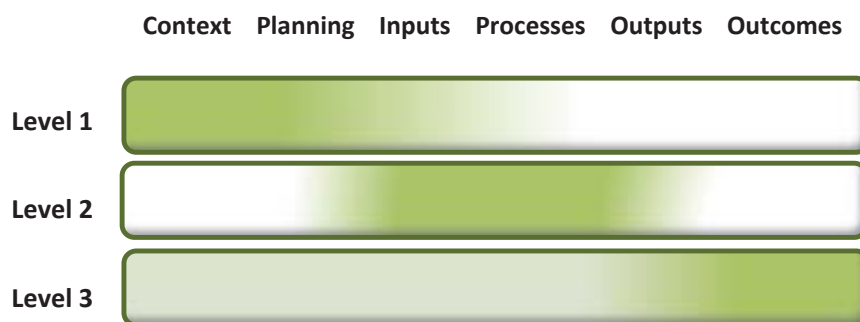


Figure 5: Levels of assessments and their respective elements of focus

Source: Hockings *et al.*, 2000 & Hockings *et al.*, 2002.

Level 1: these assessments primarily work with readily available data. They focus on context and planning. Little or no additional data collection is conducted to assess the context, appropriateness of planning, inputs, and processes. The assessments may be done in individual PAs or networks. Usually, they conduct the evaluations based on generic criteria, which are not adapted to local contexts. They include limited assessments of outputs and outcomes. They rely on literature reviews and informed opinions of managers and assessors.

Level 2: these assessments combine readily available data with some additional data provided by monitoring of outputs and outcomes. In this level, some criteria might be adapted to local contexts.

Level 3: these assessments primarily monitor the achievements of management objectives and mainly focus on outputs and outcomes, while also assessing context, planning, inputs, and processes. These evaluations are directed at site level (Hockings *et al.*, 2000; Hockings *et al.*, 2002).

Ideally, PAME methodologies should incorporate all the elements, which are interrelated and together generate a holistic perspective. However, in some circumstances assessments might be driven by different needs and they may only assess specific components (Hockings, 2003; Hockings *et al.*, 2002). Regardless the approach taken, PAMEs provide a valuable approach to monitor the milestones achieved in the complex endeavour of conservation.

2.4 Reasons to evaluate the effective management of protected areas

This section will elucidate why PAMEs have gained an international popularity in recent years. Four of the most important reasons why PAs should conduct PAMEs are explained in the following subtitles, to justify their importance.

2.4.1 Requirement of PAMEs in the Convention of Biological Diversity

The Convention on Biological Diversity (CBD) was developed at the Earth Summit in Rio de Janeiro in 1992. Its main objectives are to conserve global biological diversity, to promote sustainable resource use and to ensure a fair and equitable sharing of benefits arising from the use of genetic resources (United Nations, 1992). 196 Parties, including the European Union and other self-governed territories have signed and ratified this convention. The only countries that have not signed it are the United States of America and the Holy See (The Vatican) (CBD, n.d.).

Several subjects are addressed in the 42 articles of the CBD. Among them, article No. 8 states the importance of the institutionalisation and management of PAs. This article states that contracting parties shall establish PA systems with guidelines and legislation to conserve biological diversity (United Nations, 1992). This is because PAs are considered as strategic elements for the implementation of global conservation targets (Secretariat of the Convention on Biological Diversity, 2004).

A “strategic plan for biodiversity 2011-2020” was created to guide the implementation of the CBD. This plan established the Aichi Biodiversity Targets

(listed in Appendix 1), which include 5 strategic goals and 20 targets, (CBD, n.d.b). One of these strategic goals recognises the importance of the role PAs have on the protection and sustainable management of biodiversity:

“Strategic goal C: to improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity” (CBD, n.d.b).

Within this strategic goal, three targets were defined, among them Target 11 is of particular relevance to the PAs around the world:

Target 11: By 2020, at least 17% of terrestrial and inland water, 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 landscapes and seascapes (CBD, n.d.b).

The Secretariat of the CBD proposed a specific programme to ensure the achievement of this target. This programme was called the Programme of Work on Protected Areas (PoWPA) (Secretariat of the Convention on Biological Diversity, 2004). At the seventh meeting of the Conference of Parties of the CBD (COP7) in 2004, all the participants agreed upon the creation of the PoWPA. This programme aimed to support the work done by the IUCN and its members, in regards to the management of PAs (Worboys & Trzyna, 2015; Secretariat of the Convention on Biological Diversity, 2004).

The Parties of the PoWPA committed to accept the challenge of planning, selecting, establishing, strengthening and managing PAs through participatory,

ecologically representative and effectively managed systems of PAs. Currently, the PoWPA is the most significant commitment made by the international community regarding PAs (Worboys & Trzyna, 2015; Secretariat of the Convention on Biological Diversity, 2004).

The PoWPA established three initial steps to promote the evaluation and monitoring of the management effectiveness of PAs:

1. The identification of an agreed set of standards for PAs;
2. The development and application of systems for the evaluation of the management of PAs;
3. The establishment of systems for monitoring the status and trends of PAs and their resources (Dudley *et al.*, 2005; Secretariat of the Convention on Biological Diversity, 2004).

The PoWPA is constituted by 4 elements, 16 goals and 92 activities. The four elements of the programme are:

1. Direct actions for planning, selecting, establishing, strengthening, and managing protected area systems and sites;
 2. Governance, participation, equity and benefits-sharing;
 3. Enabling activities; and
 4. Standards, assessments and monitoring
- (Secretariat of the Convention on Biological Diversity, 2004).

Element No. 4 is of particular relevance to PAMEs, because it justifies and promotes the evaluation of the management of the PAs. Within this element, 4 goals were designated:

- 4.1. To develop and adopt minimum standards and best practices for national and regional protected areas;
- 4.2. To evaluate and improve the effectiveness of protected areas management;
- 4.3. To assess and monitor protected area status and trends; and
- 4.4. To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected area systems.

(Secretariat of the Convention on Biological Diversity, 2004).

Goal 4.2 particularly refers to the application of PAMEs. The target of this goal is: “By 2010, frameworks for monitoring, evaluating and reporting on protected areas management effectiveness at sites, national and regional systems, and trans-boundary protected areas are adopted and implemented by all Parties” (Secretariat of the Convention on Biological Diversity, 2004). According to this goal, by 2015 all the parties should have identified a PAME methodology to conduct their evaluations. However, this is not the case. Some countries have not yet implemented any PAME methodology (Coad *et al.*, 2015).

One of the suggested activities for the Parties in section 4.2.2, is that they should “implement management effectiveness evaluations for at least 30% of each Party’s PAs by 2010...” (Secretariat of the Convention on Biological Diversity, 2004). This activity was updated in 2010 with the COP10 decision X/31, which stated that the Parties should evaluate the management effectiveness of at least 60% of their PAs by 2015 (Convention on Biological Diversity, 2010). However, only a minority of Parties have accomplished this activity (Coad *et al.*, 2015).

The CBD and its PoWPA are two crucial efforts with international relevance that encourage their signatory Parties to identify and implement PAMEs (Secretariat of the Convention on Biological Diversity, 2004). Even though the proposed targets have not been achieved, more attention has been given to PAMEs around the world.

2.4.2 Variety of protected areas and management objectives

PAs are indispensable in achieving global conservation goals. They support in situ conservation and contribute to the maintenance of important natural and cultural assets (McNeeley & Miller, 1984; Mackinnon *et al.*, 1986, Leader-Williams *et al.*, 1990; Chape *et al.*, 2005; Dudley, 2008; Leverington, Lemos-Costa, Pavese *et al.*, 2010; Stoll-Kleemann, 2010; Dudley, 2010; Marino *et al.*, 2015).

Since the late eighteen hundreds, PAs have been created all over the world. Governments, NGOs and international institutions have supported this endeavour (Leverington, Lemos-Costa, Courrau *et al.*, 2010). Among these institutions, the most influential has been the IUCN. The IUCN has supported the institutionalisation of PAs around the world and it has worked to improve PA management since it was founded in 1948 (IUCN, 2010).

In 1980, IUCN presented the World Conservation Strategy. This document officially defined a PA as:

A clearly defined geographical space recognised, dedicated and managed, through legal or other effective means, to achieve the

long-term conservation of nature with associated ecosystem services and cultural values (IUCN, 1980).

This definition is still widely used today, and as such, is the definition of PA used in this thesis.

In 1992, the CBD, defined a PA as “a geographically defined area, which is designated or regulated and managed to achieve specific conservation objectives” (United Nations, 1992). This and the IUCN’s concept of PA encompass a wide range of possible types of PAs. Thus, to clarify the types of PAs, IUCN initiated a process to develop a global system for categorising PA (Dudley, 2008).

In 1994, the IUCN published a system for classifying PAs, which mainly differentiated the PAs based on their management objectives. The IUCN’s system has been used around the world since it was established. Nonetheless, different authors have debated the possibilities of modifying the categories to improve their applicability (Locke & Dearden, 2005; Boitani *et al.*, 2008; Dudley, Parrish, Redford & Stolton, 2010). Hence, the categories have been updated to adapt to the new challenges arising in the classification of new PAs. The current categories are briefly described in Figure 6, with the primary management objective (indicated with a capital “O”) in each category highlighted in colour (Dudley, 2008).



Figure 6: Brief description of IUCN's protected area categories and their objectives

Source: Dudley, 2008.

According to Dudley, Hockings *et al.* (2004), PAs are expected to conserve biodiversity by performing 4 crucial roles, to:

- Function as sanctuaries for threatened species where they can refuge when their natural ecosystems are being destroyed.
- Support healthy populations of species and renew and maintain genetic diversity and balance in ecosystems.
- Provide the opportunity to maintain species and ecosystems that could not be preserved in natural conditions.
- Act as living laboratories where scientists and researchers can learn about ecosystem's management.

Other than their objectives related with the protection of biodiversity, PAs have various other benefits. They are key components in climate change mitigation. They provide ecosystem services related to well-being and health for humans and other species. They provide places for sustainable tourism and recreation, which also help to promote social awareness on ecological issues. PAs also contribute to protecting places of cultural and spiritual value. Furthermore, when integrated into plans for land-use PA can offer economic opportunities for rural economies (Naughton-Treves, Buck Holland, Brandon, 2005; Dudley, 2008; Secretariat of the Biological Convention, 2008; Stolton & Dudley, 2010; Kinzig *et al.*, 2011; Lopoukhine *et al.*, 2012; Geldmann *et al.*, 2013; Costanza *et al.*, 2014).

IUCN's PA categories demonstrate the variety among PAs and their management objectives. But regardless of their category and objectives, all PAs must implement management actions to achieve their conservation goals, thus PAMEs can be useful tools to monitor their achievements. According to the CBD and the PoWPA, the evaluation of the management implemented to achieve the

goals of the PAs should be a priority (Secretariat of the Biological Convention, 2004). Nonetheless, the selection of which methodology to use when evaluating the management of the different categories of PAs is not clarified by the CBD, or other international agreements. Perhaps, depending of the types of PAs and their objectives, different PAMEs could be more useful.

2.4.3 Expansion of the global system of protected areas

A tendency for the expansion of PAs throughout the world has been identified, particularly in developing countries where biodiversity is greatest (Naughton-Treves, Buck Holland, Brandon, 2005). International organizations have also directed their efforts to support the creation of PAs and to improve their management (Lopoukhine & Sandwith, 2012; IUCN, 2015). PAs around the world are growing in numbers and size. Figure 7 illustrates the cumulative growth in the number and area of protected areas from 1872 to 2001. As shown in Figure 7, since the 1960s the number of PAs has grown significantly.

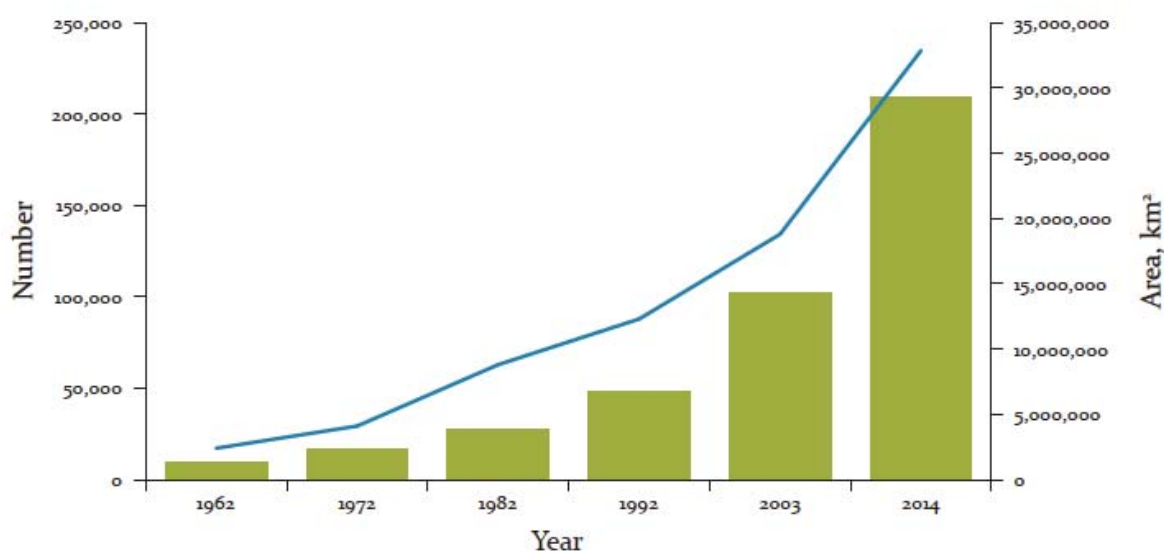


Figure 7: Growth of number and size of PAs in the world from 1962 to 2014

Source: Deguignet, *et al.*, 2014.

To keep track of the global growth of PAs, a joint effort by the United Nations Environment Programme (UNEP) and the IUCN developed the World Database of Protected Areas (WDPA) in 2010. According this database, some countries have greater percentage of their total land as PAs than others. Figure 8 shows four ranges of percentages (<5%, 5-10%, 10-17%, >17%), which are identified with different shades of green. The countries with higher percentages (over 17%) of terrestrial and marine PA are identified with the darkest green (Juffe-Bignoli *et al.*, 2014).

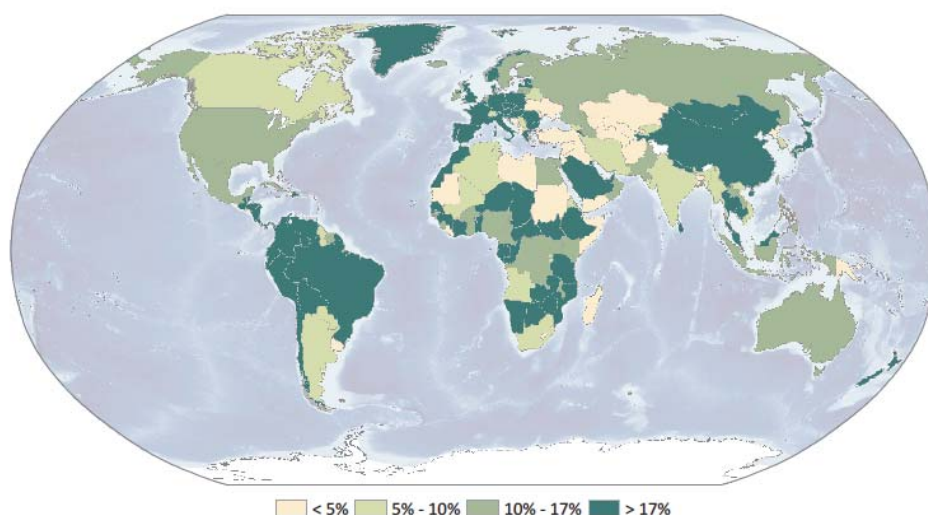


Figure 8: Levels of percentages (represented with shades of green) of protected areas per country

Source: Juffe-Bignoli *et al.*, 2014

According to the WDPA, by 2014 the marine and terrestrial PAs of all the countries (193 official countries) covered 18.8% of the world. Terrestrial PAs covered 14%, Antarctica 1.4% and coastal and marine PAs 3.4% (Deguignet *et al.*, 2014).

As mentioned earlier, the CBD with its Aichi Targets and the PoWPA with its goals support the increase of PAs. Although some of the targets may be considered ambitious, others have proved to be achievable (Leadley *et al.*, 2014). Among the ones that might be achieved is the Aichi Target No. 11, which envisages that by 2020 the percentage of protected terrestrial areas and inland water will reach 17%, and the protection of the coastal and marine areas will reach 10% (Leadley *et al.*, 2014; CBD, n.d.b).

Figure 9 illustrates the increase of terrestrial and marine PAs from 1990 to 2014. A broken line indicates Aichi Target No. 11. In the case of the marine PAs a significant increase can be observed from 2006. These figures and recent studies on the progress towards the Aichi targets suggest that if the tendencies continue, it might be possible to achieve Aichi Target No. 11 by 2020 (Leadley *et al.*, 2014).

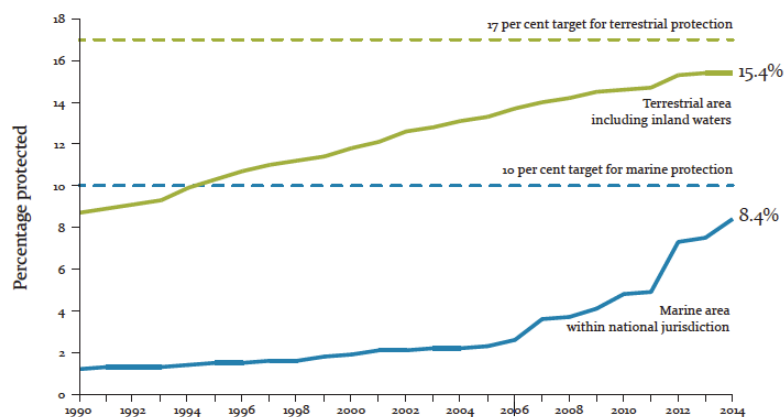


Figure 9: Percentage of land covered by terrestrial and marine protected areas from 1990 to 2014 in reference to the Aichi Target No.11

Source: Juffe-Bignoli, *et al.*, 2014.

The global growth of PAs requires large investments of resources (Chape *et al.*, 2005). PAs are limited by the available economic resources, which support

their management activities (Leadley *et al.*, 2014). When funding is not available PAs can become 'paper parks' or unsuccessful PAs, which lack effective management and are unlikely to deliver conservation goals. The existence of paper parks should not be the outcome of the growth of PAs (Geldmann, *et al.*, 2013). As Hoekstra, Boucher, Ricketts & Roberts (2005) suggest, effective management of existing PAs and strategic designation of new PA are crucial to achieve an efficient global system of PAs. To achieve effective management in PAs, monitoring and evaluation is necessary. Governments, NGOs, managers and other international institutions must find ways to monitor the improvements and deficiencies of individual PA. PAMEs can be an accessible method to monitor the effectiveness of the growing numbers of PAs.

2.4.4 Challenges facing protected areas

Despite of the growth in the number and size of PAs described above, the loss of biodiversity continues, habitats are being destroyed at excessive rates, and the viability of many species continues to decline (Jo Mulongoy & Chape, 2004; Dudley, Belokurov, *et al.*, 2004; Mora & Sale, 2011; LeSaout, *et al.*, 2013; UNEP, 2014).

PAs contribute to halting ecological pressures, however they only play a part in the complex endeavour for ecological conservation. PAs face many challenges of their own, which limit their ability to achieve their conservation goals. Some of the most relevant challenges are described in the following subtitles. The identification and the work on these challenges are crucial to achieve the effectiveness of PAs. PAMEs may be used as methods to identify which challenges are suffered by the PAs.

2.4.4.1 Management limitations of the protected areas

The reasons for the underperformance of some PA in achieving their conservation and management goals are complex. In some cases, they are related to external forces, and in other cases to internal deficiencies, which limit their success. One factor which can limit the success of PAs is the level of effectiveness of the management used to address their individual challenges (Anthony & Shestackova, 2015). Inappropriate management leads to inadequate protection of the resources (Carbutt & Goodman, 2013; Secretariat of the Convention on Biological Diversity, 2004).

The effectiveness of the management of the PAs can be constrained by the lack or misuse of funding. An insufficient budget prevents managers from implementing their management plans, when they have one. Technical deficiencies are another important issue. The lack of appropriate staff, equipment or management plans, legal tenure and other similar deficits tend to hamper integrated and efficient management (Brandon, Redford, Sanderson, 1998; Secretariat of the Convention on Biological Diversity, 2004; Jo Mulongoy & Chape, 2004).

In other cases, the lack of government support prevents PA managers from protecting their boundaries and territory from threats. Other issues that may affect PA management are the lack of funding for projects; insufficient research; inefficient coordination among stakeholders; inappropriate infrastructure and unsustainable tourism (McNeely & Miller, 1984; Secretariat of the Convention on Biological Diversity, 2004; Mora & Sale, 2011; Marino *et al.*, 2015). In such cases an enhancement of the management of PAs is required to improve their chances for the achievement of their conservation goals (LeSaout *et*

al., 2013). LeSaout *et al.* (2013) suggested that more attention is needed on improving the current management of existing PAs. They argued that existing weaknesses, pressures and threats of PAs and the unsuitable strategies for addressing them, are critical problems that need to be addressed. PAMEs could provide a solution for identifying management limitations and for guiding future improvements of management.

2.4.4.2 Inadequacies in the designation of protected areas

Major concerns have been expressed, that despite the rise in the number and sizes of PAs, their representativeness is not increasing (Venter *et al.*, 2014, WWF, 2015). A study conducted by Venter *et al.* (2014) estimated that 17% of the world's threatened species listed on IUCN's red list, are not found in PAs.

It is important that PAs are designated in areas where critical and vulnerable species, habitats and ecosystems are located. Also, their size and location must be appropriate to achieve their conservation goals (Jo Mulongoy & Chape, 2004; Venter *et al.*, 2014). PAs must be planned as systems, and where possibly connectivity between PAs should be prioritised to ensure migration of species, populations and genes (Jo Mulongoy & Chape, 2004; Jonas *et al.*, 2014). If these characteristics are not considered during initial phases of institutionalisation of the PAs, they will represent difficulties for achieving conservation goals later on.

2.4.4.3 Social pressures

PA also face social challenges. As their expansion increases, the interaction between humans and protected resources also grows. In some cases, the creation of PAs may provoke feelings of dispossession in the people in and around them.

This might incite pressures from communities who feel they have rights over the land. Furthermore, industries, developers and even government interested in exploiting the resources of the PAs can become threats to conservation efforts (Dudley, *et al.*, 2007).

Another social issue is the inequitable distribution of costs and benefits of PAs (Secretariat of the Convention on Biological Diversity, 2004). Difficulties have been identified in the processes of sharing the benefits generated by the conservation of resources (Marino *et al.*, 2015). Some PAs with poor community involvement lack agreements with local communities or staff, for the use of resources in the area. This promotes antagonism against the PA and disapproval among the locals (Secretariat of the Convention on Biological Diversity, 2004).

Other social threats are the human activities incompatible with conservation goals, unsustainable human population growth and rural poverty (Secretariat of the Convention on Biological Diversity, 2004; Mora & Sale, 2011). Some of these social threats can be addressed by an improvement of management, however, others are beyond the control of PA managers.

2.4.4.4 External pressures and threats

Other researchers and international conservation organisations suggest that PAs are not achieving their goals due to external threats and pressures. They argue that the most common threats and pressures faced by PA are due to human activities: such as the destruction of habitats by conversion, degradation or pollution; fragmentation of habitats; and illegal exploitation of the resources through poaching and illegal hunting and gathering (Secretariat of the Convention on Biological Diversity, 2004; Jo Mulongoy & Chape, 2004; Pimm, *et*

al., 2014). Some of these external threats can be addressed by effective management actions from the managers of the PAs, but they must be identified with tools such as the PAMEs.

Even though PAs face several challenges, there is evidence that proves PAs can achieve their conservation goals. PAs are halting forest clearing, protecting habitats and species, providing ecosystem services and providing more opportunities to expand the sustainable management of the resources (Secretariat of the Convention on Biological Diversity, 2008; Joppa & Pfaff, 2011).

Among the challenges discussed for PAs, only some of them can be identified and addressed with PAME evaluations. These evaluations can contribute to the understanding of what can be improved to enhance the internal management of the PAs to achieve the conservation objectives.

The efficient management of PAs is rooted in a thorough understanding of the individual conditions of each PA. Planning, monitoring and evaluation are necessary to ensure management activities are leading to positive changes (Nolte, Leverington, Kettner, Marr, Nielsen, Bomhard, Stolton, Stoll-Kleemann, Hockings, 2010). PAME assessments provide an opportunity for PA managers to evaluate and understand the situation of their PAs to improve regularly.

Chapter 3: Perspectives from the literature on protected area management effectiveness evaluations

This chapter will present the most recent global results and trends generated by the applications of the PAMEs. It will introduce four of the most commonly applied methodologies, which will be then be analysed in Chapter 5. Finally, this chapter will discuss the expected benefits that can arise from the applications of the PAMEs and the challenges that have been identified in the literature.

3.1 Global results of the protected area management effectiveness evaluations

The next section will present the most relevant results found by the global study on PAMEs conducted to analyse and compare the results generated by the implementation of PAMEs around the world. The following section will explain how these results and new ones are being used by the world database of PAs (WDPA) to identify trends in PA's management around the world.

3.1.1 First global study on protected area management effectiveness

According to the CBD (1992), it is not only important that the number of PAs continues to grow, but also that the management of the PAs becomes more effective over time. To identify improvements of the management of the PAs it was necessary to generate a baseline to monitor the changes. Hence, a global study of PAMEs was initiated in 2005. This global study was conducted with the

coordination of the World Wide Fund for Nature (WWF), The Nature Conservancy (TNC), the University of Queensland, the International Union for Conservation of Nature and Natural Resources (IUCN), the World Commission on Protected Areas (WCPA), the United Nations Environment Programme (UNEP) and the World Conservation Monitoring Centre (WCMC) (Stolton, 2008; Leverington, Hockings & Lemos-Costa, 2008; Leverington, Hockings, Pavese *et al.*, 2010).

The results of this study were published in 2008 and 2010. These results identified, reviewed and described the most commonly used methodologies. They compiled the existing results of more than 50 PAME methodologies applied around the world and developed a common reporting format to compare and analyse them. They also identified patterns and common situations among PAs; and generated global results (Stolton, 2008; Leverington, Hockings & Lemos-Costa, 2008; Leverington, Lemos-Costa, Courrau *et al.*, 2010).

The most relevant results of the global study indicated that the overall mean of the scores evaluating the effectiveness of PA management was 53%. Out of the six elements (proposed by IUCN's framework) evaluated by PAMEs, planning was the strongest in the majority of assessments. Overall PA management effectiveness was linked to adequate research, monitoring, good management planning, infrastructure, equipment, good administration, communication, adequacy of information and staff training. The top five threats identified at global scale were: biological resource use; agriculture and aquaculture; natural system modifications; human intrusion and disturbance; and residential and commercial development (Leverington, Lemos-Costa, Courrau *et al.*, 2010).

The study concluded that more efforts are needed to improve PA management. However, some assessments did show that PAs are conserving their values and contributing to their communities. Other conclusions suggest that numerous threats and the lack of basic requirements to operate in some PAs need to be addressed. Also, programs of research and monitoring within PAs should be enhanced. The support from funding institutions and governments needs to continue. Better policies, coordination and integration of stakeholders are required to improve management. Greater efforts should be directed to involve and benefit local communities. Visitor management has to be improved, and a proactive management capacity should be built.

The results of all PAMES analysed by the global study were translated into the common reporting format. And they were recorded in a PAME module of the Global Database of PAs (GD-PAME), administrated by UNEP's WCMC (Leverington, Hockings & Lemos-Costa, 2008; Stolton, 2008).

A description of 42 methodologies from all over the world was included in a supplementary report of the first edition of the study in 2008. This report includes a brief description of the methodologies, including: their origins; their developers; their purposes; objectives; application process; scoring and analyses procedures; strengths; constraints; weaknesses; a list of the indicators used; and a list references for further information (Leverington, Hockings, Pavese *et al.*, 2008). This report provides useful information about the methodologies. But it does not inform thoroughly on the characteristics of the indicators, such as their assessment approach (ordinal, nominal or mixed), the sources of information they require to be assessed, and other aspects, which might be useful for

potential users. Also the sections regarding strengths and weaknesses could be further improved.

Among the objectives of the global study, objective two aimed to “gain an understanding of the most appropriate methodologies for different situations and PA systems”. However, though the study presented a broad description of 42 methodologies, it did not provide recommendations on which situations certain PAME methodologies could be more useful. The study was limited to including a checklist with eight principles for selecting and adapting methodologies (Leverington, Hockings, Pavese *et al.*, 2008). However, these principles could be further improved to analyse more aspects of the methodologies, which could inform on characteristics related to their applicability. This thesis will try to address this gap in left in the study, by thoroughly comparing four PAME methodologies to identify the particular characteristics of their content, their indicators, and what makes them unique to suggest when they might be more appropriate based on their particularities.

3.1.2 Global trends on protected area management effectiveness evaluations

Thousands of PAME assessments have been conducted around the world since the nineties (Leverington, Lemos-Costa, Courrau *et al.*, 2010). Figure 10 shows the progress in different regions of the world. As it illustrated in Figure 10, the majority of countries have implemented PAMEs (Coad *et al.*, 2015; Juffe-Bignoli *et al.*, 2014). Nevertheless, it is important that they continue to be implemented since they are designed to be a continuous process, and countries with no assessments should start to undertake them (UNEP, 2014).

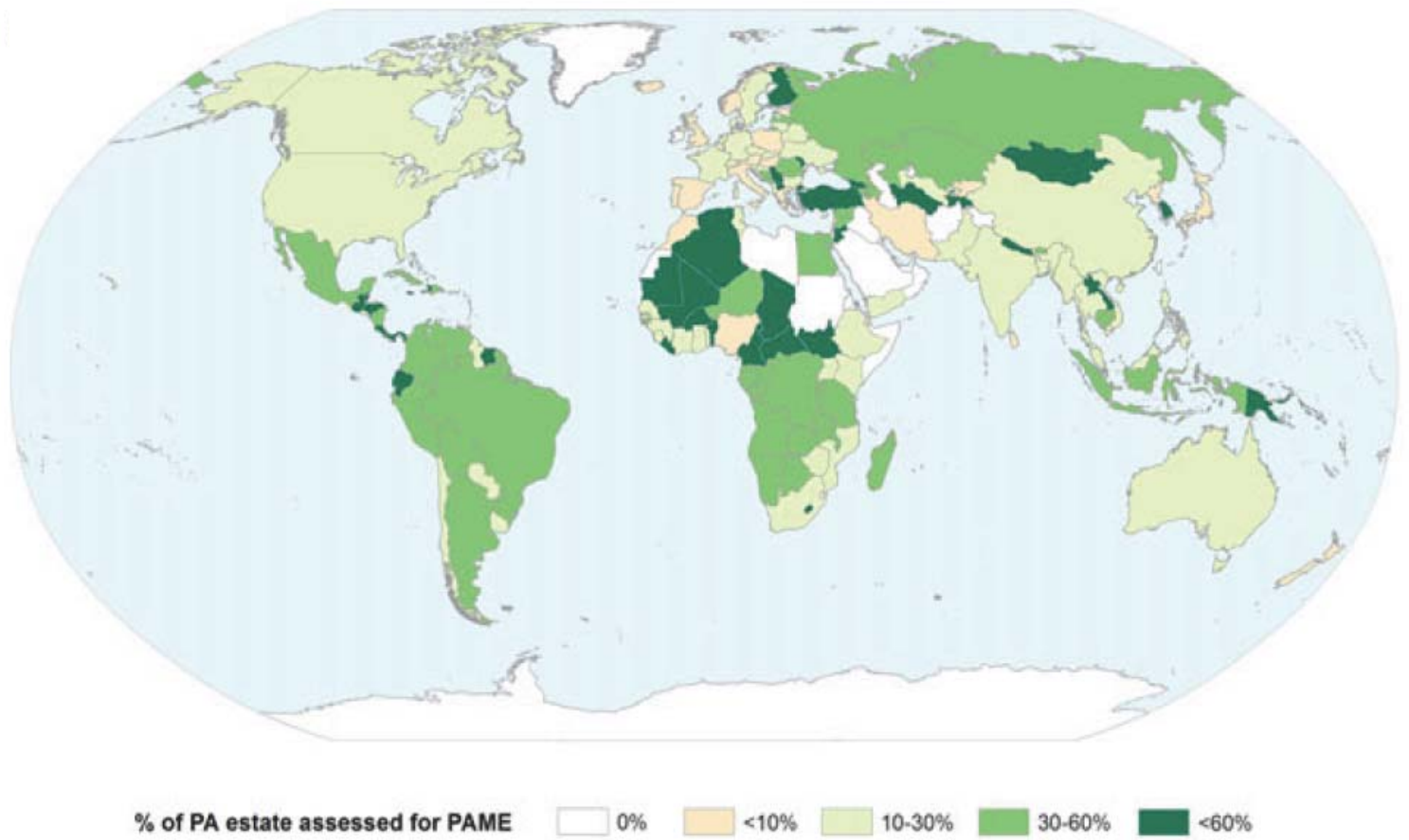


Figure 10: Global progress towards the implementation of PAME assessments in 2015

Source: Coad *et al.*, 2015.

Different efforts have been made to analyse PAME results. By 2015, approximately 18000 PAME had been recorded in the World Database of Protected Areas (WDPA) to measure the progress towards the achievement of the goals defined in the CBD and the PoWPA (Coad *et al.*, 2015). Other studies have also been undertaken to gather more data about PAME results (Leverington, Lemos-Costa, Pavese, 2007; Juffe-Bignoli *et al.*, 2014; Coad *et al.*, 2013 & 2015).

A study conducted by Coad *et al.* (2013) concluded that only 29% of PAs in the world have been assessed using a PAME methodology. They also found that of the signatory countries of the PoWPA, 23% have assessed 60% of their PA systems while 54% have failed to reach the 30% target. The study also identified biases in the categories of PAs assessed. Larger PA under designations, such as national parks or IUCN's categories I and II were more likely to have been assessed (as shown in Figure 11). Additionally, a slight tendency to evaluate older PA was also identified (Coad *et al.*, 2013).

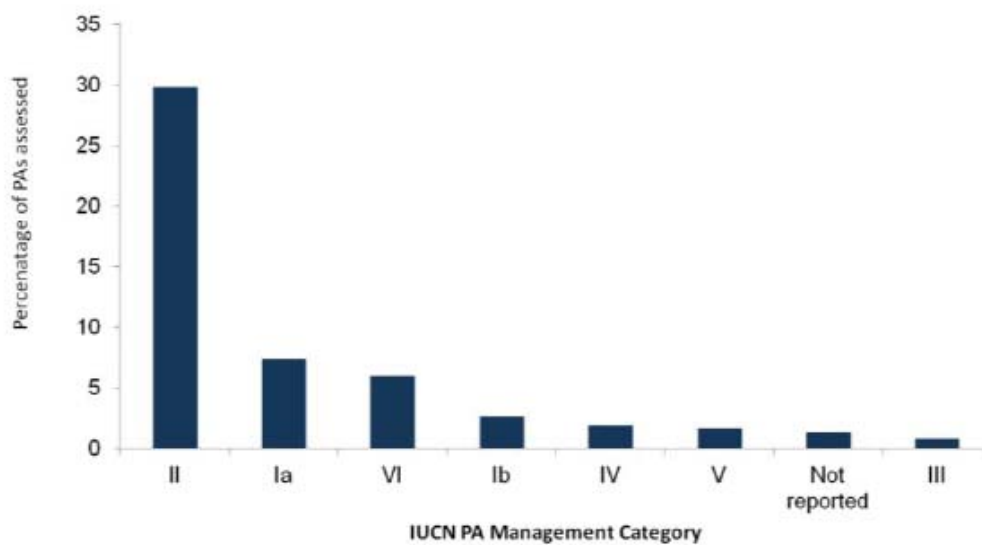


Figure 11: Global percentages of PAME assessments per IUCN's protected area category

Source: Coad *et al.*, 2013.

It was also noted that the institutions promoting the application of PAMEs have changed over time. Figure 12 shows that when the PAMEs began, they were led by the academia. Later NGOs took over and from 2005 onwards, the government agencies have led the processes. Coad *et al.* (2015) suggest this might be because government agencies are internalising them, due to their usefulness for improving management, planning, priority setting and reporting.

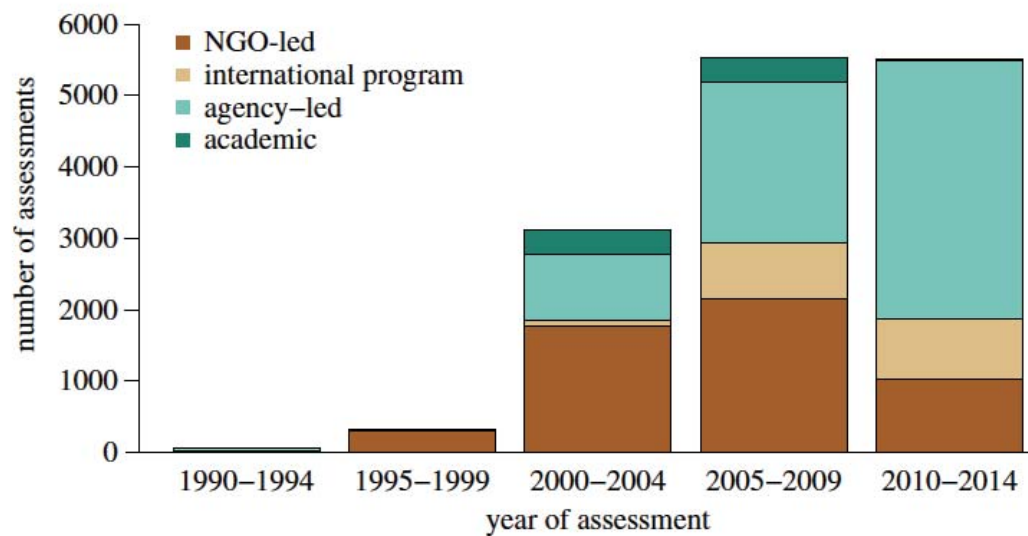


Figure 12: Application of PAME assessments from 1990 to 2014 according to implementing organisation

Source: Leverington, Lemos-Costa, Courrau *et al.*, 2010.

Coad *et al.* (2013) also found trends across regions. For example, Europe, the USA and Canada have had a paucity of assessments. They argued this might be because the evaluations of their PA management may be integrated into the PA planning and monitoring systems. Nonetheless, the lack of PAMEs in these countries creates difficulties for reporting to the CBD. In other regions where developing countries are located, such as Africa, Central and South America higher quantities of PAMEs have been conducted. Coad *et al.* (2013) suggest that it might be due to the presence of donor organisations, which support the implementation PAMEs. In the final results per continent, Africa had the largest percentage of PAs assessed with 44%. Central and South America, Asia and Europe reached the 30% target. Oceania achieved 17%; and North America assessed 3% (Coad *et al.*, 2013).

Figure 13 lists the different PAMEs used around the world. The graph shows the total number of assessments by region, with different colours indicating the methodologies used for the assessments. Oceania, Latin America and the Caribbean have conducted the greatest number of assessments. In the case of Oceania, Australia performed most of the assessments using the New South Wales State of Parks Evaluation. In Latin America and the Caribbean PROARCA/CAPAS and RAPPAM have been the most used (Leverington, Lemos-Costa, Courrau *et al.*, 2010).

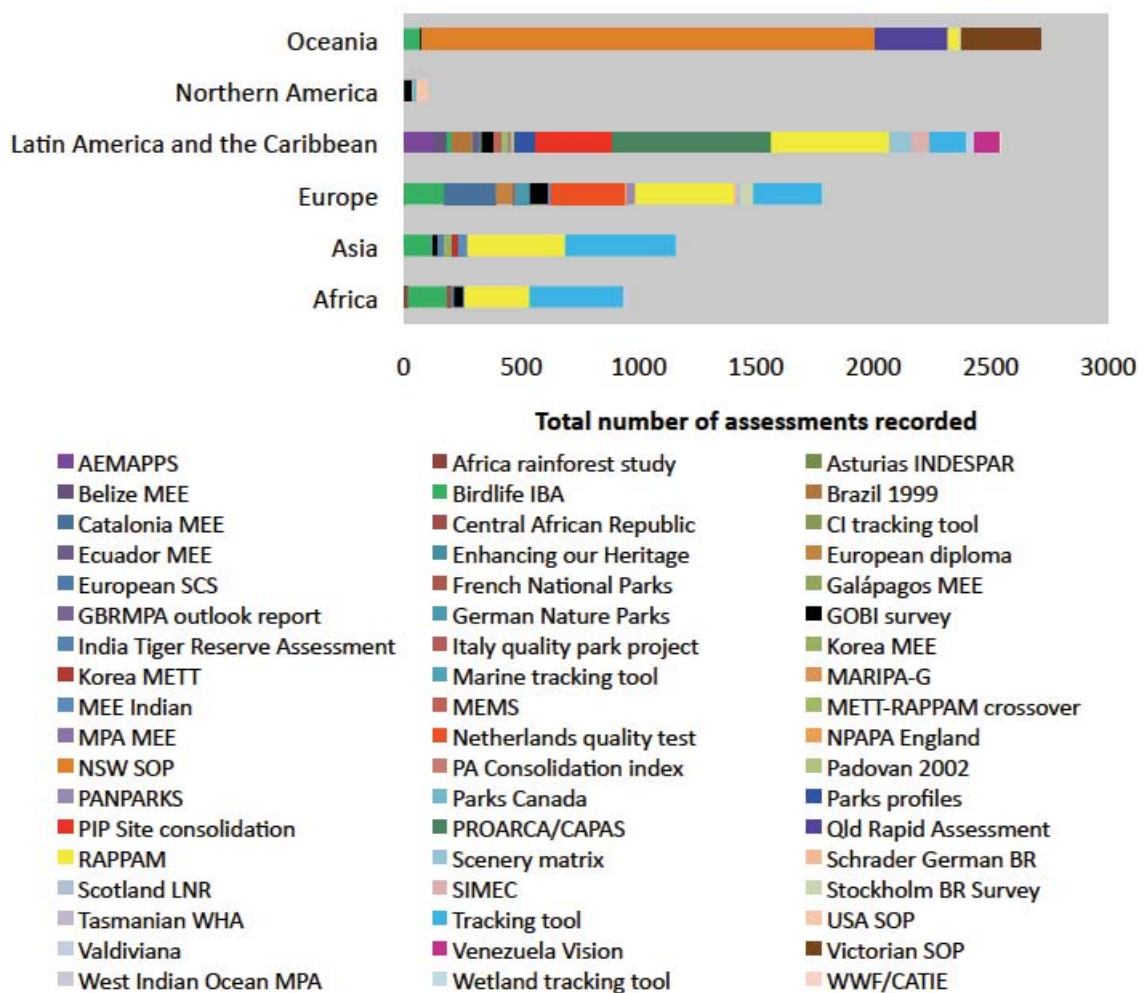


Figure 13: Methodologies of PAME assessments recorded by regions

Source: Leverington, Lemos-Costa, Courrau *et al.*, 2010.

The final results of the global study published in 2010, indicated the existence of 54 different methodologies used around the world for assessing management effectiveness (Leverington, Lemos-Costa, Courrau *et al.*, 2010). The study identified that by 2010 the most widely used methodologies around the world were: the Rapid and Prioritization of Protected Area Management (RAPPAM), the Management Effectiveness Tracking Tool (METT), ProArca/CAPAS scorecard evaluation for Central America, the Assessment of Important Bird Areas (IBA), the Site Consolidation Scorecard (SCS), and the New South Wales State of Parks evaluations for Australia (Leverington, Lemos-Costa, Courrau *et al.*, 2010; IUCN-TILCEPA, 2010). However, Coad *et al.* (2015) indicated that by 2015, the three most widely used methodologies were METT, IBA and RAPPAM. They also found that 95 different methodologies were recorded in the GD-PAME. This huge range of options of PAME methodologies may give rise to possible confusions for PA managers who do not know which option would be the most adequate to implement in their PAs. Therefore more information on PAME methodologies and their characteristics should be provided to potential users.

3.2 International methodologies for protected area management effectiveness evaluation (PAME)

Less than 15 methodologies have been used in several countries and are therefore considered international methodologies (Leverington, Hockings *et al.*, 2007; Leverington, Hockings, Pavese *et al.*, 2008; Stolton, 2008; Coad *et al.*, 2015). For the analysis conducted in this thesis four of these international methodologies were selected, following a set of criteria described in Section 4.3.1.

Previous studies have provided descriptions of these methodologies (Leverington, Hockings, Courrau, Pavese, Lemos-Costa, 2007; Leverington, Lemos-Costa, Pavese, 2007; Leverington, Hockings, Pavese *et al.*, 2008; Stolton, 2008; Leverington, Hockings, Lemos-Costa, 2008; Stoll-Kleemann, 2010; Leverington, Lemos-Costa, Courrau *et al.*, 2010; Leverington, Kettner *et al.*, 2010). However, an in depth comparison has not been conducted yet. An introductory summary of the methodologies compared in this study is provided below.

3.2.1 Management Effectiveness Tracking Tool (METT)

METT is the most widely used methodology. According to Coad *et al.* (2015), it has been applied 4,046 times in 2,045 PAs in 124 countries. METT was developed by the WWF in 2003 and a revised version was published in 2007, which will be the one analysed by this study. METT is a rapid assessment with 30 indicators that assess conditions of the PA and its management. It also includes 52 indicators that assess possible threats. According to Stolton *et al.* (2007) and Leverington, Hockings, Pavese *et al.*, (2008), this methodology assesses five elements of the IUCN's framework. It focuses on context, planning, inputs and processes. It is considered too limited to allow detailed evaluation of outcomes. Its primarily objective is to help monitor and report on the progress towards the achievement of improvements in management effectiveness. It has mainly been used to analyse individual PAs. This tool has the flexibility to be modified to fit different contexts (Stolton *et al.*, 2007).

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

RAPPAM had been applied 2276 times in 1930 PAs in 65 countries (Coad *et al.*, 2015). RAPPAM was developed by the WWF in 2000 with the objective of offering a tool capable of generating broad-level comparisons among PA networks or systems. The tool can be applied in one or any number of PAs to conduct comparisons. However, the developers of the tool argue that tool was not designed to provide detailed site level information. According to its description, it covers all six elements of the IUCN's framework. It uses 92 indicators to generate an overall score of individual PAs and it offers 30 extra indicators to analyse and compare PA systems (Ervin, 2003).

3.2.3 Enhancing our Heritage Toolkit (EoH)

EoH has been used in 16 PAs in 13 countries in Africa, Latin America and Asia. There was no information found on the number of applications of this methodology, however it was listed among the 15 most used by Coad *et al.*, (2015). This toolkit was published in 2008 by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) to improve the effectiveness of the management of World Heritage Sites (WHS). According to Hockings *et al.*, (2008) the assessment covers all six elements of the IUCN's framework. It uses twelve tools with qualitative and quantitative data to evaluate the six elements. Some tools generate scores whilst others do not. The application of the twelve tools is not compulsory, although they are recommended. Slight modifications can be made to adapt this tool to local circumstances (Hockings *et al.*, 2008).

3.2.4 Site Consolidation Scorecard (SCS)

The SCS has been applied more than 325 times in 83 PAs in 17 countries in Latin America, the Caribbean and Europe (Coad *et al.*, 2015). SCS was created by TNC in 1999 and it was updated in 2003 to ensure its compatibility with the IUCN framework. The aim of the SCS is to measure the progress towards the consolidation of functional PAs and to contribute to adaptive management (Martin & Rieger, 2003). According to Martin & Rieger (2003), the SCS covers five out of the six elements of IUCN's framework (like RAPPAM, it does not cover the outcomes element). It focuses on inputs and planning. The scorecard uses 16 indicators to assess its elements (Martin & Rieger, 2003). A European version of this instrument has been adapted and implemented. The variations are not major. The improvements include the re-writing of some indicators to enhance readability and the inclusion of 3 additional indicators (Pfleger, 2007). However, the version from 2003 will be analysed in this study.

PAMEs in general, strive to enhance the management of PAs. Even though they some have flaws, which will be discussed in section 3.4, they can provide useful results, as demonstrated by the global study on PAMEs and as it will be explained in the following section. Understanding the potential of the methodologies and what they are good for may enhance their applications and results. As Stoll-Kleemann (2010) pointed out, more information about PAMEs should be made available.

3.3 Benefits of protected area management effectiveness evaluations

PAMEs should be used as a management tool, regularly applied to monitor and improve management. These evaluations should be rapid and cost-effective, providing an opportunity to identify the effectiveness of the current management and to guide future management strategies (Coad *et al.*, 2015). When applied properly, PAMEs provide the opportunity to build understanding about the strengths and weaknesses of PAs, and the processes and milestones achieved in the endeavour of their management (Worboys & Trzyna, 2015; Dudley *et al.*, 2007). They also generate valuable information that may be used for project planning and resource allocation. The regular use of PAMEs may also reveal trends that might be used to anticipate threats and opportunities, improving the chances of successful management interventions (Hockings, 2004).

The lack of knowledge about the current situation of some PAs limits the ability of managers to address the problems they face (Dudley *et al.*, 2007). The regular evaluation of management provides the opportunity to create feedback for future decision-making. PAMEs may be used as tools for monitoring and for generating recommendations to enhance the strategies of adaptive management, which is a management with a formalised learning process based on experiences (Dudley *et al.*, 2005; Hockings *et al.*, 2007; Growcock, Sutherland & Stathis, 2009; Getzner, Jugmeier, Pflieger, 2012; More & Hockings, 2013).

PAMEs help to identify areas of improvement. They provide insights into the strengths and weaknesses of the current management; and they help to identify the threats to the PAs and their management (Hockings *et al.*, 2007).

These evaluations should not be considered as performance assessments of individuals PA managers (Carbutt & Goodman, 2013). Rather, they are tools for reflections to improve future strategies (Getzner, Jugmeier, Pflieger, 2012).

When used properly, PAMEs become learning tools, which managers can reflect upon. They may also provide the opportunity to identify lessons learned, promoting a “positive process” of improvement (Reed & Eguny, 2012). Therefore, adaptive management may be implemented, using a circular process of learning from doing (Growcock, Sutherland & Stathis, 2009; Hockings *et al.*, 2007). Berkes (2010) refers to this process as a cycle of “action-reflection-action”, which is based on evaluations, actions and feedback.

PAMEs encompassing participatory approaches may help to improve the relationships between PAs and their stakeholders. The participatory approach allows neighbouring communities and other stakeholders to strengthen the management of the PAs by expressing their concerns. This generates a sense of belonging, which enables stakeholders to shape and share the PA’s values. It also opens a channel for communication and cooperation, where challenges and benefits can be discussed in an open way. This strengthens the relationships between the PA and the stakeholders, which in the long term may contribute to the reduction of threats. The inclusion of stakeholders in PAMEs also provides the opportunity for PA managers to reflect upon the management of the site from different perspectives (Hockings *et al.*, 2015).

PAMEs should be implemented regularly to promote periodical reporting. Regular assessments contribute to the improvement of local, regional, national and international accountability of PAs (Hockings *et al.*, 2007). PAMEs

may also provide internal accountability (Hockings, Cook, *et al.*, 2009). They promote transparency through the generation of up-to-date information about the activities, investments and achievements of PAs and their management, and allowing the sharing of this information by senior managers, funding institutions, communities, and other stakeholder groups (Hockings *et al.*, 2015). Thus PAMEs can contribute to confirming whether PAs are achieving their goals and providing services to the public. PAMEs may also be useful for proving to stakeholders such as industries or government agencies that PAs are not locking up valuable resources, or undermining economic and social development (Dudley *et al.*, 2007). PAMEs can help to identify the benefits and services that PAs deliver to society, and they can be used detect how these benefits and services can be improved (Worboys & Trzyna, 2015).

The results of PAMEs may also be used to decide on the future allocation of funds and to justify new approaches for management (Hockings, Stolton, & Dudley, 2007). The appropriate use of economic and human resources for the management of PAs is critical and has been identified as a limiting factor for achieving conservation outcomes (Mora & Sale, 2011). The information generated by PAMEs may contribute to better resource allocation by indicating the gaps and areas with the greatest needs (Hockings *et al.*, 2015).

PAMEs are also useful for the international institutions that support PAs. NGOs and other donors are demanding the implementation of PAMEs to oversee their investments. For example, the WWF, the World Bank (WB) and the Global Environmental Fund (GEF) require PAs with ongoing conservation projects, to conduct PAMEs as a prerequisite for their continued funding support (Cook, Carter & Hockings, 2014; Coad *et al.*, 2015). Other institutions such as the

International Union for Conservation of Nature and Natural Resources (IUCN) and the World Conservation Monitoring Centre (WCMC) are also interested in the collection of the data generated by the PAMEs to support the allocation of funds, priority setting and decision-making (Hockings *et al.*, 2002).

According to a recent study conducted by Coad *et al.* (2015), the results of PAMEs may potentially be correlated with the conservation outcomes of the PAs. This study analysed the link between PAME scores and conservation outcomes by assessing the results of peer-reviewed papers. The study found that five out of nine studies identified a positive relationship between PAME scores and biodiversity outcomes. These results are not sufficient to conclude all PAMEs scores may be linked to conservation outcomes. However, a global data set of PAMEs may potentially provide an opportunity in the future, to measure the link between the long-term impacts of PA management and biodiversity conservation outcomes, at a global scale (Coad *et al.*, 2015).

Despite the various benefits associated with the application of the PAMEs, the literature also identifies a number of flaws, which may hinder their capacity to be successful. The challenges faced by PAMEs are discussed below.

3.4 Challenges for protected area management effectiveness evaluations

PAMEs are not a flawless approach. Rather, PAMEs face several challenges, which may reduce their validity. However, acknowledging these problems may help to address them. This section will present nine of the main challenges faced by PAMEs at different stages, including during the selection of the methodology; its implementation; interpretation; evaluation; comparison and the adoption of the results into the decision-making processes.

3.4.1 Use of inappropriate methodologies, criteria or indicators

Choosing the right methodology, criteria and indicators to evaluate the condition of a PA is a challenge. The selection of a methodology should be informed by the objectives of the evaluation and the ability of the methodologies to provide the expected results. Descriptions and results of previous applications of the methodologies may inform the selection process (Hockings *et al.*, 2006; Hockings, Cook *et al.*, 2009; Leverington, Lemos-Costa, Courrau *et al.*, 2010). The use of the “checklist for good evaluation methodologies” provided by Leverington, Hockings, Pavese, *et al.*, (2008) may also be used as a tool to select an appropriate methodology.

The selection of the criteria and indicators to be included in a new or adapted methodology must be done with diligence and bearing in mind what is expected from the evaluation. Inappropriate criteria and indicators will hinder the achievement of the evaluation’s objectives, because they may not reflect the

complexity of the subjects measured providing inadequate results (Hockings *et al.*, 2006; Hockings, Cook *et al.*, 2009).

3.4.2 Balance between qualitative and quantitative indicators

A study conducted by Hockings (2003) analysed 27 PAME methodologies and found that methodologies relying mainly on quantitative indicators were more narrowly focused. On average, they only addressed 1.5 out of the six elements of IUCN's framework. In contrast, on average the PAME methodologies with qualitative data addressed 3.1 elements.

Each type of indicator has its own advantages. Quantitative indicators are less susceptible to the influence of subjective bias and they can be used for statistical analyses and inferences, but they can be time consuming to measure. However, they can be compared over time and space and allow comparing like with like. Qualitative indicators can allow for quicker collection of data, provide information that cannot be measured in numbers, such as realities and complexities that acknowledge the experience of managers and other stakeholders, and can be used when no quantitative data is available (Hockings, Cook *et al.*, 2009; Hockings, 2003).

A balanced mix of qualitative and quantitative indicators seems to produce better results, thus an appreciation of the usefulness of both approaches should be fostered (Phillips, 2000; Hockings, 2003; Hockings, Cook *et al.*, 2009; More & Hockings, 2013). The objectives of the assessment should guide the number and type of indicators used (Hockings, Cook *et al.*, 2009). Hockings, Stolton, *et al.* (2009) suggest the methodologies should choose their types of

indicators, not only based on the objectives of the evaluation, but also based on the elements to be assessed, the level of depth they are wanting to achieve, the available resources and data, scale, scope, time frame and the degree of data reliability required.

3.4.3 Indicators with limited scoring systems

Indicators have two limitations regarding their scoring systems. First, some indicators do not have the ability to cover all the possible answers within their scoring systems. They should be able to capture the complete range of possible responses and possible combinations of characteristics, which are being evaluated by the indicator. When the indicators do not achieve this, they become impractical (Hockings, Cook *et al.*, 2009). Second, many indicators tend to have relatively simple, subjective and ordinal scoring systems, which may facilitate their application. However, this approach may also call into question their reliability, because they do not validate or analyse the results. They rely completely on the sources of information used for the assessment, which in most cases are the PA managers, stakeholders and/or literature. Nonetheless, scoring systems could be improved by the compulsory triangulation of the information using monitoring data; research; counterfactual analyses; and other sources of information, for at least the crucial indicators (Coad *et al.*, 2015).

3.4.4 Lack of weighted scoring systems

Another potential problem in scoring systems is the weight each indicator is given in calculating the final score. It has been suggested that the indicators should be weighted relative to their importance (Anthony & Shestackova; 2015). Some methodologies present attempts for providing different weights for their

indicators, such as the METT, but this is not the case for all of the methodologies (Stolton *et al.*, 2007; Hockings *et al.*, 2008). Without a weighting system the final scores can provide a relatively coarse measure of the effectiveness, which may hide weaknesses in crucial aspects of management. Without weighted scores, PAs with weaknesses in major areas could be scored as highly as PAs with weaknesses in less crucial areas. Thus, it has been suggested that PAMEs should use aggregated or weighted scores (Anthony & Shestackova; 2015).

3.4.5 Limitations on the implementation processes

The implementation and success of PAMEs may also be affected by several constraints not related to the methodology's design, but linked to the implementation process. Some of these constraints include time frames; facilitators' and staff's expertise; lack of systematic data collection; and the number of participants and their role. Other variables that may also affect the reliability of PAMEs' results are the institution funding the PAME, the institution leading the PAME; managerial challenges; lack of transparency; and even corruption (Anthony & Shestackova, 2015; Carbutt & Goodman, 2013; Coad *et al.*, 2015). To improve credibility, Coad *et al.* (2015) suggest it is fundamental to: standardise and apply operating guidelines; train the facilitators; carefully select the participants; and pre-determine a procedure plan and the duration of the assessment.

3.4.6 Reliability of the data

PAME methodologies are often criticised as 'soft science' as they primarily rely on the judgement of managers, experts and stakeholders. The issue lies in the fact that their judgements might be subject to bias towards one-

sided opinions and perspectives, or they could be misinformed. Additionally, the self-assessment nature of PAMEs raises questions of reliability (Carbutt & Goodman, 2013; Coad *et al.*, 2015; Cook *et al.*, 2014; Hockings, Cook *et al.*, 2009; Stolton *et al.*, 2007).

Studies have been conducted in Australia to understand more about the accuracy of the judgment of the PA managers. They have compared their opinions with data collected in the field and they have concluded that the majority of managers provide relatively accurate data on biological elements, which are easy to identify. They also found that the level of local ecological knowledge was not directly related to experience, level of education, or gender (Cook, Carter & Hockings, 2014; Cook, Wardell-Johnson, Carter & Hockings, 2014). Although the results of the studies in Australia cannot necessarily be extrapolated, they do provide an insight into the accuracy of the judgment of managers (Cook, Carter *et al.*, 2014; Cook, Wardell-Johnson *et al.*, 2014). More studies are needed on this subject, but in the meantime, it is recommended that data collected by the PAMEs should be triangulated with other sources of information (Leverington, Lemos-Costa, Courrau, *et al.*, 2010).

While the information gathered from the managers' perspectives may be criticised as potentially biased, in some cases they may be the only sources of information when economic and human resources are limited and other evaluations cannot be conducted (Hockings, Cook *et al.*, 2009). The PAMEs that only require inputs from the managers of the PAs to be completed may be an accessible method to rapidly report on the progress towards the achievement of the management goals of the PA (Stolton *et al.*, 2007).

3.4.7 Inconsistency in interpretation of the methodologies

Another challenge arises when different facilitators and participants of the PAMEs interpret the methodologies' components in different ways. This may happen during the process of data collection or during the data analysis phase. To avoid inconsistencies and to reduce subjective interpretations during the evaluations and analyses phases, it is important to train the facilitators and to carefully follow the instructions and recommendations provided by the methodologies (Hockings, Cook *et al.*, 2009).

3.4.8 Lack of use of the results

More and Hockings (2013) suggest that the lack of integration of the PAMEs in the PA's management plans limits their success. When PAMEs are not part of a systematic plan, there is no certainty for the allocation of staff or resources for their implementation. In other cases, if they are implemented, they might have poor integration of their results into the management planning (Growcock *et al.*, 2009; More & Hockings 2013).

The lack of internalization of the PAMEs into broader management strategies results in a limited ability to undertake follow-up to the assessments. The PAMEs are supposed to facilitate adaptive management, but when the cycle of "action-reflection-action" is not internalised by the managers of the PAs, PAMEs are less likely to achieve their desired results (Berkes 2010; Growcock *et al.*, 2009). According to Growcock *et al.*, (2009) and Moore & Hockings (2013) understanding the concepts and owning the processes of the PAMEs at all levels of the PA management agencies are key elements of their success. To achieve ownership a reliable process must be developed and adopted by all participants;

and the promotion of a culture of learning should to be encouraged to endorse the acceptance of negative and positive results (Growcock *et al.*, 2009; More & Hockings 2013). Lessons learnt throughout the years of implementation of PAMEs have shown that leadership at all levels is required to fully benefit from them. PAMEs need to be institutionalized and adequate to the contexts to generate useful results. A consistent and appropriate dissemination of results is required for ensuring improvements in management (Growcock *et al.*, 2009).

3.4.9 Difficulty in comparing results among methodologies

A challenge faced by governmental and international institutions working with PAMEs, was to find a coherent method to analyse the data generated by the different methodologies used around the world (Anthony & Shestackova, 2015; Stoll-Kleemann, 2010). To address this challenge, Leverington *et al.* (2008 & 2010) compiled over 8,000 assessments done with 52 different methodologies and developed a common reporting format using 33 headline indicators. The indicators were categorised within the 6 elements defined by IUCN's framework, which enabled a common reporting format (Leverington, Lemos-Costa, Courrau *et al.*, 2010). The use of headline indicators allowed comparison between methodologies, establishing common areas of analysis, and identifying threats, strengths and weaknesses among all the results worldwide (Leverington, Lemos-Costa, Courrau *et al.*, 2010; Nolte *et al.*, 2010). However, the usefulness of this common reporting format is still under debate. Some believe that the lack of relative weightings for the indicators in the scoring system is a major weakness. It has been suggested that weights should be given to the indicators to improve their capacity to capture the different situations in the general analyses. Critical indicators should have higher weighting than those with less significance. This

might generate more accurate results for global studies (Anthony & Shestackova, 2015).

Despite the weaknesses associated with PAMEs, it is generally reported by PAME users that their results are useful (Growcock *et al.*, 2009). Perhaps, taking into considering the possible flaws that might arise during the processes of planning, implementation, analysis and use of the PAMEs, can contribute to their reduction.

Chapter 4: Research design

This chapter will describe the research design and methods of data collection and analysis used in this thesis. The research method selected to conduct this research was content analysis. This method allowed a systematic organisation, comparison and quantitative analysis of the data gathered from four international methodologies for conducting protected area management effectiveness evaluations (PAMEs). In particular, content analysis was used to analyse the: Management Effectiveness Tracking Tool (METT), Rapid and Prioritization of Protected Area Management (RAPPAM), Enhancing our Heritage Toolkit (EoH) and Site Consolidation Scorecard (SCS).

This chapter will define the problem addressed by this research, the aim of the research and its objectives. It will then describe the research approach used to achieve the objectives of the research, outlining the methods used to collect the data and the processes and analytic strategy used in the research. Finally, it will explore the limitations identified in the implementation of the research.

4.1 Problem statement

As discussed in Chapter 2, 193 countries have protected areas (Deguignet *et al.*, 2014). Of these countries, 192 are parties to the Convention of Biological Diversity (CBD). As such, they have committed to regularly evaluate the management effectiveness of their PAs (Convention on Biological Diversity, n.d.b; Secretariat of the Convention on Biological Diversity, 2004). However, the CBD does not define a universal PAME methodology to conduct these evaluations. Currently more than 90 PAME methodologies exist (Coad *et al.*,

2015). These methodologies differ, evaluating different components of management and using different sources of information to assess them. Therefore, they have different potential in terms of what they measure and how they measure it (Leverington, Lemos-Costa, Courrau *et al.*, 2010). The selection of which methodology to apply should be grounded on characteristics such as what aspects of management they evaluate, types of indicators and their applicability, sources of information required, inputs needed, evaluation approach and potential of results (Hockings, 2003; Hockings, Cook *et al.*, 2009; Leverington, Lemos-Costa, Courrau, *et al.*, 2010). However, there is a lack of detailed information on fundamental characteristics and differences among the methodologies, which limits managers' ability to make an informed selection.

4.1.1 Aim of the research

The aim of this research is to analyse the fundamental characteristics, similarities and differences of four of the most commonly used PAME methodologies, in relation to the IUCN's framework for the creation of PAMEs. The methodologies chosen for this comparative analysis were: the Management Effectiveness Tracking Tool (METT) (Stolton *et al.*, 2007); the Rapid Assessment and Prioritization of Protected Area Management (RAPPAM) (Ervin, 2003); the Enhancing our Heritage Toolkit (EoH) (Hockings *et al.*, 2008) and the Site Consolidation Score Card (SCSC) (The Nature Conservancy, 2003). This analysis will also identify characteristics of the indicators to assess their viability. The results of the research expect to inform potential users on future selections of methodologies and to generate recommendations about when these methodologies might be most useful.

4.1.2 Objectives

In order to achieve the research aim, this thesis had three objectives, to:

1. Identify and compare the themes, elements, criteria and indicators evaluated by the four methodologies to detect similarities and differences;
2. Identify and compare the approaches used by each methodology to assess their indicators;
3. Investigate the strengths and weaknesses of each methodology and provide recommendations to inform future selections.

4.2 Research method

Content analysis was the research method applied in this study. In particular, a structuring-deductive approach was taken. This research method involves conducting coding processes for identifying and categorising units of analysis, which can also be described, evaluated or measured descriptively. This research method can also count the frequencies of occurrences of themes, phrases and words to generate quantitative descriptions of the contents of the texts (Mayring, 2014; Krippendorff, 2013; Hancock, Ockleford, & Windridge, 2009). The structuring-deductive approach of the content analysis, filters particular aspects to generate a cross-section analysis of the material, using predetermined categories, which can be established based on the material analysed or based on existing theory (Hsieh & Shannon; Mayring, 2014). For this analysis, the IUCN's framework to develop PAME methodologies (Hockings *et al.*, 2006) was used as the basis to define the categories of analysis.

4.3 Data collection

The following sections will explain the process for the collection of the data required to complete the content analysis. It will explain how the four methodologies chosen for the study were selected and what parts of these methodologies provided the information for the analysis.

4.3.1 Selection of methodologies

Due to the large number of PAME methodologies, it was necessary to identify the most relevant and useful methodologies to compare. The objective in selecting which methodologies to analyse was to select those, which could be accessible and applicable to as many PAs as possible. As such, five criteria were used to determine the PAME methodologies selected for this analysis:

- **Frequency:** They had to be on the list of the 15 most used methodologies of the Global Database of PAMEs (GD-PAME). This criterion ensured the methodologies selected had already been used numerous times.
- **Focus:** They had to be primarily focused on the evaluation of the management effectiveness, to avoid comparing PAMEs that include the assessment of additional aspects of PA effectiveness.
- **Accessibility:** They had to be published by NGOs or international agencies and not by national agencies or academia. This criterion was selected to ensure the methodologies chosen were accessible to any user. Academic, national or regional methodologies might be subject to property rights and may be adapted to specific regions.
- **Breadth:** They had to be applied in more than ten countries located in two or more continents. This criterion allowed the selection of methodologies that had wider applications around the world. National or regional

methodologies were not of interest because this analysis aimed to compare international methodologies, which may be used by anyone in the world.

- Informants: They had to be conducted with the information provided by the PA managers and key informants and not by desktop reviews. This criterion contributed to the elimination of methodologies, which conducted the evaluations using the “best” available information; without site visits; and using expert reviewers, who determine the final results of the evaluation.

The only four methodologies that fulfilled all five criteria were: Management Effectiveness Tracking Tool (METT) (Stolton *et al.*, 2007); Rapid Assessment and Prioritization of Protected Area Management (RAPPAM) (Ervin, 2003); Enhancing our Heritage Toolkit (EoH) (Hockings *et al.*, 2008) and Site Consolidation Scorecard (SCS) (The Nature Conservancy, 2003).

4.3.2 Sources of data

Each of the four methodologies comprise a data-sheet, which is used to record general information about the PA, and a questionnaire that includes the indicators assessed to generate the overall evaluation of the effectiveness of management of the PA. These questionnaires were the sources of information for this analysis. The questionnaires presented a variety of numbers of indicators to be assessed. METT has a total of 82 indicators; RAPPAM 92; EoH 76 and SCS 16. RAPPAM presented an additional questionnaire with 30 extra indicators to compare PA within systems. However, these indicators were not included in the analysis since the other methodologies did not provide additional questionnaires

for the assessment of PA systems, thus comparison would not have been possible.

4.4 Data analysis

To conduct the content analysis on the information gathered from the methodologies' questionnaires, a working scheme was adapted from Mayring (2014). The scheme involves five phases illustrated in Figure 14. The first phase: "definition of the aims of the analysis" has been already addressed in sections 4.1.1 and 4.1.2, which outlined the aim and objectives of this study. The four remaining phases are explained in more detail in the following sections.

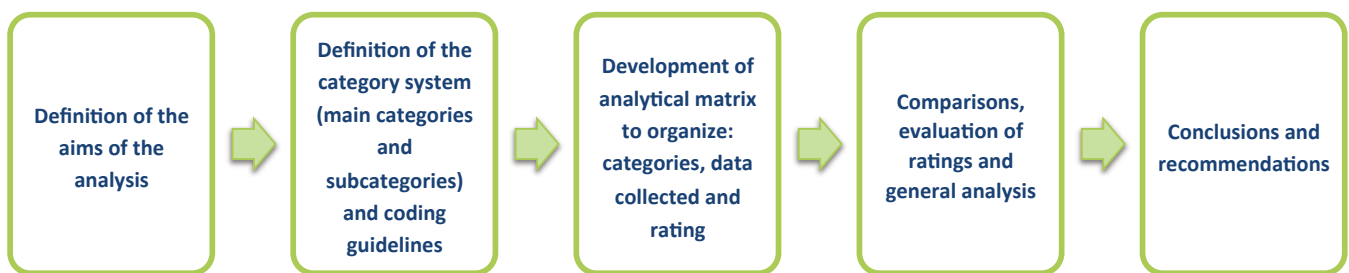


Figure 14: Working scheme for this research

Source: Adapted from Mayring, 2014

4.4.1 Definition of category system

The definition of the categories used to conduct the coding procedure is fundamental. Coding is the process of categorising, describing, evaluating or measuring units of analysis or codes (Krippendorff, 2013). To conduct this process, appropriate groups of analysis or categories applicable to all units must be defined. In keeping with what the literature on content analysis suggests, the categories of this study were created based on existing theory. The IUCN's

framework is the most relevant existing theory for the creation of PAME methodologies and therefore it was used to create the categories for this analysis (Hockings *et al.*, 2000; Hockings *et al.*, 2006; Leverington *et al.*, 2008; Jo Mulongoy & Chape, 2004; Secretariat of the Convention on Biological Diversity, 2004). As discussed in section 2.3.3, the IUCN's framework defines the themes, elements and criteria all PAME methodologies should include (refer to Figure 9 for a complete list of all of them). These themes, elements and criteria were utilised to develop a three level category system.

The first level consists of three categories, which according to the literature are the "themes": design & planning, adequacy & appropriateness of management systems and processes, and delivery of PA objectives. Each of these themes has two associated "elements" which together comprise the second level of sub-categories, which are: context, planning, inputs, processes, outputs, and outcomes. The third level consists of 36 sub-categories or "criteria", which are divided unevenly between the six elements (as shown in Figure 3). The three levels of categories and their organisation were defined by the existing theory. However, this analysis, distributed the indicators among the 36 criteria. To allocate them to the most appropriate criteria, the information provided by the methodologies and the descriptions included in the IUCN's framework were used as a guide (Leverington, Lemos-Costa, Courrau, *et al.*, 2010; Hockings *et al.*, 2006).

4.4.2 Development of analytical matrix

A matrix was developed for the analysis of the data collected. This matrix was used to organise the categories and to conduct the coding processes. Within this matrix two approaches were used to analyse the indicators. The first approach involved organising the indicators into the categories described above. This allowed the comparison of the indicators evaluated corresponding to each category. This analysis was nominal, as it was based on the classification of indicators into categories. The second approach used an ordinal scale of intensity with low-medium-high options (Taylor-Powell, 2008). It allowed the comparison of the indicators using the same scale (Mayring, 2014). This approach was used to rate and compare the types of sources of information required to assess the indicators and to rate and compare the level of detail captured by the indicators.

Part of the analytical matrix is illustrated in Table 2. The three levels of categories (themes, elements and criteria) were listed in the first three columns to the left of the matrix. The next four columns were used to list the corresponding indicators from each of the four methodologies analysed: METT, RAPPAM, EoH and SCS. The coding process distributed the indicators evaluating the same condition of the PA or its management into the same rows. When the methodologies did not include an indicator to evaluate that same condition n/a (not applicable) was inserted. A brief description of each indicator and how it is measured was included. The description of how the indicators are measured facilitated the identification of the types of approaches used for their assessment. The matrix also included the ratings of the level of input required to assess the indicators, based on the types of sources of information needed and the ratings for the level of detail of the indicators. The complete matrix is included in the Appendix 2.

Table 2: Example of part of the matrix for data analysis

		Methodologies compared				Indicators	
		METT	RAPPAM	EoH	SCSC		
		Enough people employed to manage the PA	The level of staffing is sufficient to effectively manage the area	Assessment of staff	Sufficient on-site personnel		
Levels of categories 1 st 2 nd 3 rd	Theme						
	Element						
	Criterion						
Adequacy and appropriateness		Staff					
Inputs		Staff					
Indicator	How is it measured	<p>Ordinal scale using:</p> <ol style="list-style-type: none"> Staff numbers are adequate for the management needs of the PA. Staff numbers are below optimum level for critical management activities. Staff numbers are inadequate for critical management activities. There are no staff. 	<p>Ordinal scale using:</p> <p>yes-mostly yes-mostly no-no</p>	<p>Nominal scale:</p> <p>List staff positions (including categories of temporary and permanent staff).</p> <p>Identify where staff are posted.</p> <p>Estimate number of required staff.</p> <p>Number of current staff.</p>	<p>Ordinal scale using:</p> <ol style="list-style-type: none"> Number of on site personnel sufficient to perform all planned management activities. Number of on site personnel adequate to perform basic management activities. On-site personnel able to perform some management activities. Some on-site personnel, not enough to adequately perform management activities. No on-site personnel. 		
Resources Detail		* +	* +	* +++	* +		
Indicator	How is it measured	<p>Staff adequately trained to fulfill management activities</p> <p>Ordinal scale using:</p> <ol style="list-style-type: none"> Staff training and skills are aligned with the management needs of the PA. Staff training and skills area adequate, but could be further improved to fully achieve objectives of management. Staff training and skills are low relative to the needs of the PA. Staff lack the skills needed for PA. 	<p>Staff members have adequate skills to conduct critical management activities</p> <p>Ordinal scale using:</p> <p>yes-mostly yes-mostly no-no</p>	<p>Staff training</p> <p>Ordinal scale using:</p> <ol style="list-style-type: none"> Very good: staff training and skills are appropriate for the management needs of the site and for anticipated future needs. Good: staff training and skills are adequate, but could be further improved to fully achieve management objectives. Fair: staff training and skills are low relative to the management needs of the site. Poor: staff lack the skills and training for effective site management. 	<p>n/a</p> <p>n/a</p>		
Resources Detail		* +	* +	* +	* +		

Three types of possible approaches used to assess indicators were identified: nominal, ordinal or mixed, as described in Table 3.

Table 3: Descriptions of types of approaches used by the indicators in METT, RAPPAM, EoH and SCS

Description of approaches for the assessment of the indicators
<p>Nominal: these indicators require the participants to create lists; to conduct strengths and weaknesses analyses; to define percentages or amounts of areas; or to provide explanations of the conditions assessed. These indicators do not inform scores, but they provide qualitative and quantitative information for general analysis of the PA’s conditions.</p>
<p>Ordinal: these indicators present a predetermined set of answers, from which the participants can select one option. Scores are awarded based on the answers selected to inform a final score for the evaluation.</p>
<p>Mixed: these indicators are assessed using nominal and ordinal approaches. The ordinal part of these indicators provides information based on a predetermined list of answers or ratings, and the nominal part provides qualitative and/or quantitative information.</p>

Three categories of possible sources of information were identified when reviewing the methodologies, each requiring different levels of inputs of time, financial and human resources. These three categories were given a rating level using an ordinal scale with low-medium-high options as described in Table 4. The allocation of categories was based on the minimum sources of information required to adequately assess a specific indicator. This rating system was useful for the identification and comparison of the different levels of inputs the methodologies require to be completed. Asterisks were used to indicate this rating in the matrix.

Table 4: Rating system for the types of sources of information required to complete the methodologies

Category of source of information	Rating on scale	Representation in the matrix
Key informants and literature: This category refers to the use of knowledge from PA managers, staff, stakeholders and available literature. These are the basic and key sources of information required to conduct PAMEs. No excessive funds or time are required to access these sources of information. These sources are available in the PAs and do not require additional human resources. They provide general information on the conditions of the PA.	Low	*
Monitoring: This category refers to the need for systematic monitoring, which requires medium to long-term periods of time, people in the field, data recording and analysis of data. Monitoring requires reasonable investments of time, human resources and funds. The information it provides is mainly used to quantify certain conditions of management and characteristics of the PA.	Medium	**
Scientific research: This category refers to the need for systematic research which is conducted with particular objectives, technology and experts. It may require significant time investments and funding. Experts with access and knowledge on specific technology are fundamental and in some cases accessing them might be expensive or time consuming. The information this category provides is explicit and precise, and it usually focuses on specific social, cultural or biological conditions of the PA and its values.	High	***

Each indicator was also rated based on the number of characteristics they evaluated using an ordinal scale with low-medium-high options, which are described in Table 5. This rating provides insight into how much detail is evaluated by each indicator, based on how many characteristics of the same condition they measure. The indicators with a low level of detail measure one characteristic, the medium level two or three characteristics, while the high level measure more than four characteristics in a single criterion. The level of detail of the indicators is represented in the matrix by sum signs.

Table 5: Rating system for the level of detail of the indicators

Description	Rating scale	Representation in the matrix
Assessment of one characteristic: these indicators evaluate one characteristic of the condition of the PA or its management. They provide a basic evaluation by assessing the minimum quantity of characteristics.	Low	+
Assessment of two or three characteristics: these indicators measure the conditions of the PA or its management evaluating two or three characteristics, which allow a wider assessment.	Medium	++
Assessment of more than three characteristics: these indicators evaluate more than three characteristics of the condition of the PA or its management, providing an ample perspective of the condition assessed.	High	+++

4.4.3 Comparisons, evaluation of ratings and general analysis

The analytical matrix facilitated the comparison of the themes, elements, criteria and indicators used by METT, RAPPAM, EoH and SCS. The differences these methodologies presented within the “theme” categories were summarised using tables similar to Table 6. These tables listed the elements and criteria included in the theme; presented the numbers of indicators METT, RAPPAM, EoH and SCS used to assess the theme and its criteria. It also included a final column with the percentage of criteria evaluated, in relation to the number of criteria suggested by the literature for that theme.

Table 6: Example of table for summarising results for “theme” categories

Theme	Adequacy and appropriateness																					
Element	Inputs				Processes																	
Criteria	Staff	Funding	Equipment and facilities	Information	Governance and leadership	Policy development	Administration, work programming and internal organisation	Evaluation	Maintenance of infrastructure, facilities and equipment	Staff training	Human resource management	Law enforcement	Community involvement	Communication, education and interpretation	Community development assistance	Sustainable resource use, management and audit	Visitor management	Restoration and rehabilitation	Resource protection and threat reduction	Research and monitoring	% of criteria evaluated	
Methodology																						
METT	2	2	1	1			5	1	1			1	3	1		1	2		1	1		70
RAPPAM	3	5	3	4			4	1	1	1		2	4				1				6	60
EoH	2	1	2	1			6	3	1	1	1	2	8	1	1		4		3	2		95
SCSC	1		1				2			1			1	1							2	35

The indicators were rated and compared to provide more information about them. The results of the two ratings used were summarised using stacked-column graphs, with colours representing each level (orange for high, yellow for medium and green for low). A final analysis of the total percentages of the levels of inputs and details in each methodology was conducted using pie graphs with the same colours. The comparisons of the types of approaches used to evaluate the indicators were also summarised using pie graphs.

The analysis of the number of indicators assessing each criteria and the level of detail of each of these indicators facilitated identifying which criteria constitute the areas of focus in each methodology. These criteria were the ones that evaluated the conditions of the PAs and their management, with the highest quantity of indicators and with the highest level of detail. The identification of

these areas was achieved through applying a value to the levels of detail identified for the indicators. The low level was given a weight value of one, the medium level of two, and the high level of three. The values were multiplied by the number of indicators in each level to generate a total weighted value for the three levels. Then, the low-medium-high weighted values were added and a final weighted value was awarded to that criteria. The criteria with the highest scores were identified as the areas of focus. For METT, RAPPAM and EoH four criteria were identified as areas of focus, while SCS was found to have three areas of focus.

The comparisons of the themes, elements, criteria and indicators were summarised in tables similar to Table 7. These tables facilitated comparing and contrasting the four methodologies; the number of indicators used to evaluate each criteria; the total number of indicators used by each methodology (highlighted in blue); the total number of indicators in each methodology with low, medium and high levels of detail; and the total number of indicators that require key informants and literature; monitoring; and scientific research to be assessed. The criteria highlighted with green are the criteria that all methodologies evaluate. The numbers highlighted with green are the criteria considered to be areas of focus.

Table 7: Example of table for summarising comparisons of themes, elements, criteria, numbers of indicators, level of detail, areas of focus and sources of information

Theme	Adequacy and appropriateness																	Level of detail			Sources of information					
Element	Inputs				Processes													Level of detail			Sources of information					
Criteria	Staff	Funding	Equipment and facilities	Information	Governance and leadership	Policy development	Administration, work programming and internal organisation	Evaluation	Maintenance of infrastructure, facilities and equipment	Staff training	Human resource management	Law enforcement	Community involvement	Communication, education and interpretation	Community developmentn assistance	Sustainable resource use, management and audit	Visitor management	Resource protection and threat reduction	Research and monitoring	Total indicators	Low level of detail	Medium level of detail	High level of detail	PA managers, staff, stakeholders' knowledge and literature	Monitoring	Scientific research
Methodology	Staff	Funding	Equipment and facilities	Information	Governance and leadership	Policy development	Administration, work programming and internal organisation	Evaluation	Maintenance of infrastructure, facilities and equipment	Staff training	Human resource management	Law enforcement	Community involvement	Communication, education and interpretation	Community developmentn assistance	Sustainable resource use, management and audit	Visitor management	Resource protection and threat reduction	Research and monitoring	Total indicators	Low level of detail	Medium level of detail	High level of detail	PA managers, staff, stakeholders' knowledge and literature	Monitoring	Scientific research
METT	2	2	1			1	5	1	1			1	3	1		1	2	1	1	82	64	18		43	31	8
RAPPAM	3	5	3			4	4	1	1	1		2	4				1		6	92	80	10	2	87	3	2
EoH	2	1	2			1	6	3	1	1	1	2	8	1	1		4	3	2	76	30	39	7	68	8	
SCSC	1		1				2			1			1	1					2	16	5	11		16		

4.4.4 Limitations

This study was limited to the analysis of four out of the numerous existing PAME methodologies. However, the approach used could be applied to conduct similar analyses and to compare other methodologies. It is important to note that there was a degree of subjectivity in the categorisation of the indicators and in the rating of the sources of information. In the categorisation of the indicators, the element of subjectivity appeared when the indicators showed characteristics of more than one criterion, forcing the researcher to chose the most appropriate criterion. To reduce this subjectivity, existing theory particularly, the descriptions of the methodologies and the IUCN's framework for the development of PAME methodologies was used as a guide. However, it was

found that IUCN's framework and other more recent publications lack an in-depth description of the criteria they suggest (Hockings *et al.*, 2015; Leverington, Lemos-Costa, Courrau *et al.*, 2010; Hockings *et al.*, 2006). Thus, the researcher analysed what the indicators evaluated and logic was used in the few cases where the allocation of indicators within the criteria categories was unclear. As Stoll-Kleemann (2010) observed, there is relatively little published information on PAMEs. It was found that there is lack of information regarding PAMEs in general, particularly on the descriptions of the criteria they evaluate. Subjectivity was also identified during the rating of the sources of information of the indicators. To reduce this subjectivity, it was assumed that whoever applies the methodologies wants to obtain the most accurate information, hence they have to use the most reliable sources of information to provide the most accurate data.

Chapter 5: Results

This chapter will present the results of the comparative analysis of four of the most commonly used protected area management effectiveness evaluations (PAMEs) methodologies: the Management Effectiveness Tracking Tool (METT); Rapid Assessment and Prioritization of Protected Area Management (RAPPAM); Enhancing our Heritage Toolkit (EoH) and Site Consolidation Scorecard (SCS). The chapter will be divided into three sections, which are the themes all PAMEs should address, according to the IUCN's framework: "design and planning", "adequacy and appropriateness of management processes", and "delivery of protected area (PA) objectives". Each section will show the number of indicators the methodologies use to assess the different themes, elements and criteria; and will present the analysis of the characteristics of the indicators, including their level of detail and the sources of information required to assess them. The final section of this chapter will provide a summary of the results to facilitate comparisons. All the results will be summarised using descriptive statistics. The frequencies, distributions and comparisons will be presented using column and pie graphs. For more detailed information on the comparison process, refer to Annex 2, where the matrix used for comparisons is shown.

5.1 Theme 1: Design and planning

This section presents the results generated for the first theme: "design and planning". It was found that METT evaluates 40% (4/10) of the criteria relating to this theme, RAPPAM and EoH evaluate 80%, (8/10) and SCSC evaluates 60%, (6/10) as presented in Table 8.

Table 8: Summary of the number of indicators used by METT, RAPPAM, EoH and SCS in relation to the elements and criteria within the "design and planning" theme

Theme	Design and planning										
Element	Context				Planning						
Criteria	Threats	Values and significance	Stakeholders attitudes and relations	Influence of external environment	Legal status	Tenure issues	Adequacy of legislation	Management planning	PA design	PA system design	% of criteria evaluated
Methodology											
METT	52				2			2	1		40
RAPPAM	2	14	5	9	2	1		8	5		80
EoH	1	1	7	5	1		1	15	3		80
SCS	1			1	1	1		2	1		60

There are two elements within "design and planning" theme: "context" and "planning". The "context" element should evaluate four criteria. METT only evaluates one of these, RAPPAM and EoH four, and SCS evaluated two. The number of indicators used to assess these criteria in each methodology is shown in Figure 15. "Threats" was the criterion with the highest number of indicators, followed by "values and significance" and "influence of external environment". The criterion "stakeholders attitudes and relations" had the least number of indicators. The methodology with the highest number of indicators relating to threats was METT with 52, followed by RAPPAM with 30, EoH with 14 and SCS with 2.

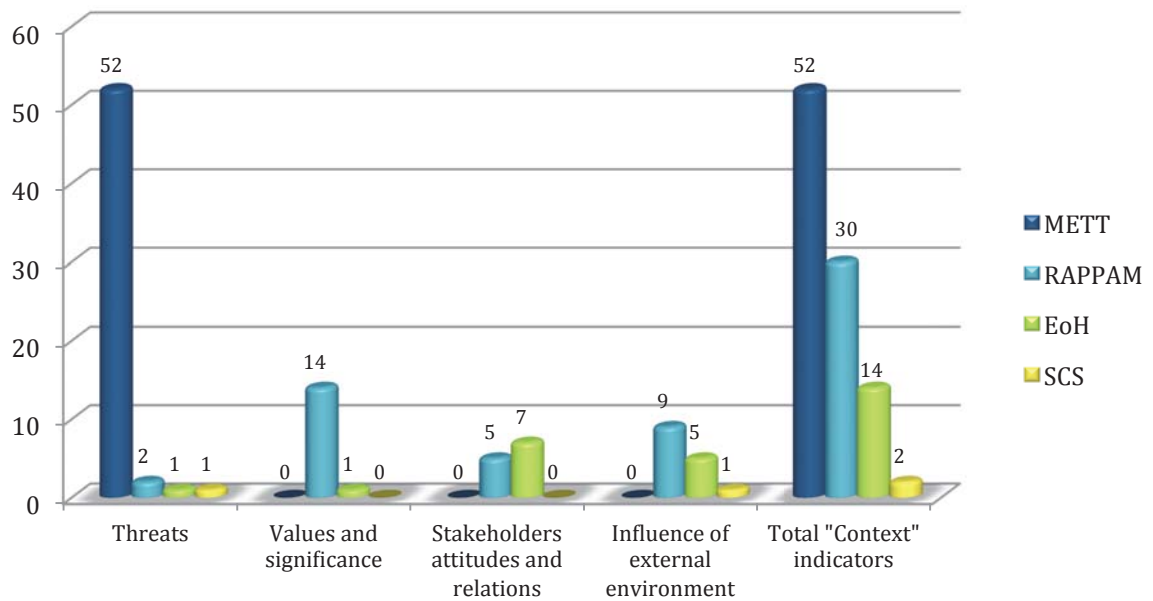


Figure 15: The number of indicators used by METT, RAPPAM, EoH and SCS to assess the four criteria relating to the "Context" element

The level of detail of the indicators for the "context" category is shown in Figure 16. 83.7% (82) of the indicators focus on analysing only one characteristic of the condition measured regarding the PA or its management. 13.3% (13) of the indicators analyse two or three characteristics and 3.1% (3) analyse more than three. RAPPAM and EoH are the two methodologies that incorporate the highest level of detail.

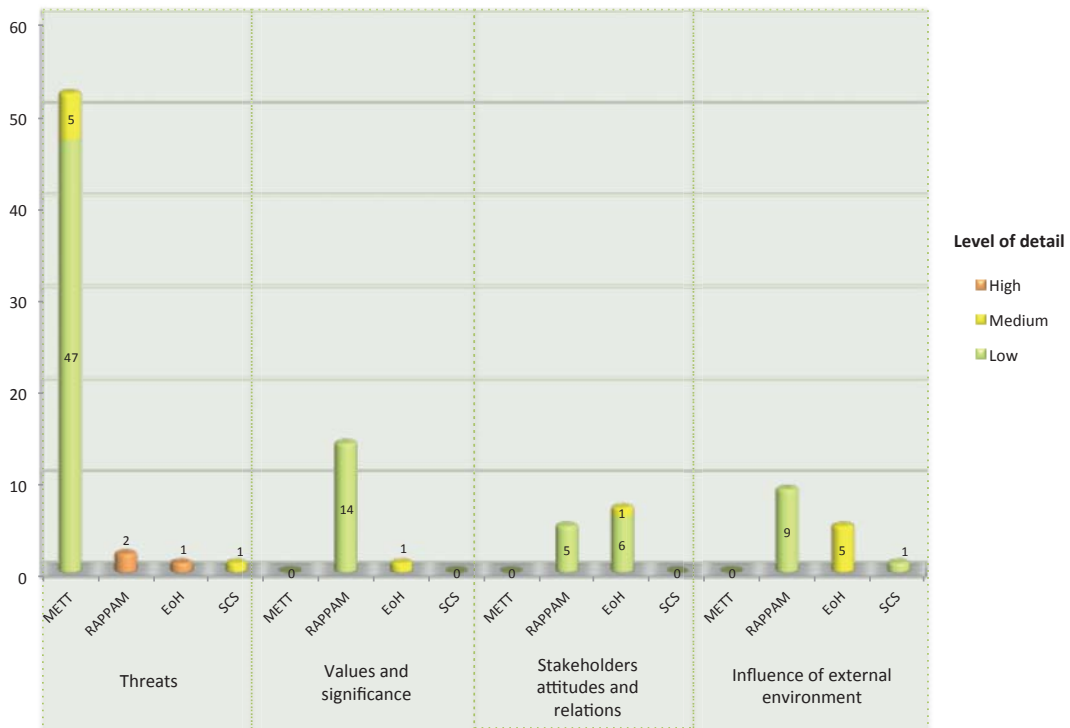


Figure 16: The level of detail of the indicators used by METT, RAPPAM, EoH and SCS to assess the four criteria in the "Context" element

The analysis of the sources of information for the “context” category presented in Figure 17, showed that 55.1% (54) of the indicators require the inputs of key informants and literature to be assessed. 34.7% (34) of the total indicators of this element require systematic monitoring to be evaluated; and 10.2% (10) require scientific research to collect accurate data.

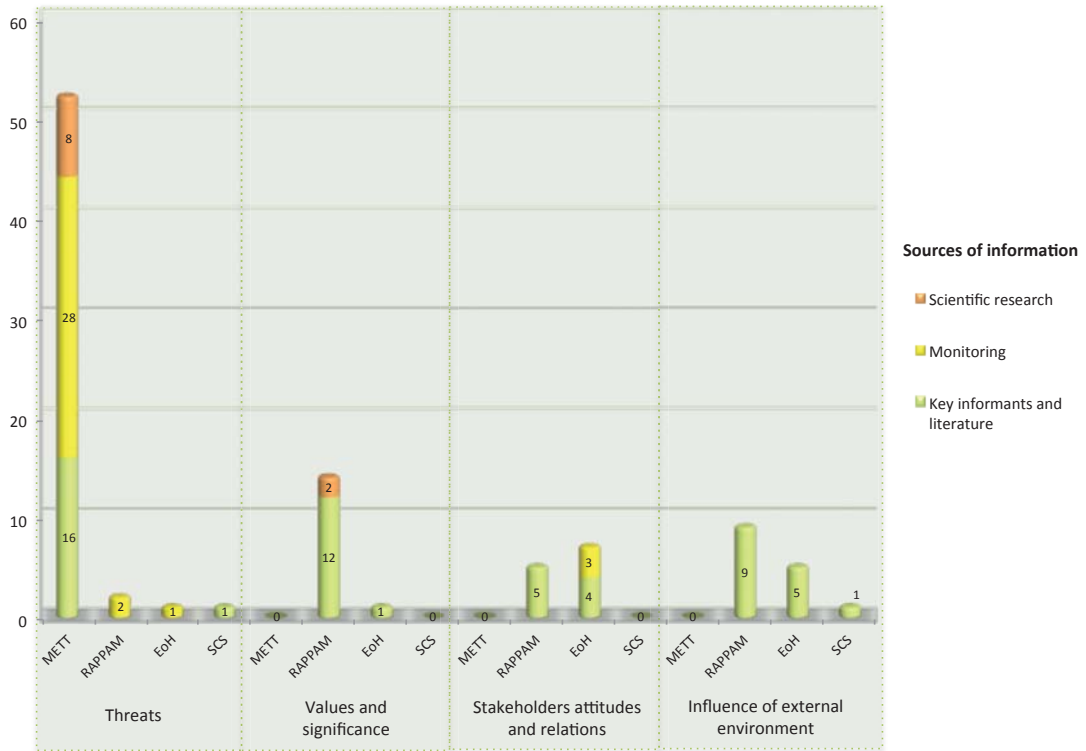


Figure 17: The sources of information required for assessing the indicators used by METT, RAPPAM, EoH and SCS to evaluate the four criteria in the "Context" element

The second element within the first theme: “design and planning” is “planning”. Six criteria should be evaluated in this theme. METT measures three of these criteria, and RAPPAM, EoH and SCS measure four. None of the four methodologies assess the criterion “system design”. The number of indicators used to assess the criteria in each methodology is shown in Figure 18. “Management planning” was the criterion with the highest number of indicators, followed by “PA design”.

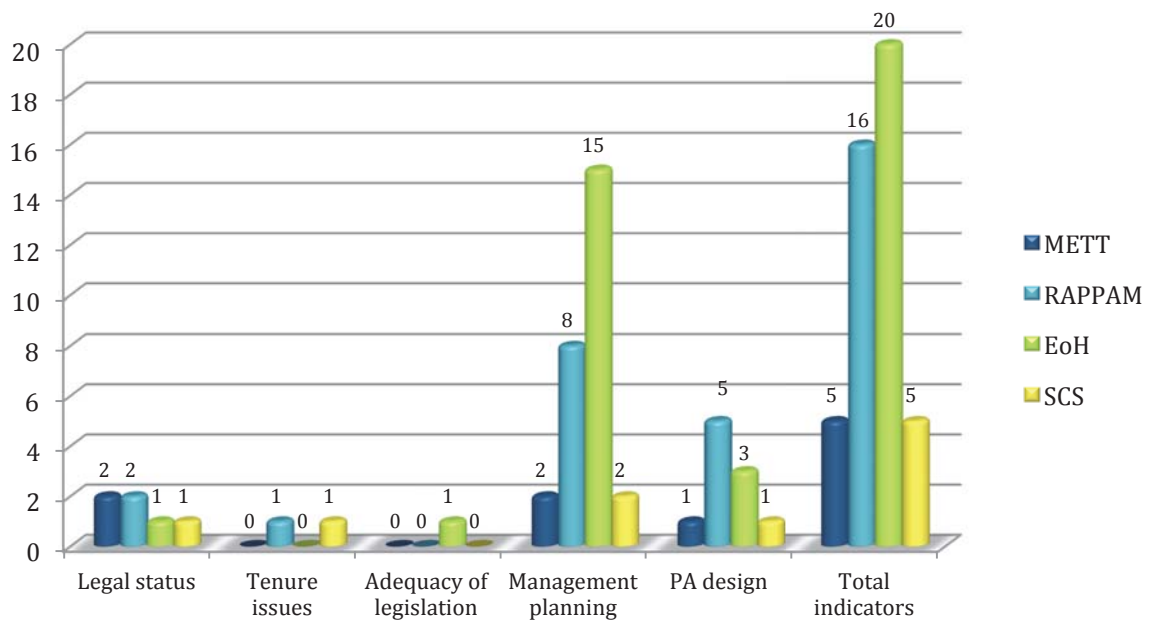


Figure 18: The number of indicators used by METT, RAPPAM, EoH and SCS to assess the five criteria relating to the "Planning" element

The analysis of level of detail for the "planning" category showed that 50% (23) of the indicators analyse one characteristic. 45.7% (21) of the indicators analyse two or three characteristics and 4.3% (2) analyse more than three characteristics, as shown in Figure 19. The only methodology with indicators that use a high level of detail in relation to the "planning" element is the EoH.

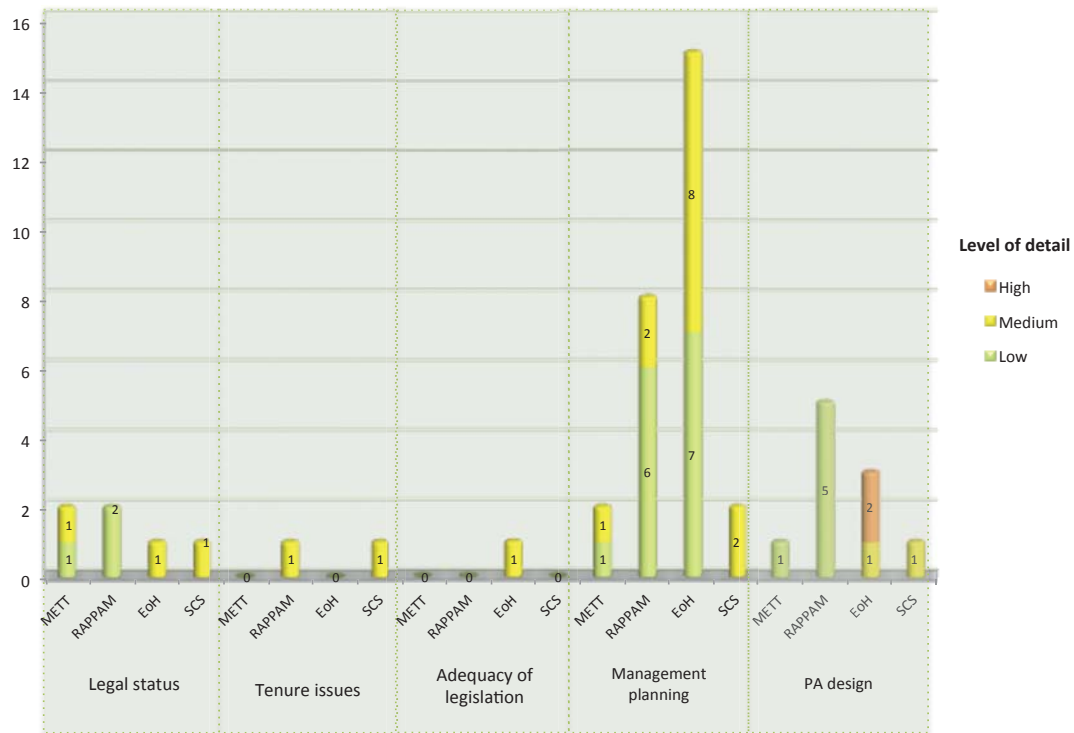


Figure 19: The level of detail of the indicators used by METT, RAPPAM, EoH and SCS to assess the five criteria in the "Planning" element

The analysis of the sources of information for the planning element illustrated in Figure 20, demonstrated that 97.8% (45) indicators require knowledge from key informants and/or literature to be assessed. Only one indicator in METT (representing the remaining 2.2%) requires monitoring to be assessed.

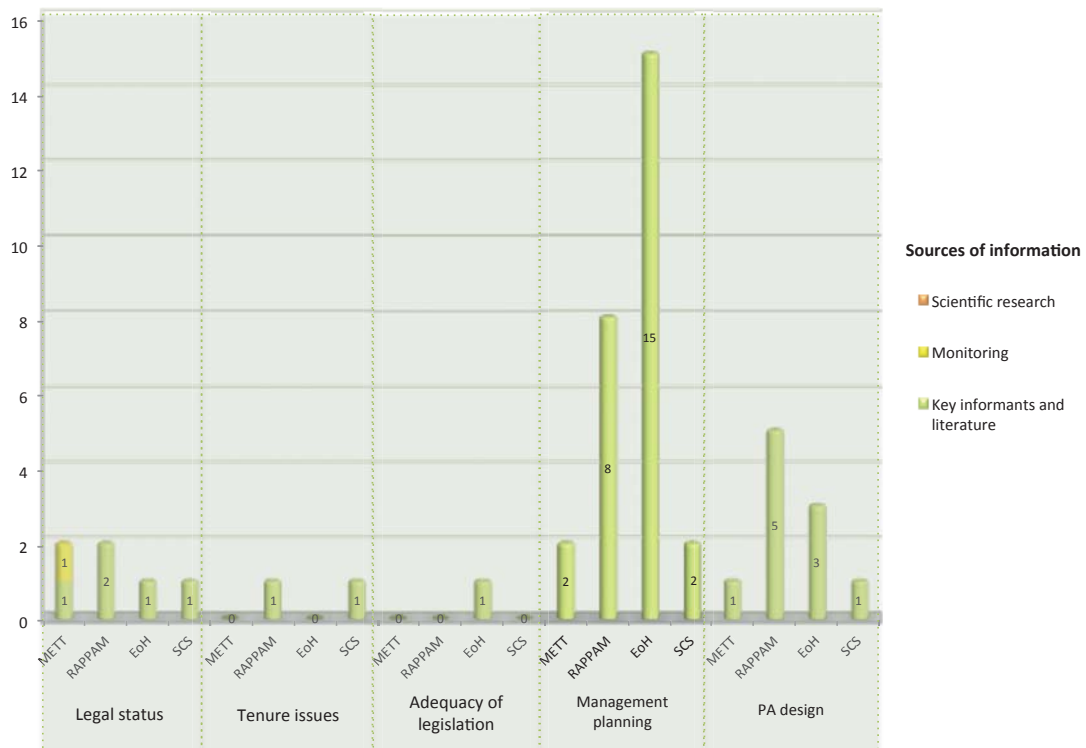


Figure 20: The sources of information required for assessing the indicators used by METT, RAPPAM, EoH and SCS to evaluate the five criteria in the "Planning" element

5.2 Theme 2: Adequacy and appropriateness of management systems and processes

The results for this theme indicated that three out of the twenty possible criteria to be assessed are not evaluated by any of the four methodologies. METT evaluates 70% (14/20) of the criteria of this theme, RAPPAM 60% (12/20), EoH 80% (16/20), and SCSC 35% (7/20), as shown in Table 9.

Table 9: Summary of the number of indicators used by METT, RAPPAM, EoH and SCS in relation to the elements and criteria within the "Adequacy and appropriateness of management systems and processes" theme

Theme	Adequacy and appropriateness of management systems and processes																				
Element	Inputs				Processes																
Criteria	Staff	Funding	Equipment and facilities	Information	Governance and leadership	Policy development	Administration, work programming and internal organisation	Evaluation	Maintenance of infrastructure, facilities and equipment	Staff training	Human resource management	Law enforcement	Community involvement	Communication, education and interpretation	Community development assistance	Sustainable resource use, management and audit	Visitor management	Restoration and rehabilitation	Resource protection and threat reduction	Research and monitoring	% of criteria evaluated
Methodology	Staff	Funding	Equipment and facilities	Information	Governance and leadership	Policy development	Administration, work programming and internal organisation	Evaluation	Maintenance of infrastructure, facilities and equipment	Staff training	Human resource management	Law enforcement	Community involvement	Communication, education and interpretation	Community development assistance	Sustainable resource use, management and audit	Visitor management	Restoration and rehabilitation	Resource protection and threat reduction	Research and monitoring	% of criteria evaluated
METT	2	2	1	1			5	1	1			1	3	1		1	2		1	1	70
RAPPAM	3	5	3	4			4	1	1	1		2	4				1			6	60
EoH	2	1	2	1			6	3	1	1	1	2	8	1	1		4		3	2	80
SCS	1		1				2			1			1	1						2	35

This theme has two elements: "inputs" and "processes". The analysis of the "inputs" element shown in Figure 21, indicated that two criteria: "staff" and "equipment and facilities" are measured by all four methodologies. The remaining two criteria are measured by METT, RAPPAM and EoH, but not by SCSC. RAPPAM is the methodology that measures this element with the highest number of indicators (15). METT and EOH use six indicators and SCSC use one.

The two criteria with the highest number of indicators are "staff" and "funding", both with eight indicators. "Information" and "equipment and facilities" follow with six indicators.

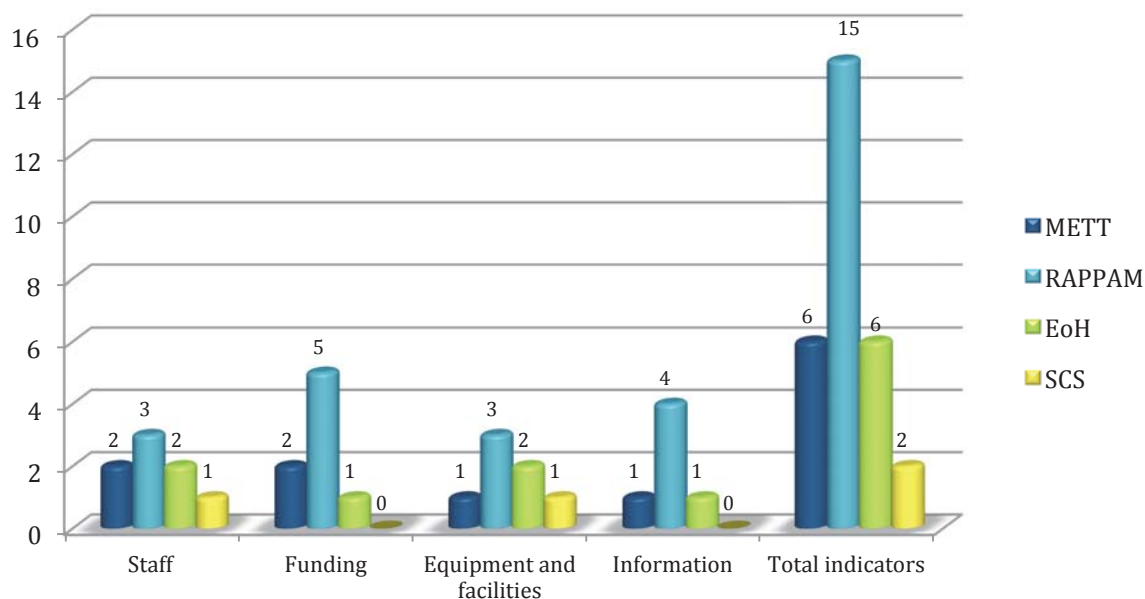


Figure 21: The numbers of indicators used by METT, RAPPAM, EoH and SCS to assess the four criteria included in the "Inputs" element

The analysis of the level of detail of the indicators in the "inputs" element shown in Figure 22, indicated that 82.8% (24) of the indicators are evaluating only one characteristic of the conditions assessed regarding the PA and its management. 10.3% (3) assess two or three characteristics. Both of these indicators were found in METT and EoH. Only 6.9% (2) of indicators evaluate more than three characteristics, obtaining a high level of detail. Both of these indicators were found in EoH. The only sources of information required for assessing all the indicators of the "inputs" element, are the available literature and key informants.

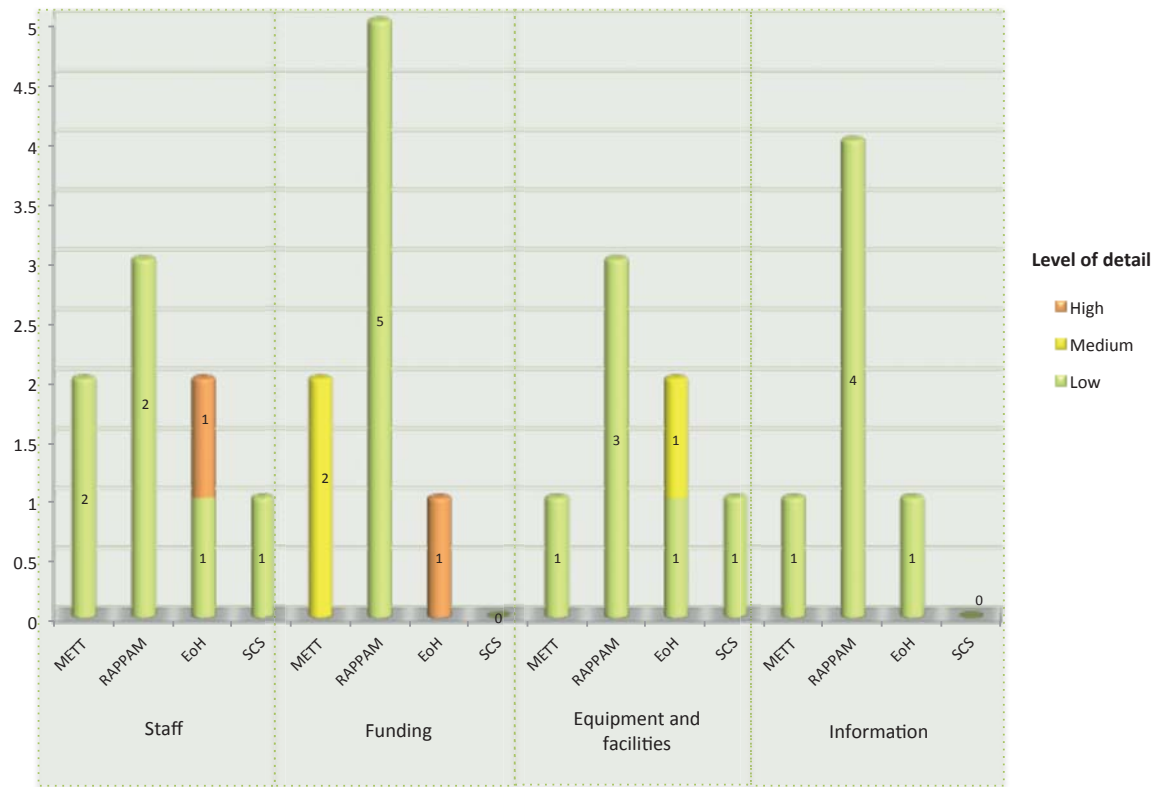


Figure 22: The level of detail of the indicators used by METT, RAPPAM, EoH and SCS to assess the four criteria in the "Inputs" element

The second element in the "inputs" theme is "processes". There are sixteen criteria within this element. However, only thirteen criteria are evaluated by the four methodologies analysed. The criteria not evaluated are "governance and leadership"; "policy development"; and "restoration and rehabilitation". This element presented the highest number of criteria and indicators, as shown in Figure 24. EoH is the methodology with the highest number of indicators, with 33, RAPPAM uses 20 indicators, METT uses 17 and SCSC uses 7.

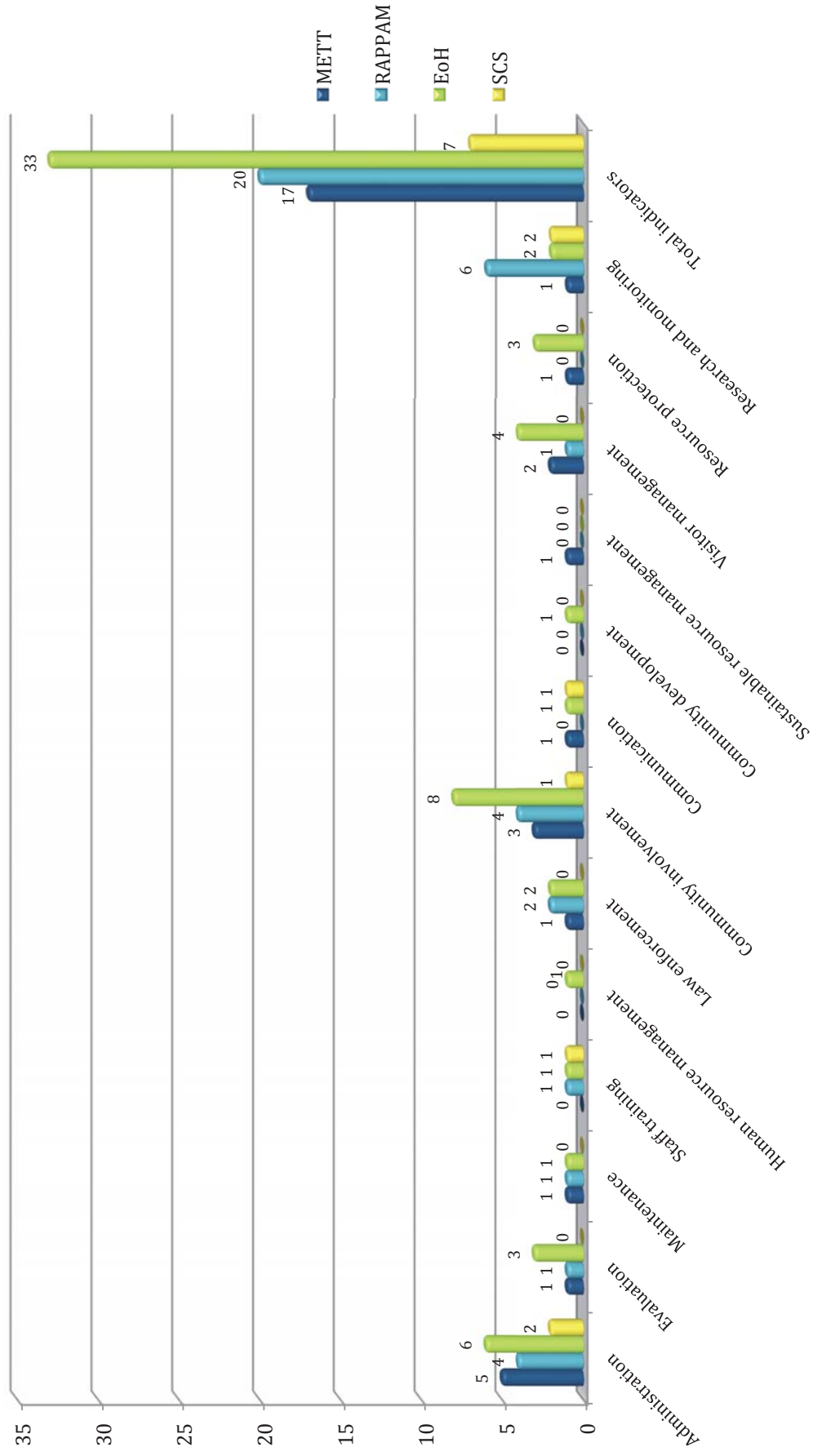


Figure 23: The number of indicators used by METT, RAPPAM, EoH and SCS to assess the thirteen criteria relating to the "Processes" element

The three criteria evaluated with the highest number of indicators are: “administration”, “work programming” and “internal organisation” with 17 indicators each; “community involvement” with 16 indicators and “research and monitoring” with 11 indicators. The criteria with the least number of indicators were: “human resource management”; “community development” and “sustainable resource management, use and audit”. The latter four criteria are only measured by one methodology and using a single indicator.

According to the analysis conducted of the level of detail, presented in Figure 25, 55.8% (43) of the indicators evaluate one characteristic. 42.9% (33) of the indicators evaluate two or three characteristics of the conditions of the PA and its management, providing a medium level of detail. And, 1.3% (1) indicator used by EoH assesses more than three characteristics.

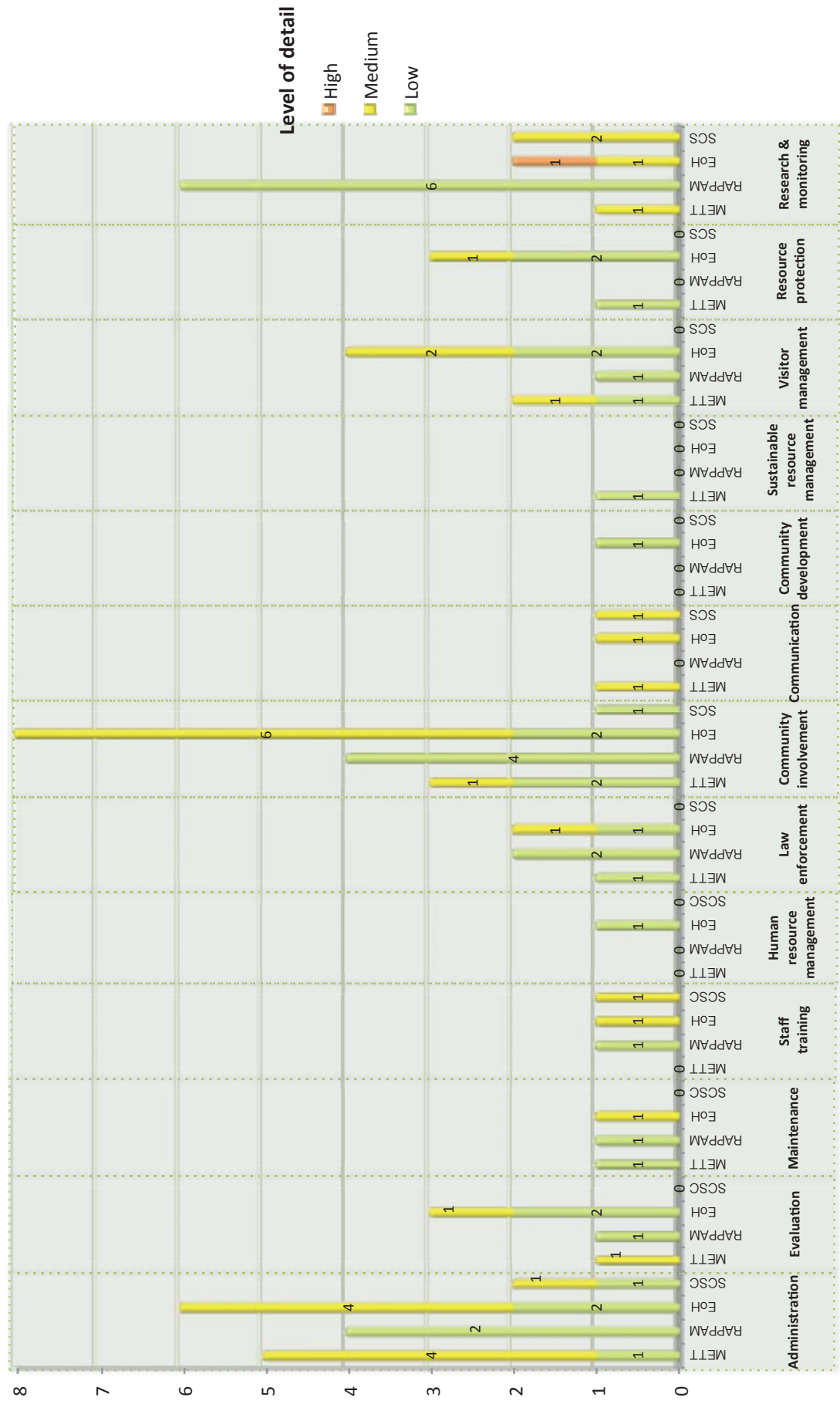


Figure 24: The level of detail of the indicators used by METT, RAPPAM, EoH and SCS to assess the thirteen criteria in the "Processes" element

93.5% of the indicators assessing the process element, only required key informants and literature, as shown in Figure 26. The only criterion that required monitoring to be assessed was “visitor management”. The three methodologies that assess this criterion: METT, RAPPAM and EoH, require monitoring for at least one of their indicators to be assessed.

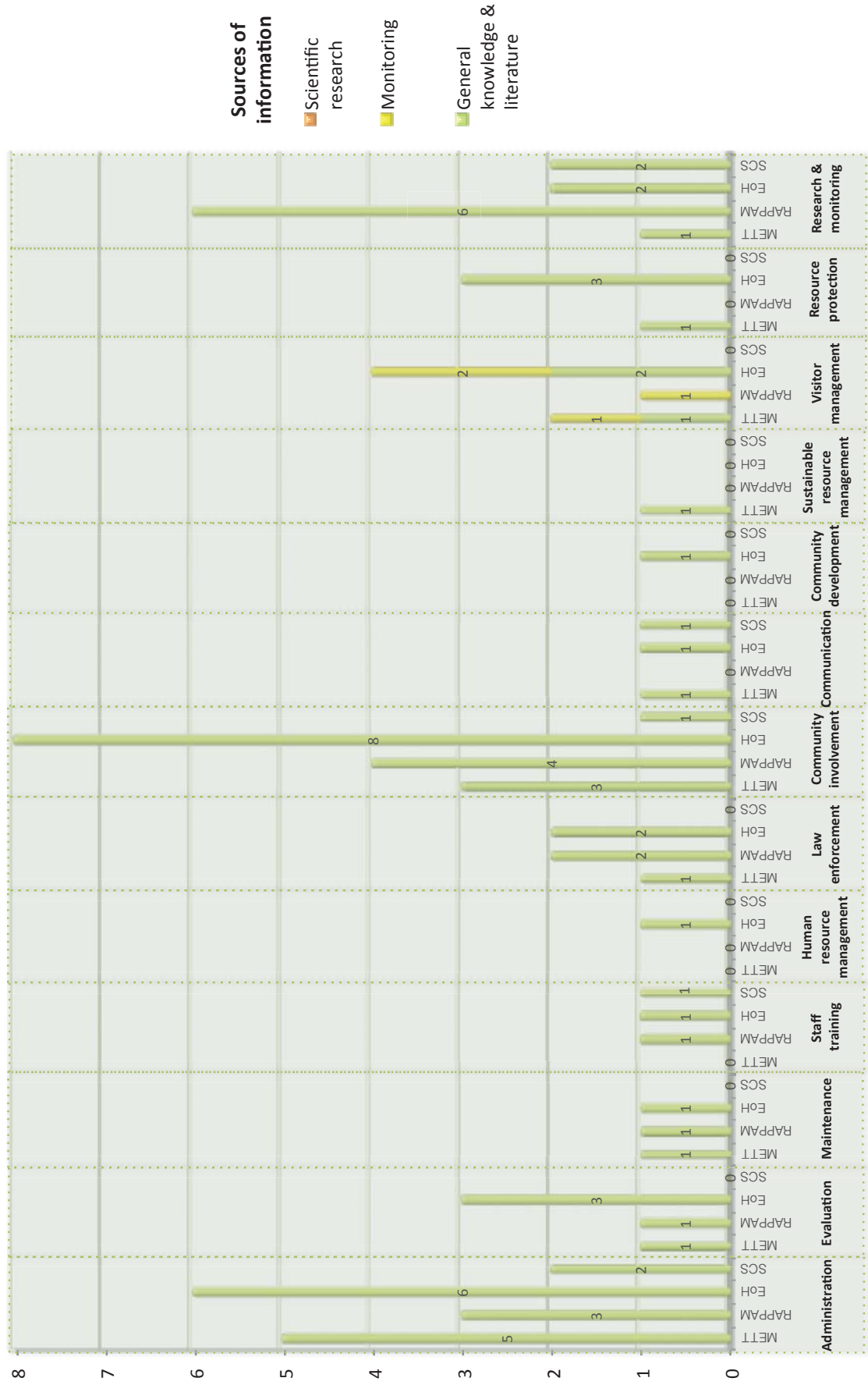


Figure 25: The sources of information required for assessing the indicators used by METT, RAPPAM, EoH and SCS to evaluate the thirteen criteria in the "Processes" element

5.3 Theme 3: Delivery of protected area objectives

This section presents the results for the third and final theme: “delivery of PA objectives”. The results showed that EoH evaluates both two elements of this theme; while RAPPAM and METT only evaluate one element; and SCSC does not evaluate this theme at all. METT and RAPPAM evaluate 33% (2/6) of the criteria of this theme, EoH 50% (3/6), and SCSC 0%, as shown in Table 10.

Table 10: Summary of the number of indicators used by METT, RAPPAM, EoH and SCS in relation to the elements and criteria within the "Delivery of protected area objectives" theme

Theme	Delivery of PA objectives						
Element	Outputs		Outcomes				
Criteria	Achieving work program	Outputs	Achieving objectives	Condition of defined values	Trends of defined values	Effect of PA on community	% of criteria evaluated
Methodology							
METT				1		1	33
RAPPAM	10					1	33
EoH		1		1		1	50
SCS							0

The theme: “delivery of PA objectives” has two elements. The first one is “outputs”. This theme includes two criteria “achieving work program results” and “outputs” criteria. As shown in Figure 25, the first criterion is only evaluated by RAPPAM using ten indicators. The second criterion is only evaluated by EoH using one indicator.

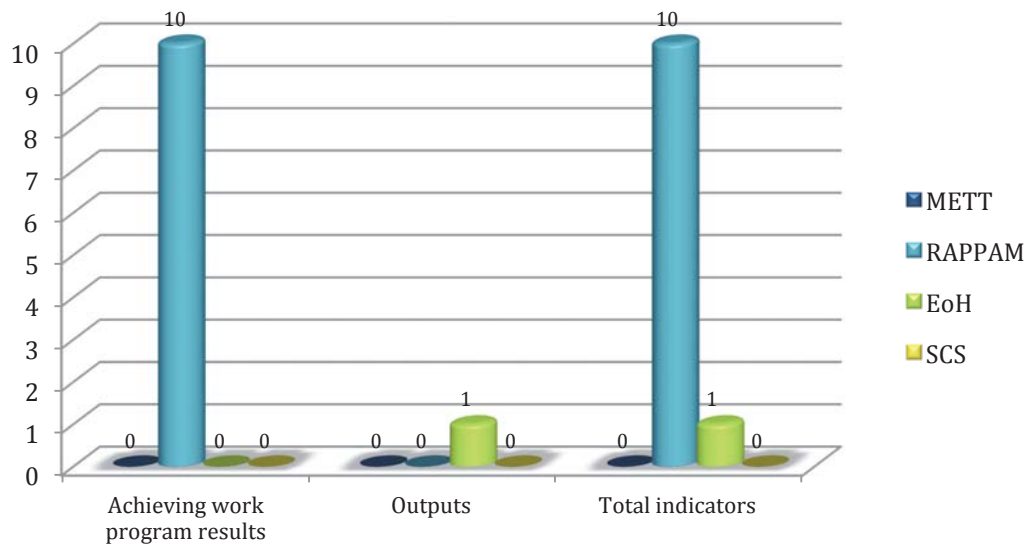


Figure 26: The number of indicators used by METT, RAPPAM, EoH and SCS to assess the two criteria relating to the "Outputs" element

The analysis of the level of detail showed that 30% (3) of the indicators used by RAPPAM have a low level of detail, and 70% (7) have a medium level. The indicator used by EoH also has a medium level of detail.

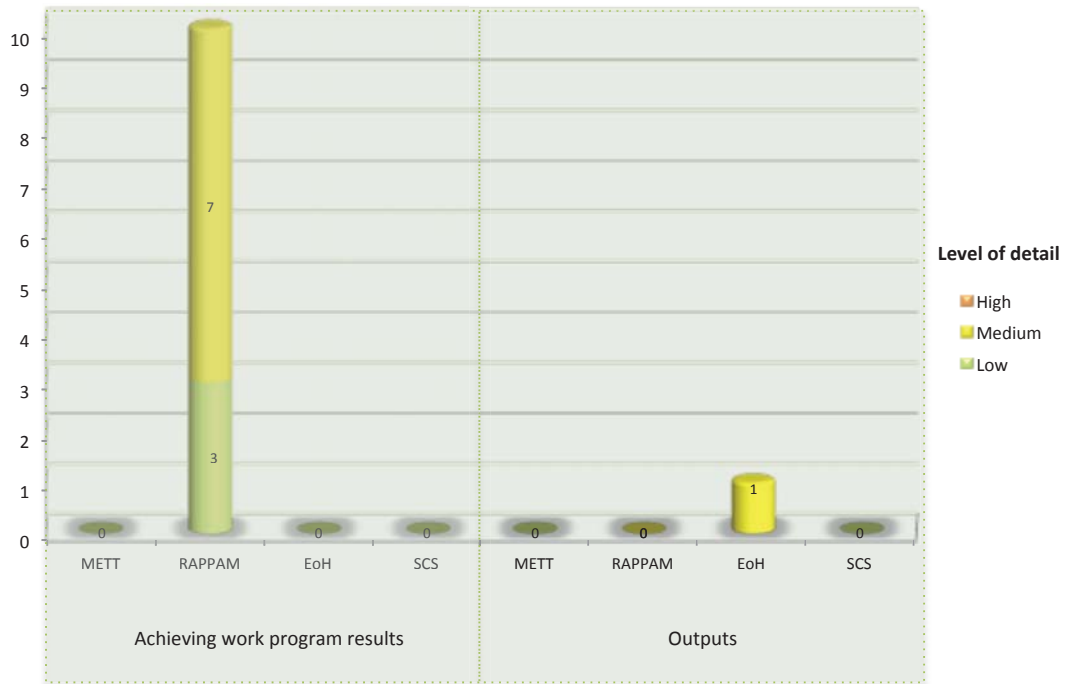


Figure 27: The level of detail of the indicators used by METT, RAPPAM, EoH and SCS to assess the two criteria in the "Outputs" element

All of the indicators used by RAPPAM and EoH in this theme and its two criteria require monitoring to be assessed.

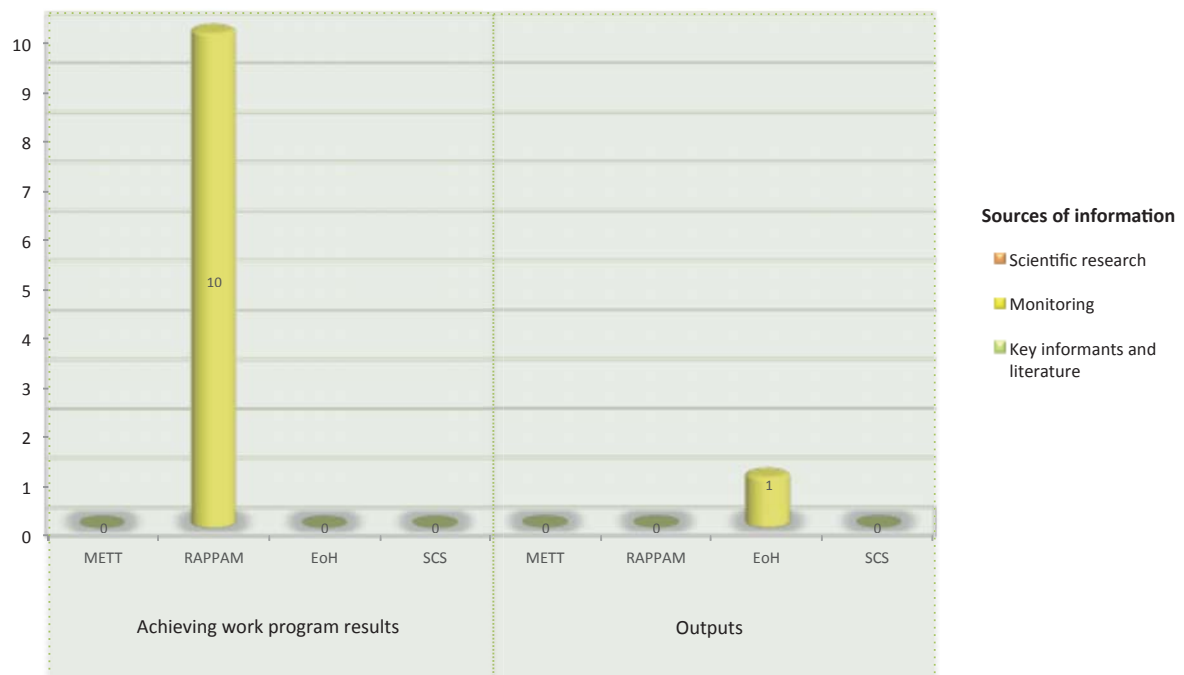


Figure 28: The sources of information required for assessing the indicators used by METT, RAPPAM, EoH and SCS to evaluate the two criteria in the "Outputs" element

The second element in the theme: "delivery of PA objectives" is "outcomes". This element includes four criteria. However, the criteria "achieving objectives" and "trends of defined values" are not evaluated by any of the methodologies. RAPPAM only evaluates the criterion "effects of PA on communities". METT and EoH evaluate the criteria "condition of the defined values" and "effects of PA on communities". As shown in Figure 28, all the methodologies use one indicator to assess the criteria of this element.

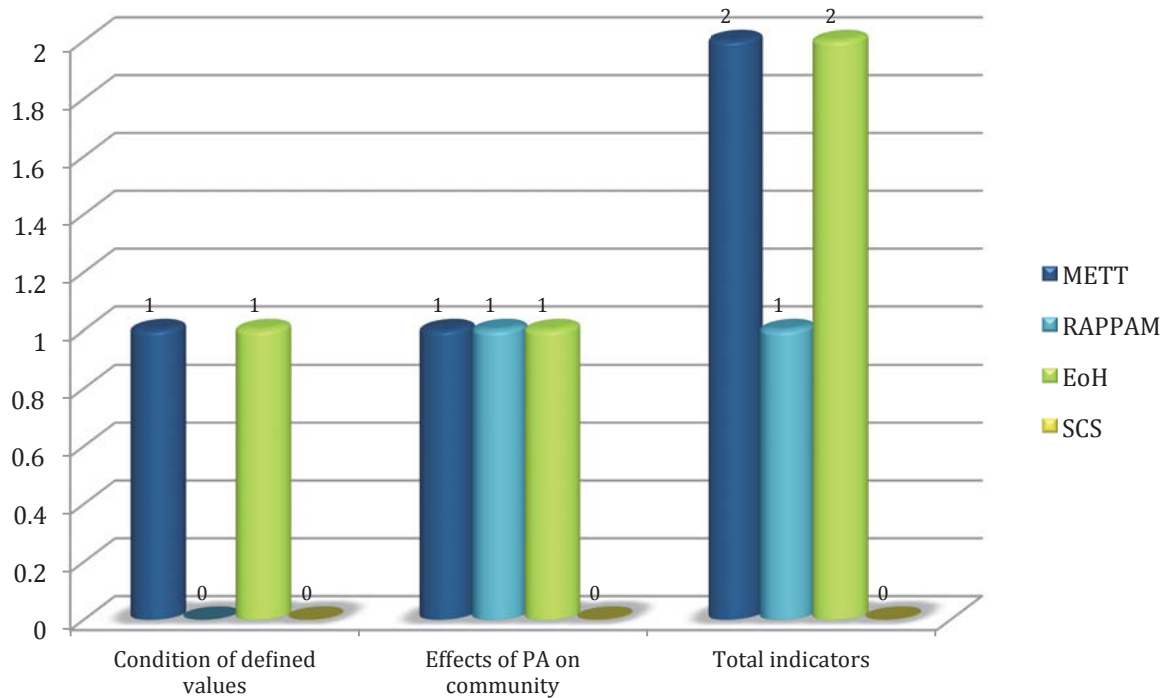


Figure 29: The number of indicators used by METT, RAPPAM, EoH and SCS to assess the two criteria relating to the "Outcomes" element

The analysis of the level of detail of the indicators used to assess the two criteria in the "outcomes" element, showed that all the indicators have a low level of detail, with the exception of one, which has a high level of detail and was used by EoH to assess the "conditions of defined values" criterion.

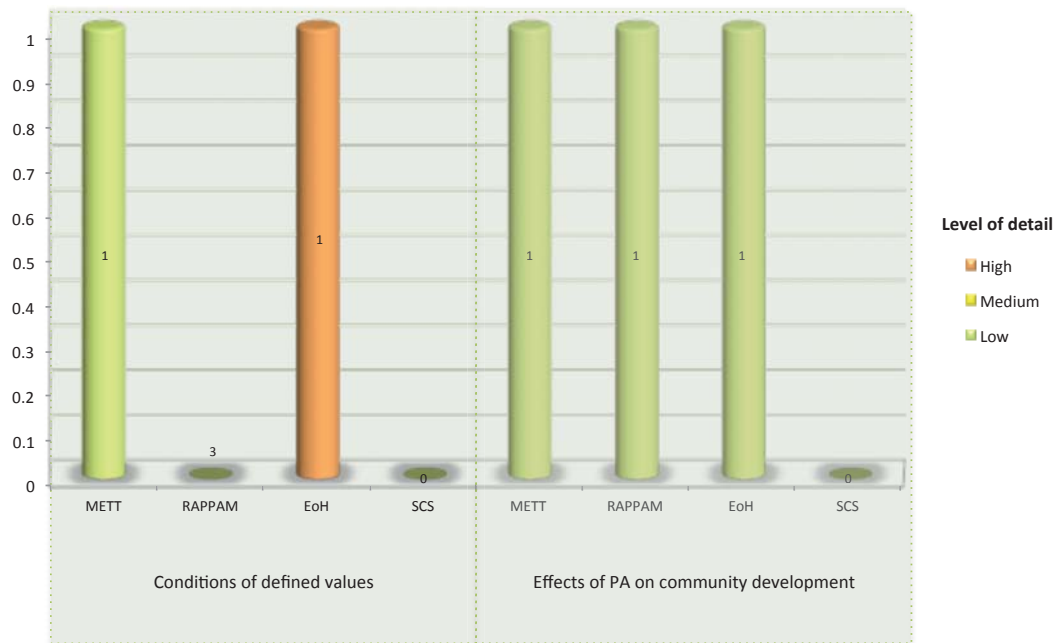


Figure 30: The level of detail of the indicators used by METT, RAPPAM, EoH and SCS to assess the two criteria in the "Outcomes" element

According to the analysis of the sources of information required to assess the indicators shown in Figure 30, all the indicators that evaluate the “conditions of defined values” criterion require monitoring to be assessed. All the indicators that evaluate the “effects of PA on community development” criterion require key informants and literature to be assessed.

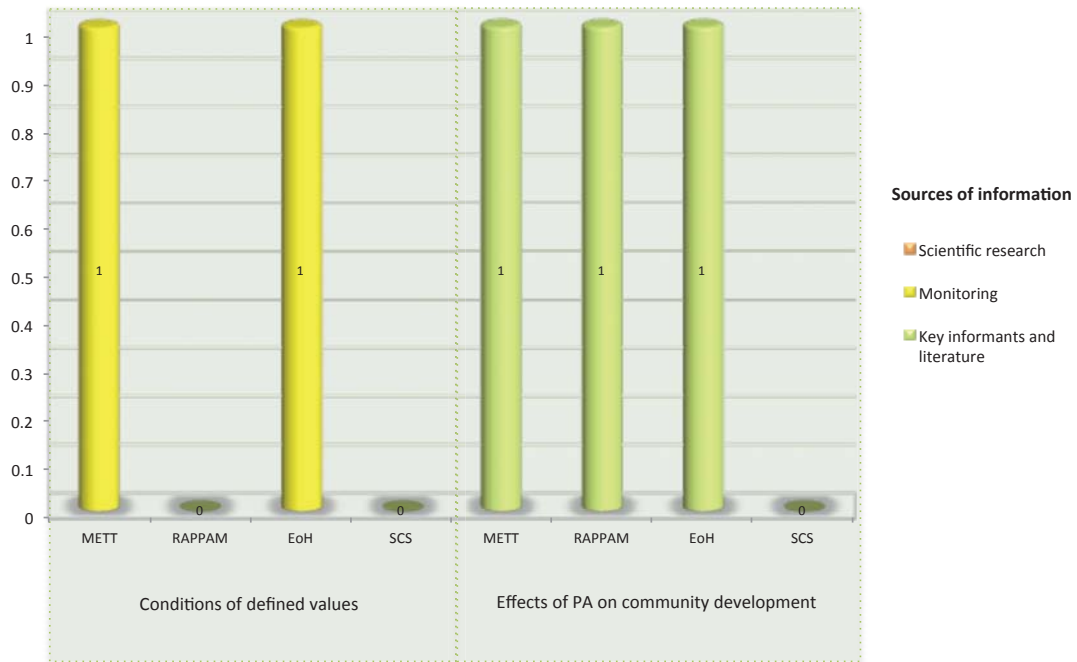


Figure 31: The sources of information required for assessing the indicators used by METT, RAPPAM, EoH and SCS to evaluate the two criteria in the "Outcomes" element

5.4 Summary of results

Table 11 summarises the findings of the analysis. The table lists the 36 criteria all PAMES should assess; the total number of indicators used by each methodology (in the blue column); the total number of indicators in each level of detail; and the number of indicators that require the different sources of information. The criteria highlighted with green are the criteria that all methodologies evaluate. The numbers highlighted with green are the criteria identified as areas of focus for each methodology.

Figure 31 presents a comparison of the percentages of indicators used by each methodology to assess the six elements PAMEs should assess. METT and RAPPAM focus on the evaluation of the context and processes. EoH and SCSC focus on planning and processes. EoH and RAPPAM are the only methodologies that assess the outputs of the PA.

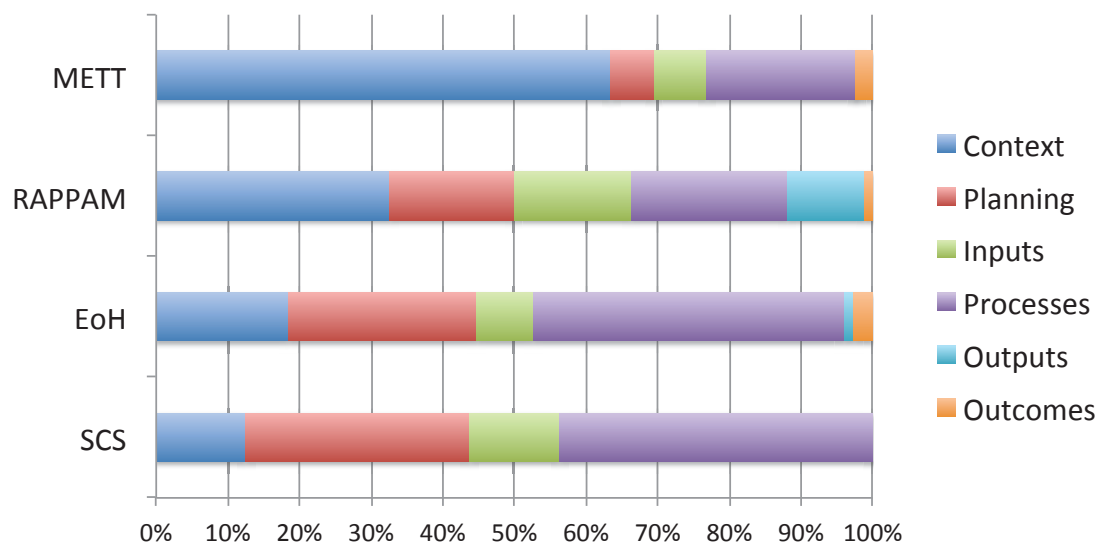


Figure 32: Percentages of indicators used by METT, RAPPAM, EoH and SCS to assess the six elements of the PAMEs suggested by IUCN's framework

Table 12 summarises the findings and allows the comparison of the themes, elements and criteria assessed by the methodologies. The themes, elements and criteria are listed with the numbers they have according to their positions on the list (presented in Figure 3). The table also summarises the levels of detail, types of sources of information and types of approaches used to assess the indicators in each methodology.

	Analysis of categories				Analysis of indicators			
	Themes assessed	Elements assessed	Criteria assessed	Criteria evaluated more thoroughly	Total number of indicators	Level of detail	types of sources of information	Types of approaches for evaluation
METT	1. Design and planning 2. Adequacy and appropriateness of management systems and processes 3. Delivery of PA objectives	1. Context 2. Planning 3. Inputs 4. Processes 6. Outcomes	1. Threats 5. Legal status / gazettal 8. Management planning 9. PA design 11. Staff 12. Funding 13. Equipment and facilities 14. Information 17. Administration, work programming and internal organisation 18. Evaluation 19. Maintenance of infrastructure, facilities and equipment 22. Law enforcement 23. Community involvement 24. Communication, education and interpretation 26. Sustainable resource use, management and audit 27. Visitor management 29. Resource protection and threat reduction 30. Research and monitoring 34. Condition of defined values 36. Effect of protected areas on community	1. Threats 12. Funding 17. Administration, work programming and internal organisation 23. Community involvement	82	Low: 78% Medium: 22% High: 0	Key informants and literature: 52% Monitoring: 18% Scientific research: 10%	Ordinal: 100% Nominal: 0% Mixed: 0%
Totals	3/3	5/6	20/36					
RAPPAM	1. Design and planning 2. Adequacy and appropriateness of management systems and processes 3. Delivery of PA objectives	1. Context 2. Planning 3. Inputs 4. Processes 5. Outputs 6. Outcomes	1. Threats 2. Values and significance 3. Stakeholders attitudes and relations 4. Influence of external environment 5. Legal status / gazettal 6. Tenure issues 8. Management planning 9. PA design 11. Staff 12. Funding 13. Equipment and facilities 14. Information 17. Administration, work programming and internal organisation 18. Evaluation 19. Maintenance of infrastructure, facilities and equipment 20. Staff training 22. Law enforcement 23. Community involvement 27. Visitor management 30. Research and monitoring 31. Achieving work program results 36. Effect of protected areas on community	2. Values and significance 4. Influence of external environment 8. Management planning 31. Achieving work program results	92	Low: 87% Medium: 11% High: 2%	Key informants and literature: 84% Monitoring: 14% Scientific research: 2%	Ordinal: 98% Nominal: 2% Mixed: 0%
Totals	3/3	6/6	22/36					
EoH	1. Design and planning 2. Adequacy and appropriateness of management systems and processes 3. Delivery of PA objectives	1. Context 2. Planning 3. Inputs 4. Processes 5. Outputs 6. Outcomes	1. Threats 2. Values and significance 3. Stakeholders attitudes and relations 4. Influence of external environment 5. Legal status / gazettal 7. Adequacy of legislation 8. Management planning 9. PA design 11. Staff 12. Funding 13. Equipment and facilities 14. Information 17. Administration, work programming and internal organisation 18. Evaluation 19. Maintenance of infrastructure, facilities and equipment 20. Staff training 21. Human resource management 22. Law enforcement 23. Community involvement 24. Communication, education and interpretation 25. Community development assistance 27. Visitor management 29. Resource protection and threat reduction 30. Research and monitoring 32. Outputs 34. Condition of defined values 36. Effect of protected areas on community	4. Influence of external environment 8. Management planning 17. Administration, work programming and internal organisation 23. Community involvement	76	Low: 40% Medium: 51% High: 9%	Key informants and literature: 89% Monitoring: 11% Scientific research: 0%	Ordinal: 57% Nominal: 35% Mixed: 8%
Totals	3/3	6/6	27/36					
SCSC	1. Design and planning 2. Adequacy and appropriateness of management systems and processes	1. Context 2. Planning 3. Inputs 4. Processes	1. Threats 4. Influence of external environment 5. Legal status / gazettal 6. Tenure issues 8. Management planning 9. PA design 11. Staff 13. Equipment and facilities 17. Administration, work programming and internal organisation 20. Staff training 23. Community involvement 24. Communication, education and interpretation 30. Research and monitoring	8. Management planning 17. Administration, work programming and internal organisation 30. Research and monitoring	16	Low: 31% Medium: 69% High: 0%	Key informants and literature: 100% Monitoring: 0% Scientific research: 0%	Ordinal: 100% Nominal: 0% Mixed: 0%
Totals	2/3	4/6	13/36					

5.4.1 General comparisons of level of detail among methodologies

The four methodologies showed different levels of detail in their indicators, as illustrated in Figure 32. RAPPAM has the highest percentage (87%) of indicators with a low level of detail, 11% with a medium level of detail and 2% with a high level of detail. 78% of METT's indicators have a low level of detail and the remaining 22% have a medium level of detail. SCSC has 69% of indicators with a low level of detail and 31% with a medium level of detail. 40% of the indicators used by EoH have a low level of detail, 51% have a medium level of detail and 9% have a high level of detail.

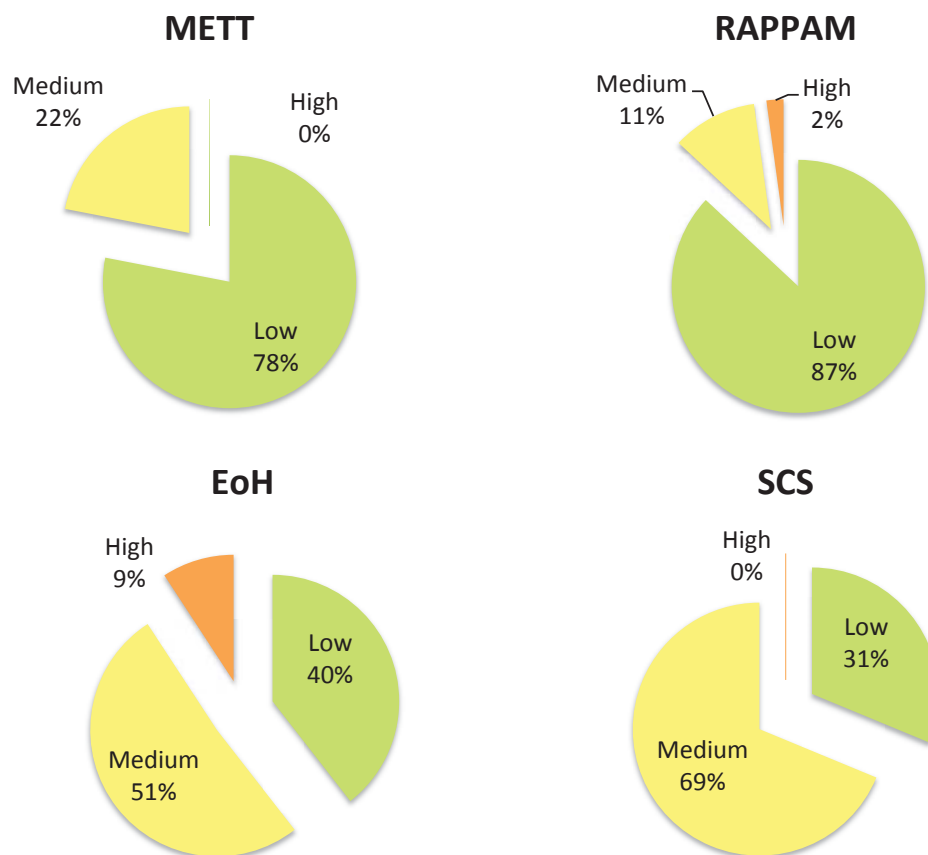


Figure 33: Comparison of percentages of levels of detail in the indicators used by METT, RAPPAM, EoH and SCS

5.4.2 General comparison of sources of information among methodologies

It was found that the majority of the indicators in the four methodologies could be assessed with the input of key informants and literature, as shown in Figure 33. However, SCS was the only methodology that can be conducted exclusively with the information provided key informants and literature. EoH requires monitoring to assess 11% of its indicators. RAPPAM requires monitoring for 14% of its indicators and scientific research for 2% of its indicators. METT requires monitoring for 38% of its indicators and scientific research for 10% of its indicators.

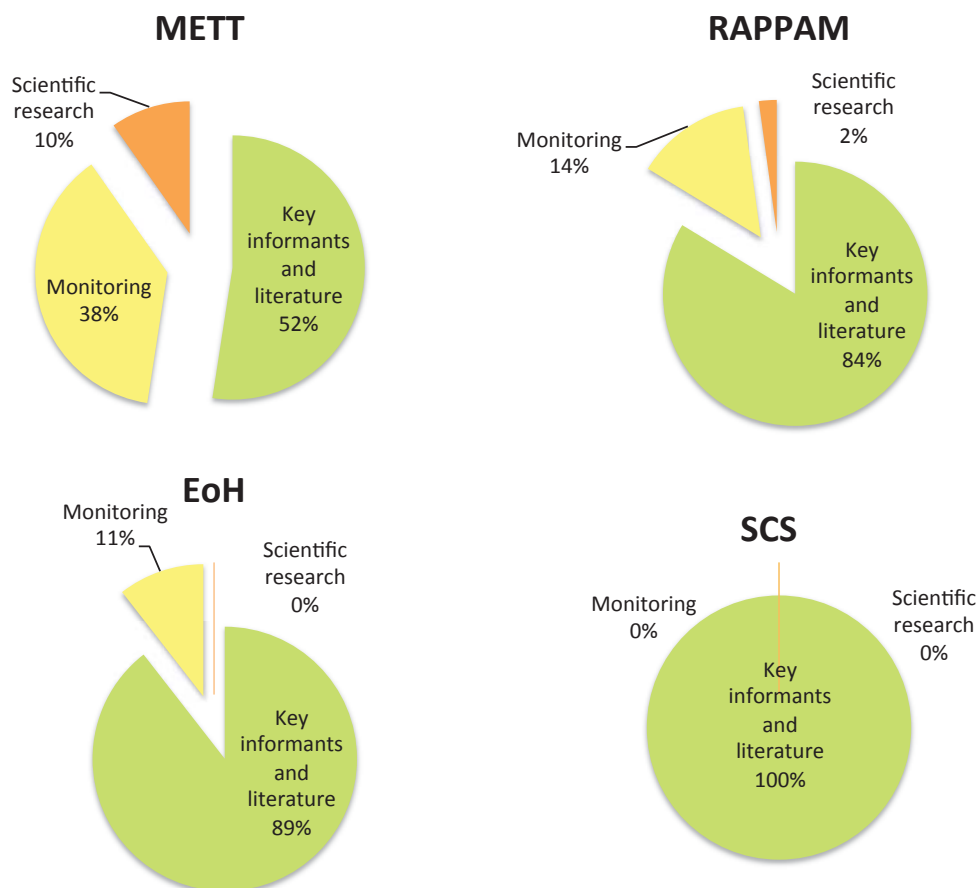


Figure 34: Comparison of percentages of sources of information required to complete the methodologies compared

5.4.3 Comparison of types of approaches used to assess the indicators

The approaches used to evaluate the indicators varied among methodologies. Figure 34 presents the percentages of the types of approaches found in each methodology. METT and SCSC only use indicators that take an ordinal approach. 2% of RAPPAM's indicators are mixed indicators and the rest are ordinal. 57% of EoH's indicators use ordinal approaches, 35% are nominal and 8% mixed.

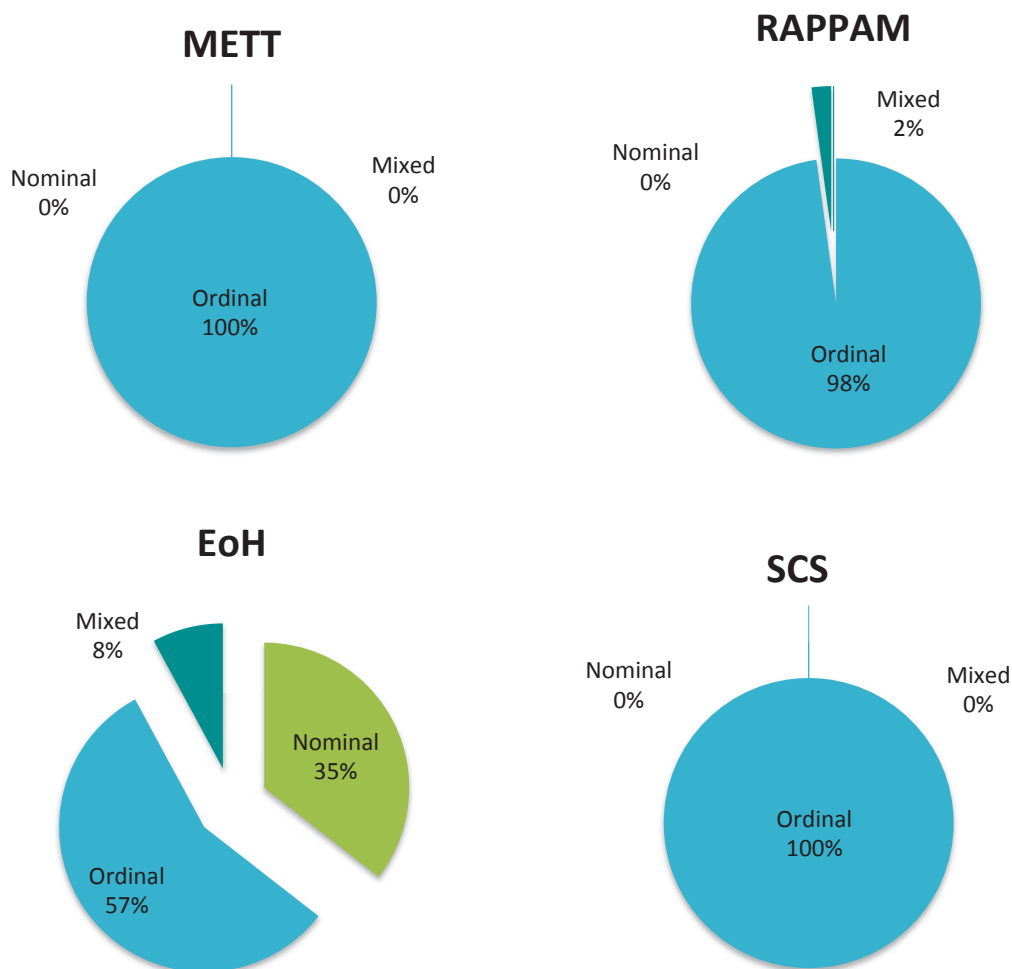


Figure 35: Comparison of percentages of approaches used by the indicators of METT, RAPPAM, EoH and SCS

Chapter 6: Discussion

This research has revealed several similarities and differences between the four methodologies studied. This chapter will discuss the key findings within the context of the wider literature. First the similarities between the four methodologies will be considered, including: the shared criteria evaluated by all four methodologies; their weak evaluation of the third theme “delivery of PA objectives”; their tendency to use ordinal approaches to evaluate indicators, and the lack of aggregated scoring systems. Next the differences in the themes, elements and criteria evaluated; the diverse levels of detail used by the four methodologies and the variety of sources of information required by each methodology will be discussed. The key strengths and weaknesses of each methodology will then be reviewed. Finally, general recommendations for selecting the most appropriate methodology for different situations will be made.

The information generated by this research will be discussed in relation to the existing literature. However, as observed by Stoll-Kleemann (2010) there is relatively little published information about this topic. Thus, limitations were encountered in seeking to find literature with which to compare the findings of this study.

6.1 Similarities among methodologies

6.1.1 Criteria evaluated by all four methodologies

METT, RAPPAM, EoH and SCS all evaluate different combinations of criteria. However, they do assess nine common criteria, namely:

1. Threats
2. Legal status
3. Management planning
4. PA design
5. Staff
6. Equipment and facilities
7. Administration, work programming, and internal organisation
8. Community involvement
9. Research and monitoring

These nine criteria represent 25% of the criteria the literature suggests that PAMEs should evaluate (Hockings *et al.*, 2015; Leverington, Lemos-Costa, Courrau *et al.*, 2010; Hockings *et al.*, 2006). These criteria are essential components for the management of PAs. However, according to Hockings *et al.* (2006 & 2015) effective management requires more, including the analysis of the current situation; the existence and application of appropriate planning; the allocation of necessary inputs; the implementation of the management actions and the generation of outputs and outcomes. Effective management is a complex process and to conduct a thorough evaluation of it, a wide range of criteria should be evaluated (Hockings *et al.*, 2000; Hockings *et al.*, 2006). According to the literature, 36 criteria should be evaluated to generate a comprehensive analysis of the conditions of PAs and their management (Hockings *et al.*, 2015; Leverington, Lemos-Costa, Courrau *et al.*, 2010; Hockings *et al.*, 2006). The four methodologies do evaluate more than the nine shared criteria, but the fact that they only evaluate 25% of the same criteria highlights that they are all evaluating different aspects of management. It should also be noted that none of the methodologies address 100% of the criteria suggested by the literature.

6.1.2 Weak of evaluation of the third theme: “delivery of protected area objectives”

It was found that there are major weaknesses in the evaluation of the third theme “delivery of protected area objectives” in all four methodologies. RAPPAM uses eleven indicators to assess this theme, but this is still relatively few in comparison with the number of indicators used to evaluate the other two themes, and the information generated is not extensive enough to fully evaluate all the possible outputs and outcomes of management actions. METT uses two indicators, EoH uses three and SCS does not evaluate this theme at all.

The weak evaluation of this theme leaves a gap in the results provided by these methodologies. This theme encompasses the results of the implementation of the management programmes and actions, the delivery of products and services, the level of achievement of the PA’s objectives, the level of maintenance of the core values of the PA and the positive effects on the local communities (Hockings *et al.*, 2006; Hockings *et al.*, 2008). These are important aspects of management that should be considered when evaluating management effectiveness.

METT clarifies in its introduction that the results provided by its application are too limited to generate a detailed evaluation of the outcomes (Stolton *et al.*, 2007). EoH also recognises the difficulty of evaluating outcomes. The introduction and explanation of the methodology reflects on the fact that outcomes are considered to be the most difficult element to measure accurately (Hockings *et al.*, 2008). Nonetheless, this should be a critical area of evaluation. RAPPAM states that its evaluation is based on the management cycle, which includes the six elements of the IUCN’s framework (Ervin, 2003). Thus, it

evaluates all six elements. However compared to the rest of the elements, this one is not assessed very thoroughly. SCS focuses on identifying if a PA is functional by the identification of the basic on site protection activities and the existence of long-term management and financing capacity (The Nature Conservancy, 2003). To identify the extent to which these characteristics are being achieved the evaluation of the outcomes and outputs is fundamental. However, these two elements of the theme “delivery of protected are objectives” are not evaluated at all.

If potential users want to obtain more information on the third theme, “delivery of protected are objectives” and its elements “outputs” and “outcomes”, it is recommended that more indicators need to be added to these methodologies or alternative methodologies need to be consulted.

6.1.3 Use of ordinal approaches for the evaluation of the indicators

Three approaches used to assess indicators were identified: ordinal, nominal and mixed. The indicators assessed using these approaches differ in their content, evaluation systems, and levels of inputs required from the participants to conduct the evaluation. Some require the selection of an option and others the elaboration of one. The different approaches demonstrate the many possibilities for assessing indicators.

It was found that all four methodologies tended to use ordinal approaches to assess their indicators. METT and SCS use ordinal approaches for all of their indicators, making the assessment of their indicators relatively easy, by the selection of one out of several options. However, it was found that half of the

indicators employed by SCS seek to assess several characteristics with a single indicator, and that the options provided do not encompass all the possible combinations of characteristics. This situation was only found in SCS, and it suggests that the ordinal approach is not always useful when two or more characteristics are being assessed. The majority (98%) of the indicators in RAPPAM use an ordinal approach. The remaining use a mixed approach. These indicators are used to list and assess the threats and pressures the PAs are facing using a rating scale. EoH is an exception, because it uses all three approaches. However, most of its indicators use an ordinal approach. The indicators in EoH that evaluated several characteristics use a nominal approach. This allows participants to elaborate upon their answer to describe the current situation instead of selecting an option, which generates a score. This approach allows participants to provide qualitative and in some cases quantitative feedback, when referring to percentages or numbers related to the conditions assessed.

These results are consistent with those of Leverington, Lemos-Costa, Courrau *et al.* (2010) who found that most of the methodologies they analysed use an ordinal approach with ratings, providing a final score as feedback. Although it is the most widely used approach, it was found that when an indicator attempts to assess several characteristics a nominal approach can be more useful to capture more comprehensive information. However, rating these answers may be difficult.

6.1.4 Lack of aggregated scoring systems

METT, RAPPAM and SCS use a scoring system to provide a final score to the assessment. In contrast, EoH only uses scoring for some components of its

assessment. The overall scores are based on the individual scores obtained for each indicator according to the answer selected. The only exception to this scoring system was found in METT, which also incorporates a weighted scoring system for three indicators. These indicators obtain an extra point when the condition of management evaluated has more characteristics than the basic ones listed (Stolton *et al.*, 2007). These extra points give more weight to relevant matters. It has been suggested by Anthony & Shestackova (2015) that an aggregated weighted scoring system allows the allocation of more weight (or higher scores) to indicators with higher relevance. The use of weighting systems might help to improve the relevance of the final scores of the assessments by giving more emphasis to crucial aspects of management. The employment of these systems could potentially improve the performance of the evaluation and the meaningfulness of the final scores.

6.2 Differences between the methodologies

6.2.1 Evaluation of different themes, elements and criteria

The four methodologies evaluate different themes, elements and criteria using different numbers of indicators. All the methodologies attempt to evaluate the three themes, with the exception of SCS, which does not evaluate the third theme. RAPPAM and EoH are the only two methodologies that evaluate all six elements suggested by the IUCN's framework. METT evaluates five elements and SCS four. These results differ from the findings of Leverington, Lemos-Costa, Courrau *et al* (2010). This might be due to the subjective allocation of certain indicators to particular criteria and corresponding elements. Nonetheless, the introduction and description of RAPPAM and EoH explicitly express that

these methodologies seek to address the six elements suggested by IUCN's framework and this study concurs. In the case of METT, Leverington, Lemos-Costa, Courrau *et al* (2010) found it does evaluate "outputs", while this study did not allocate any indicator to the "outputs" element. METT indicates two indicators are related to outputs. However, it was found that according to the methodology's explanation, one is also considered to belong in the "planning" element because it measures the existence and implementation of a regular work plan. In this study, this indicator was allocated to the "planning" element due to its capacity to describe the conditions of the plans of the PA. The other indicator that was labelled under the "outputs" element evaluates the existence and adequacy of visitor facilities. This indicator is evaluating the existence of a product or service, which is why it is considered to be an output. But also, it assesses the adequacy of the visitor facilities and there are other categories that refer to that. In the "adequacy and appropriateness of management systems and processes" theme there is a criterion that specifically refers to the "visitor management". Therefore, this study allocated this indicator to this criterion. In the case of SCS, the introduction and explanation of the methodology does not elaborate on the elements assessed. Thus, it is likely that the allocation of the indicators in the different criteria followed different methods and logic.

In relation to the total criteria suggested by the IUCN's framework and other recent publications regarding PAMEs, SCS evaluates 36% of the criteria; METT 55%; RAPPAM 61%; and EoH 75% (Hockings *et al.*, 2015; Leverington, Lemos-Costa, Courrau *et al.*, 2010; Hockings *et al.*, 2006). These results highlight the different focus of the four methodologies. Some methodologies are evaluating certain aspects, whilst others are not. These variations make it difficult to compare the final results provided by each, since a final score given

by one methodology might be ignoring aspects of management considered by another methodology. If a simple methodology, such as SCS is employed the assessment might generate little feedback or a false sense of achievement, because only a few conditions of management are assessed. If a more comprehensive methodology is used, such as EoH, the results might provide better feedback and more specific guidance to improve management. It is recommended that before any methodology is employed it should be carefully assessed to ensure its relevance to the assessment's objectives and to the protected area.

6.2.2 Methodologies showed different levels of detail in their indicators

The analysis of the level of detail investigated how many characteristics are evaluated per indicator. This analysis showed that the four methodologies use different approaches in assessing their indicators. Most indicators in RAPPAM only measure one characteristic. However, the large number of indicators used by this methodology to assess the first and second theme, provide an ample description of the characteristics of the conditions of management assessed. This methodology also incorporates a high level of detail in the indicators used to assess the pressures and threats to the PA.

In the case of METT, 78% of its indicators evaluate one characteristic and the rest between two and three. Thus this methodology had a higher level of detail than RAPPAM, but the number of indicators used to assess management is fewer. This is mainly because 50 of METT's 82 indicators assess threats. In contrast, the rest of methodologies assess threats and pressures with one or two indicators. SCS has the lowest number of indicators with a low level of detail

among the four methodologies. The majority (69%) of its indicators evaluate between two and three characteristics, therefore they provide a medium level of detail. However, as discussed earlier, for half of these indicators the answers provided fail to encompass all the possible answers, limiting their applicability. EoH presented the highest level of detail. The majority (51%) of the indicators evaluated two or three characteristics, obtaining a medium level of detail. 9% of the indicators evaluated more than three characteristics, obtaining a high level of detail. Most of these indicators take a nominal approach for their assessment. The remaining indicators have a low level of detail.

All the methodologies utilise a different level of detail in their indicators. METT and RAPPAM focused on evaluating one characteristic per indicator, which facilitates the provision of options for the answers. SCS and EoH go further with their indicators, they assess more than one characteristic and in some cases do so successfully. However, the use of a nominal approach to assess complex indicators might be a possible solution to the traditional use of ordinal options, which constrain the ability to elaborate on the conditions of the PA.

6.2.3 Variation of sources of information among methodologies

Most PAMEs are self-assessments based on the judgement of managers, experts and stakeholders. This gives rise to questions about reliability. However, the lack of accessible information to assess the conditions of many PAs means evaluations tend to rely on these judgements (Carbutt & Goodman, 2013; Coad *et al.*, 2015; Cook *et al.*, 2014; Hockings, Cook *et al.*, 2009; Stolton *et al.*, 2007). PAMEs offer a method for reporting on the progress towards the achievement of management objectives in PAs when no other information can be collected

(Leverington, Lemos-Costa, Courrau *et al.*, 2010; Coad *et al.*, 2015). Therefore, the methodologies should be relatively accessible. Managers should be able to complete them without needing to spend excessive time and money.

It was found that only SCS can be completed with only the input of key informants (managers, experts and stakeholders) and existing literature. The majority (89%) of EoH can also be completed with these inputs. However, it does require monitoring to assess indicators related to six criteria: “threats”; “stakeholders’ attitudes and relations”; “community involvement”; “visitor management”; “outputs” and “conditions of defined values”. The majority (84%) of RAPPAM can also be completed with the input of key informants and literature. But it requires monitoring to assess three criteria: “threats”, “visitor management” and “achieving work programs”. RAPPAM also requires scientific research to assess two indicators in the “values and significance” criteria, which are related to the assessment of the maintenance of minimum viable populations of key species and the consistency of historical structural diversity of the PA. METT requires the input of key informants and literature to assess 52% of its indicators. METT has the highest number of indicators that require monitoring and scientific research. 38% of its indicators require monitoring, including indicators assessing: “threats”, “legal status”, “visitor management” and “conditions of defined values”. 10% of the indicators require scientific research (all assessing the “threats” criteria). METT has a strong focus on threats and pressures, and considers the possibility of identifying unknown threats, requiring monitoring and research to identify and assess these possible threats.

6.3 Strengths and weaknesses

This section will provide a review of the strengths and weaknesses of each methodology identified by this research. The most comprehensive study into PAME methodologies and their strengths and weaknesses is the overview of approaches by Leverington, Hockings *et al.* (2007). The information gathered by this study builds upon their findings adding further insight into the characteristics of these methodologies to inform future selections.

6.3.1 Strengths and weaknesses of METT

METT is particularly unique because it dedicates more than half of its indicators to the assessment of threats and pressures to PAs. It also poses questions about possible threats to the PA that require monitoring and scientific research to be identified and assessed, providing scope to identify unknown threats. As such, it has the potential to provide a broad list of threats and pressures a PA may face. The downside of the predetermined list is that if a threat is not listed, it might not be identified and assessed. The other weakness of its approach is that the indicators rate threats using “high – medium – low – n/a” options and do not analyse other characteristics, such as: probability; permanence; causes; groups affected; and other variables which could provide a more comprehensive analysis of the threats.

Besides the “threats” criterion, METT focuses on analysing three other criteria: “funding”; “administration, work programming and internal organisation”; and “community involvement”. In total, METT evaluates approximately half of the total number of criteria suggested by the literature, leaving considerable scope for possible improvements. METT is the most widely

used methodology around the world (Coad *et al.*, 2015). However, there are countries such as Brazil, Indonesia, and South Africa that have implemented both METT and RAPPAM in their PAs (Nolte, 2014; Yunia, n.d.; Cowan, 2010; Carbutt & Goodman, 2013). Perhaps the combination of methodologies can provide a better understanding of the conditions of PAs since both assess different aspects of management. Evidence of this is provided by the METT-RAPPAM crossover identified by the global study on PAMEs. No literature was found about this crossover, but according to the global study on PAMEs this combination of methodologies has been applied in Latin America (Leverington, Lemos-Costa, Courrau *et al.*, 2010).

METT has 82 indicators, of which the majority (78%) focus on the assessment of one characteristic, making them relatively easy to assess. The predetermined answers allow participants to select the most appropriate response, which is listed in a four options rating system from lowest to highest. This ordinal approach generates scores that inform a final score, which can be useful for future comparisons. However, some argue that the scores can be misleading and that they may not accurately reflect the levels of achievements in PAs (Anthony & Shestackova 2015; Nolte, 2014; Carbutt & Goodman, 2013). However, METT was the only methodology among the four studied that incorporates a weighted scoring system to give more weight to certain aspects of management.

The exhaustive search of threats and pressures proposed by METT, requires users to conduct some research and monitoring as the most appropriate means for their identification and assessment. Although in some cases the indicators that require more inputs may not be applicable. Additionally, METT

requires monitoring to assess indicators related to the: “legal status”, “visitor management” and “conditions of defined values” criteria. The use of additional inputs to assess these matters should be considered by the potential users. In some cases this information may be already available, and if it is up-to-date, it will not be necessary to conduct additional research and monitoring.

6.3.2 Strengths and weaknesses of RAPPAM

One of the main advantages of RAPPAM is the large number of indicators it assesses. Even though most of them only assess one characteristic of the condition of management evaluated, together they provide a broad description of the situation of the PA. In particular, this methodology will be able to generate a detailed description of four criteria: “values and significance”, “influence of external environment”, “management planning” and “achieving work programs”. The latter is a criterion within the theme “delivery of protected area objectives”. This theme also has five more criteria, from which four are not evaluated at all, and one is evaluated with one indicator. Thus, this theme has a lack of information. Due to the detailed description of the criterion “achieving work programs”, this methodology has the most indicators to assess this theme among the four methodologies assessed. But as a result of the lack of assessment of the other criteria the information generated by this theme is not abundant. Therefore this is an area where improvements could be made to enhance the results generated. As mentioned earlier, RAPPAM evaluates 61% of the criteria suggested by the literature (Hockings *et al.*, 2015; Leverington, Lemos-Costa, Courrau *et al.*, 2010; Hockings *et al.*, 2006), second only to EoH. This highlights that there are several elements of management, which are not being evaluated by the methodology.

Another strength of this methodology is that the majority of indicators (84%) can be assessed with the input of key informants and literature. However, monitoring may be required for the assessment of 13 indicators and scientific research for the assessment of two indicators. Most of the indicators used in this methodology are evaluated using an ordinal scale that offers four options: yes – mostly yes – mostly no – no. This characteristic facilitates the assessment. Most of the indicators only assess one characteristic, making the indicators straightforward. The only exception to this ordinal approach is found in the assessment of threats and pressures. In this case, the indicators have two parts a nominal component, where the threats and pressures are listed and an ordinal component where they are evaluated using five ordinal scales, which measure: existence; probability; extent; impact and permanence. All of the answers in this methodology obtain a score that is later used to generate an overall score for the assessment. Despite the critics of the scoring systems mentioned earlier, the benefit that RAPPAM provides is that the score generated by it, may be compared with scores for other PAs with similar conditions, that have also been assessed using RAPPAM. A method for such comparisons is explained in the description of the methodology, which also explains exhaustively all the aspects of the methodology to ensure the users apply it adequately.

RAPPAM is the second most widely used methodology around the world. It has been applied approximately half as often as METT, and in approximately half of the countries where METT has been used (Coad *et al.*, 2015). RAPPAM is a very popular methodology that has had wide acceptance among users from different countries and contexts (Kurdoglu & Avcioglu Cokcaliskan, 2011; Porej *et al.*, 2009; Ervin, 2003b). However some users have reported that they have

faced a scarcity of information to assess all the indicators and complete the methodology (Kurdoglu & Avcioglu Cokcaliskan, 2011). Therefore, it is recommended that users should understand what the methodology requires before the assessment is initiated, to ensure all the information needed will be available.

6.3.3 Strengths and weaknesses of EoH

EoH uses several approaches to characterising and scoring indicators. This delivers a completely different method for assessing the management effectiveness of PAs to the other three methodologies. The use of ordinal, nominal and mixed approaches to assess its indicators provides the opportunity to expand on the analysis of the conditions assessed. The lack of scoring systems for certain parts of the evaluation allows participants to generate specific answers with both qualitative and quantitative information, which deliver additional perspectives to the assessment. As Hockings (2003) suggests, a balance between qualitative and quantitative information can be more useful, and that is what EoH uses for providing in depth analysis. Some of its indicators ask for percentages; sizes of areas; numbers of staff; and other quantitative information, which is also combined with qualitative information to provide a broad perspective to the analysis and contribute to facilitating comparisons over time. EoH was the only methodology among the four analysed that employed the use of qualitative and quantitative information in its evaluation.

Although EoH has 17 fewer indicators than RAPPAM, it is able to provide more information, since more than half (51%) of its indicators assess between two or three characteristics. Many of these indicators use a nominal approach, which

allows participants to elaborate upon their answers, instead of merely selecting one from a predetermined list. EoH provides the highest level of detail among the four methodologies evaluated, but still mainly only requires key informants and literature to assess its indicators, making it accessible for potential users. However, it does require monitoring to assess indicators for six criteria. This is mainly because it seeks to assess the current situation to compare it with previous and future assessments.

According to the analysis conducted, this methodology is able to provide more information on the “influence of external environment”; “management planning”; “administration, work programming and internal organisation”; and “community involvement” criteria. This methodology takes a particular interest in the relationship of the PA with its neighbours and stakeholders. Thus it can be useful for PAs that wish to analyse their links and levels of involvement with local communities and partners.

Of the four methodologies evaluated, EoH assesses the highest percentage of criteria (75%) suggested by the literature (Hockings *et al.*, 2015; Leverington, Lemos-Costa, Courrau *et al.*, 2010; Hockings *et al.*, 2006). Therefore, it may be able to provide a more holistic analysis than the other three methodologies. However, it does have some limitations. The use of a nominal approach that does not provide a set of answers can generate debate among the different groups of participants, requiring more time for an agreement on a final answer. However, the literature suggests the methodology has been able to provide an objective way to find the strengths and weaknesses of the management of PAs (Seychelles Island Foundation, 2007). Applying this methodology does not require large sums of money, but it does require time and human resources (Novo Torres &

Díaz Martín, 2007; Seychelles Island Foundation, 2007). Others have expressed that the design of the assessment promotes a flexible implementation, which allows a participatory assessment that unifies the vision of the stakeholders (Novo Torres & Díaz Martín, 2007). Users have found that the design also encourages follow-ups (Novo Torres & Díaz Martín, 2007; Seychelles Island Foundation, 2007). EoH is the most complete methodology among the four compared in terms of the number of criteria analysed, the type of indicators used, their evaluation approaches, and their level of detail.

6.3.4 Strengths and weaknesses of SCS

SCS is the only methodology among the four analysed that can be completed using only the input of key informants and literature. It also has the fewest indicators of the four methodologies. These characteristics make it accessible for PAs with limited time, human and economic resources. However, the small number of indicators limits the collection of information. This methodology only analyses 36% of the total criteria the literature suggests that PAMEs should address, leaving significant gaps in the assessment (Hockings *et al.*, 2015; Leverington, Lemos-Costa, Courrau *et al.*, 2010; Hockings *et al.*, 2006). It is important to consider that this methodology was created to evaluate parks in peril, thus it aims to identify if the basic managerial structures exist or are being developed (Balloffet & Martin, 2007). Only three criteria are thoroughly assessed: “management planning”; “administration, work programming and internal organisation” and “research and monitoring”.

The major weakness found in SCS was that the majority (59%) of its indicators try to evaluate between two and three characteristics, and the options

of answers provided for half of them do not encompass all the possible combinations of characteristics. Therefore possible answers are left out leaving the assessment incomplete. All of the indicators in this methodology use an ordinal approach in which five options of answers are provided. Based on the answers selected an individual score is allocated, which later informs an overall score for the assessment. If an answer is not available among the options provided, the participants must generate an answer and the scoring of this answer may be unfeasible.

The updated version developed and applied in Europe in 2007 tried to improve several aspects of this methodology, which was originally created in Latin America in 1999. This new version improved the explanations of concepts and indicators; it split certain indicators to avoid assessing several characteristics with a single indicator and it added three additional indicators (Pfleger, 2007). The update was able to address some weaknesses. However, in particular cases the answers provided by the indicators still have gaps. For instance, the indicator that evaluates the monitoring plan tries to evaluate both its development and implementation. The answers provided do not consider the possible existence of a plan, which is not being implemented, or a plan that is out of date. The combination of these two characteristics allows more than five combinations of possible answers therefore the options provided are not sufficient. Further improvements could be made to enhance the results of this methodology. In the meantime, SCS can be a viable option for potential users who want to evaluate PAs that are developing their managerial structures, or to evaluate PA with scarce resources where monitoring or scientific research is limited.

6.4 General recommendations for selecting PAME methodologies

All evaluations differ, they may have different needs, aims and circumstances; the purposes and audiences may be different; the scope and frequency can change from PA to PA; and the types and capacities of agencies and people involved can vary (Hockings *et al.*, 2006). As such, recommending a specific PAME methodology is not possible. However, understanding the characteristics of the methodologies and what they are good for can help guide the selection processes.

This analysis showed all methodologies have strengths and weaknesses. Thus, potential users should select a methodology based on the objectives of the evaluation, the fundamental characteristics of the methodologies, and their potential to inform on crucial matters. To identify the applicability of any methodology, Leverington, Hockings, Pavese *et al.* (2008) proposed a checklist for selecting good evaluation methodologies. This checklist provides eight principles for selecting and adapting methodologies, which consider characteristics such as logic, structure, clarity, expected participation, and content of the methodologies. This checklist can be useful when selecting methodologies, but additional factors might be considered. The characteristics evaluated by this analysis, including the types of sources information required to complete the methodologies; the characteristics of the indicators; and the areas of focus that are evaluated more thoroughly can be used as additional factors to consider in selecting the most suitable methodology for a specific PA. This is further explained in Table 13.

Table 13: Summary of principles for selecting or adapting PAME methodologies and additional factors suggested by this research

Source: Leverington, Hockings, Pavese *et al.*, 2008, p. 6 - 10.

Checklist of principles for good evaluation methodologies proposed by Leverington, Hockings, Pavese et al. (2008)	
Principle	Explanation
1. "The methodology is useful and relevant in improving PA management, yielding explanations and showing patterns, and improving communication, relationships and awareness".	It seeks to identify if the methodology can be used to: improve management, assist in effective resource allocation; promote accountability; involvement of stakeholders; and understanding the level of achievement of goals. It also addresses the relevance of the questions to the PA, and the assessment's capacity to show progress, patterns and trends over time.
2. "The methodology is logical and systematic: working in a logical and accepted framework with balanced approach".	It confirms the methodology is based on a systematic framework, that the six elements suggested by IUCN's framework are included; that a balance exists among themes or dimensions of management; the existence of a hierarchical nested structure, that assumptions are specified and that the design provides a consistent, logic and weighted scoring system, which is explained.
3. The methodology is based on good indicators, which are holistic, balanced, and useful".	It identifies if the indicators are: relevant and appropriate; able to explain or link causes and effects; measurable; precise; consistent; and sensitive.
4. "The methodology is accurate: providing true, objective; consistent and up-to-date information".	It ensures the methodology is structured and explained to yield accurate results, which can be replicable; that the techniques for its implementation are clarified; that the data collection techniques are well-recognised, including the triangulation of data; that a record of data sources is kept; that cultural issues are considered; and that the evaluation can be done quickly to provide up-to-date information.
5. "The methodology is practical to implement, giving a good balance between measuring, reporting and managing".	It confirms the possibilities of implementing the methodology with a reasonable allocation of resources; that it allows the use of existing information; that the steps of the process are clear; its language is comprehensible and non-offensive for all the participants; its design promotes positive discussion; tools of data entry, analysis and reporting are simple; and that it allows a level of cooperation with other evaluation exercises.
6. "The methodology is part of an effective management cycle: linked to defined values, objectives and policies".	It identifies the possibilities of repetition of the methodology; its capacity to be part of a business cycle and other managerial programmes; its ability to assess the levels of implementation of goals, values and objectives and the possibility that its results will be accepted by senior executives.
7. "The methodology is cooperative: with good communication, teamwork and participation of PA managers and stakeholders throughout all stages of the project wherever possible".	It seeks to identify if different points of view are included; if the methodology encourages good cooperation between stakeholders; that an adequate number of staff and community is included; and that the implementation process will improve trust, relationships and cooperation among participants.
8. "The methodology promotes positive and timely communication and use of results. Short term benefits of the evaluation should be demonstrated clearly wherever possible".	It ensures the methodology explains how results should be communicated and used; that the reports generated are clear and specific to improve managerial and conservation practices; that its benefits can be visible in short term; that the feedback can be provided quickly and that the results will influence future plans and actions.
Additional factors highlighted by this research	
Factor	Explanation
The methodology evaluates more thoroughly certain aspects of management.	It ensures the aspects of management evaluated more thoroughly by the methodologies are identified by the users to guarantee they are compatible with the objectives of their assessment. This factor could be integrated in the second principle suggested by Leverington, Hockings, Pavese <i>et al.</i> (2008).
The indicators of the methodology have useful characteristics to facilitate the analysis.	The indicators have useful characteristics that facilitate the assessment, such as: the use of ordinal, nominal or mixed approaches when appropriate; and an adequate method to assess indicators that evaluate one or multiple characteristics. This factor could be integrated in the third principle suggested by Leverington, Hockings, Pavese <i>et al.</i> (2008).
The methodology requires particular sources of information that are accessible to the PA and their staff.	It seeks to identify what sources of information are required to complete the methodology and if the potential users have access to them. This factor could be included in the fifth principle suggested by Leverington, Hockings, Pavese <i>et al.</i> (2008).

Chapter 7: Conclusion

The number and extent of protected areas (PAs) around the world has been growing in recent decades (Deguignet *et al.*, 2014). PAs are not homogenous, they are created for different reasons and exist in different contexts, facing different challenges (Dudley, 2008; Lopoukhine *et al.*, 2012). Protected area management effectiveness evaluations (PAMEs) generate information on the strengths and weaknesses of protected area management to contribute to its continued improvement (Hockings *et al.*, 2006; Ervin, 2003b). When PAMEs are properly applied, they promote a cycle of “action-reflection-action”, which enables ongoing improvement (Berkes, 2010; Reed & Egunyu, 2012). PAMEs have such a significant role that the Convention on Biological Diversity (CBD), the most significant international convention regarding PAs, has made the application of PAMEs a priority. However, the CBD does not specify which methodology to apply, leaving this decision to individual agencies (Secretariat of the Convention on Biological Diversity, 2004). In 2000, the IUCN developed a framework to guide the creation of PAME methodologies, which has informed the development of several methodologies. By 2015, more than 90 PAME methodologies had been published and applied around the world (Coad *et al.*, 2015). But even though most of these were created following the recommendations of the IUCN’s framework, they all vary significantly.

Studies have been published which explain the characteristics of the most commonly used methodologies, including an overview of methodologies provided by a global study on PAMEs (Leverington, Hockings *et al.*, 2007). However, few detailed comparisons of multiple PAMEs have been conducted.

To provide insight into the similarities and differences between methodologies, this study used content analysis to compare four of the most commonly used methodologies. Content analysis enabled an in depth comparison of the indicators used by the methodologies. The indicators were categorised into the corresponding criteria, elements and themes suggested by the IUCN's framework. The aim was to identify the fundamental characteristics of each methodology and explore similarities and differences between the four methodologies. The specific characteristics of the indicators were also explored to assess their viability. The intention of the research was to inform potential users about the different approaches these methodologies use to help them make informed selections.

The main findings of the research relate to the similarities and differences found between the four methodologies. It was found that the methodologies only share a low percentage of their criteria; they all have a weak analysis of the third theme "delivery of protected area objectives"; they mostly use ordinal approaches to assess their indicators; and they lack comprehensive aggregated scoring systems. The majority of these similarities are shortcomings that provide scope for improvements in future revisions of these methodologies or in informing new ones. The major differences found were that the four methodologies evaluate different themes, elements and criteria. Therefore, they assess management effectiveness in different ways generating different types of information regarding protected area management. They all use different levels of detail in their indicators and they require different sources of information to be completed. These results add new information to existing knowledge on the similarities and differences between methodologies. Some of the findings of this research had already been confirmed by the publication by Leverington,

Hockings *et al* (2007), however new information was generated on the specific characteristics and differences among the methodologies.

The results of the study demonstrate that the four methodologies analysed utilise different approaches for evaluating management effectiveness, thus generating different types of results and feedback. As explained in Chapter 6, they all focus on evaluating different areas more thoroughly; they use different numbers and types of indicators to assess certain matters; and apply different methods to generate overall scores for the assessments. As such, directly comparing results between methodologies is not recommended. The common reporting format developed by the global study on PAMEs does enable cross-analysis between methodologies (Leverington, Lemos-Costa, Courrau *et al.*, 2010). However, as demonstrated by this analysis, the methodologies evaluate such different topics that gaps will always exist in comparisons between assessments that use different methodologies.

The four methodologies compared each have different strengths and weaknesses, as summarised in Table 14. All four methodologies provide useful approaches for the assessment of management effectiveness, but also have areas that could be further strengthened. The selection of which to use should be made on the basis of the context of the evaluation. Potential users should be aware of the fundamental characteristics of the methodologies before they choose which one to implement. Substantial information on the key characteristics of PAME methodologies should be available for potential users to reduce the use of inadequate methodologies, which may generate unhelpful feedback and potentially discourage future applications.

Table 14: Summary of strengths and weaknesses of the four methodologies analysed

	Strengths	Weaknesses	More useful when:
METT	<ul style="list-style-type: none"> Strong analysis of threats and pressures to the PAs using 50 indicators. Most widely used methodology worldwide. Most of its indicators (78%) focus on evaluating one characteristic facilitating the assessment. It uses an ordinal approach which provides four options of answers, which inform a final score. It incorporates a minor weighted scoring system. 	<ul style="list-style-type: none"> It assesses 55% of the criteria suggested by literature. There is a risk that users may overlook threats and pressures if they are not included in the predetermined list. Indicators rate threats using “high – medium – low – n/a” options and do not analyse other characteristics, such as: probability; permanence; causes; groups affected; and other variables. Weak assessment of the third theme “delivery of protected area objectives”. 	<ul style="list-style-type: none"> The identification of threats and pressures is a concern. The PA has the capacity to monitor threats, legal status of the PA, visitor management and the conditions of the defined values. Also it should be able to conduct research to identify and assess particular threats and pressures. There is a preference of the use of indicators that require the selection of a predetermined answer instead of the creation of one. The assessment is interested in finding more information on the threats; administration, work programming and internal organisation; and community involvement.
RAPPAM	<ul style="list-style-type: none"> Its large number of indicators allow a broad assessment of the first two themes. Most of the indicators (87%) assess one characteristic facilitating the assessment process. Its scoring method uses an ordinal scale with four options: yes-mostly yes-mostly no- no, facilitating the assessment. The options represent an individual score, which is used to generate an overall score. The indicators that evaluate threats and pressures use a mixed approach, which also assesses their: existence; probability; extent; impact and permanence. The majority of its indicators (84%) can be assessed with the input of key informants and literature. The results of the methodology can be used for comparisons between PAs with similar characteristics. 	<ul style="list-style-type: none"> It assesses only 61% of the criteria suggested by the literature. Weak assessment of the third theme “delivery of protected area objectives” in comparison with its assessment of the other two themes. 	<ul style="list-style-type: none"> The assessment seeks to generate a broad description of the situation of the PA. The assessment is interested in more detailed information on the: values and significance; influence of external environment; management planning; and achievement of work programs. The PA has the capacity to conduct monitoring of the threats, visitor management and the achievement of work programs. Additionally, the PA should be able to conduct scientific research to assess two indicators related to the maintenance of the minimum viable populations of key species and the consistency of historical structural diversity of the PA. There is a preference of the use of indicators that require the selection of a predetermined answer instead of the creation of one.
EOH	<ul style="list-style-type: none"> It uses ordinal, nominal and mixed approaches to assess its indicators providing the opportunity to use the advantages of the three approaches. It allows participants to generate specific answers with qualitative and quantitative information, which deliver additional perspectives to the assessment. Although it has 17 indicators fewer than RAPPAM, its indicators evaluate two, three or more characteristics providing a deeper analysis. Promotes the follow-up and comparisons between current and previous assessments. Regardless that it does not generate scores, it compares changes in the answers. The majority of its indicators (89%) can be assessed with the input of key informants and literature. I has a particular interest in the relationship of the PA with its neighbours and stakeholders. It assesses the highest percentage of criteria (75%) suggested by the literature, in comparison with the other methodologies. It is the most complete methodology among the four compared in terms of the amount of criteria analysed, the type of indicators used, their evaluation approaches, and their level of detail. 	<ul style="list-style-type: none"> Since it does not provide answers in some indicators, the agreement of one among the different stakeholders can be time consuming. Weak assessment of the third theme “delivery of protected area objectives”. But, in comparison with the rest of methodologies this one provides the best approach to assess it. It does not provide a score for all of its sections, therefore it does not have an overall score, which could be used for a holistic analysis or comparisons. This makes it different from the majority of methodologies. Nonetheless, this may be seen as an alternative approach not as a weakness. 	<ul style="list-style-type: none"> The assessment is interested in finding more information on the: influence of external environment; management planning; administration, work programming and internal organisation; and community involvement. The assessment seeks to find out more on the relationship between the PA, the local communities and other stakeholders. There is a preference of the use of different types of indicators, allowing the creation and selection of answers. Time is not a limitation. The PA has the capacity to monitor conditions related to: threats; stakeholders’ attitudes; and relations; community involvement; visitor management; outputs; and conditions of defined values.
SCS	<ul style="list-style-type: none"> 100% of its indicators can be assessed only with the the input of key informants and literature. The few amount of indicators makes it relatively simple to complete. It uses a nominal scoring system that provides five options of answers. This answers have scores, which inform an overall score for the assessment. 	<ul style="list-style-type: none"> The options of answers provided by some indicators do not cover all the possible combinations of characteristics they try to assess. Thus, caution is required when selecting answers and allocating scores. It only analyses 36% of the total criteria the literature suggests that PAMEs should address, leaving significant gaps in the assessment. Weak assessment of the third theme “delivery of protected area objectives”. 	<ul style="list-style-type: none"> Time, human and economic resources are a limitation, and a relatively fast assessment is required to identify the existence basic aspects of management. PA do not have the capacity to monitor or conduct scientific research of any kind. The assessment tries to identify the level of existence of basic matters related to: management planning; administration, work programming and internal organisation; and research and monitoring needs.

This research has shown that there are several characteristics that should be considered when selecting a PAME methodology to ensure it will generate the best possible result. This analysis only compared the themes, elements and criteria evaluated by the methodologies; level of detail of their indicators; the sources of information required to assess them, and the approaches used to assess the indicators. Further analysis could be undertaken to evaluate other characteristics of the methodologies and their components, such as the type of data generated (qualitative or quantitative); the weights used in the scoring systems; the differences among the available frameworks to create PAMEs and their influence in the approaches for assessing management effectiveness, and other factors which make the PAMEs different and perhaps more or less applicable. Content analysis provided a useful research method in facilitating this research and the matrix developed (Annex 2) for analysing alternate PAMEs could be employed in future comparisons. The results of this research demonstrate that there is scope for the most commonly applied PAME methodologies to be improved further. More research is needed to facilitate this ongoing improvement and ensure that PAMEs reach their full potential in informing more effective protected area management.

References

- Anthony, B. P., Shestackova, E. (2015). Do global indicators of protected area management effectiveness make sense? A case study from Siberia. *Environmental Management*, 56 (2015), 176-192.
- Balloffet, N. M., & Martin, A. S. (2007). *Parks in peril site consolidation: a framework for strengthening protected areas*. Arlington, VA: The Nature Conservancy.
- Barber, C. V., Miller, K, R., Boones, M. (Eds.). (2004). *Securing protected areas in the face of global change: issues and strategies*. Gland Switzerland: IUCN.
- Berkes, F. (2010). Devolution of environment and resources governance: trends and future. *Environmental Conservation*, 37 (4), 489-500.
- Brandon, K., Redford, K. H., Sanderson, S. E. (1998). *Parks in peril: people, politics and protected areas*. Washington, DC: Island Press.
- Boitani, L., Cowling, R. M., Dubling, H. T., Mace, G. M., Parrish, J., Possingham, H. P., Pressey, R. L., Rondinini, C., Wilson, K. A. (2008). Change the IUCN protected area categories to reflect biodiversity outcomes. *PLoS Biology*, 6 (3), 436-438.
- Carbutt, C., & Goodman, P. S. (2013). How objective are protected area management effectiveness assessments? A case study from the iSimangaliso Wetland Park. *Koedoe*, 55 (1), 1-8.

Chape, S., Harrison, J., Spalding, M., Lysenko, I. (2005). Measuring the extent and effectiveness of protected areas as an indicator for meeting global biodiversity targets. *Philosophical transactions of the Royal Society*, 360 (2005), 443-455.

Cifuentes, M., Izurieta, A., de Faira, H. H. (2000). *Measuring protected area management effectiveness*. Turrialba, Costa Rica: WWF Centroamérica.

Coad, L., Leverington, F., Burgess, N. D., Cuadros, I. C., Geldmann, J., Marthews, T. R., Mee, J., Nolte, C., Stoll-Kleemann, S., Vansteelant, N., Zamora, C., Zimsky, M., Hockings, M. (2013). Progress towards the CBD protected area management effectiveness targets. *Parks*, 19.1 (2013), N. pag.

Coad, L., Leverington, F., Knights, K., Geldmann, J., Eassom, A., Kapos, V., Kingston, N., de Lima, M., Zamora, C., Cuadros, I., Nolte, C., Burgess, N. D., Hockings, M. (2015). Measuring impact of protected area management interventions: current and future use of the Global Database of protected area management effectiveness. *Philosophical Transactions of the Royal Society B*, 370 (1671), N. pag.

Convention on Biological Diversity. (2010). *COP10 Decision X/31: protected areas*. Retrieved from: <https://www.cbd.int/decision/cop/default.shtml?id=12297>

Convention on Biological Diversity. (n.d.). *List of Parties*. Retrieved from <https://www.cbd.int/information/parties.shtml#tab=0>

Convention on Biological Diversity. (n.d.b). *Aichi biodiversity targets*. Retrieved from <https://www.cbd.int/sp/targets/>

Cook, C. N., Carter, R. W. B., Hockings, M. (2014). Measuring the accuracy of management effectiveness evaluations of protected areas. *Journal of environmental management*, 139 (2014) 164-171.

Cook, C. N., Wardell-Johnson, G., Carter, R. W., Hockings, M. (2014). How accurate is the local ecological knowledge of protected area practitioners?. *Ecology & Society*, 19 (2), 32-40.

Costanza, R., de Groot, R., Sutton, P., van der Ploeg, S., Anderson, S. J., Kubiszewski, I., Farber, S., Turner, R. K. (2014). Changes in the global value of ecosystem services. *Global Environmental Change*, 26 (2014), 152-158.

Courrau, J. (1997). *Estrategia de monitoreo de áreas protegidas de Centro América: resultados del primer taller de monitoreo de áreas protegidas de Centro América*. Tegucigalpa, Honduras: PROARCA & CAPAS.

Courrau, J. (1999). *Strategy for monitoring the management of protected areas in Central America*. Tegucigalpa, Honduras: PROARCA, CAPAS, CCAD, USAID.

De Faira, H. H. (1993). *Elaboración de un procedimiento para medir la efectividad de manejo de áreas silvestres protegidas y su aplicación en dos áreas protegidas de Costa Rica*. (Unpublished MSc dissertation). CATIE, Turrialba, Costa Rica.

- Cowan, G. I., Mpongoma, N., Britton, P (Eds.). (2010). *Management effectiveness of South Africa's protected areas*. Pretoria, South Africa: Department of Environmental Affairs of South Africa
- Deguignet, M., Juffe-Bignoli, D., Harrison, J., MacSharry, B., Kingston, N. (2014). *United Nations list of protected areas*. Cambridge, United Kingdom: UNEP-WCMC.
- Dudley, M. (Ed.). (2008). *Guidelines for applying protected area management categories*. Gland, Switzerland: IUCN.
- Dudley, M. (2010). Nature conservation: leaving space for biodiversity. In S. Stolton & N. Dudley (Eds.), *Arguments for protected areas: multiple benefits for conservation and use* (pp. 339-247). London, United Kingdom: Earthscan.
- Dudley, N., Belokurov, A., Borodin, O., Higgins-Zogib, L., Hockings, M., Lacerda, L., Stolton, S. (2004). *How effective are protected areas? A preliminary analysis of forest protected areas by WWF – the largest ever global assessment of protected area management effectiveness*. Gland, Switzerland: WWF International.
- Dudley, N., Belokurov, A., Higgins-Zogib, L., Hockings, M., Stolton, S., Burgess, N. (2007). *Tracking process in managing protected areas around the world. An analysis of two applications of the management effectiveness tracking tool developed by WWF and the World Bank*. Gland, Switzerland: WWF International.

- Dudley, M., Hockings, M., Stolton, S. (2004). Options for guaranteeing the effective management of the world's protected areas. *Journal of Environmental Policy and Planning*, 6 (2); 131-142.
- Dudley, N., Mulongoy, K. J., Cohen, S., Stolton, S., Barber, C. V., Gidda, S. B. (2005). *Towards effective protected area systems: an action guide to implement the Convention on Biological Diversity Programme of Work on Protected Areas*. Montreal, Canada: Secretariat of the Convention on Biological Diversity.
- Dudley, N., Parrish, J., Redford, K., Stolton, S. (2010). The revised IUCN protected area management categories: the debate and ways forward. *Oryx*, 44 (4), 485-490.
- Ervin, J. (2003). *Rapid assessment and prioritization of protected area management (RAPPAM) methodology*. Gland, Switzerland: WWF International.
- Ervin, J. (2003b). Rapid assessment of protected area management effectiveness in four countries. *BioScience*, 53 (9), 833-841.
- Geldmann, J., Barnes, M., Coad, L., Craigie, I. D., Hockings, M., Burgess, N. D. (2013). Effectiveness of terrestrial protected areas in reducing habitat loss and population declines. *Biological Conservation*, 161 (2013), 230-238.

- Getzner, M., Jugmeier, M., Pflieger, B. (2012) Evaluation management effectiveness of national parks as a contribution to good governance and social learning. In B. Sladonja (Ed.), *Protected area management*. (pp. 129-148). Vienna, Austria: InTech.
- Growcock, A. J., Sutherland, E. F., Stathis, P. T. (2009). Challenges and experiences in implementing a management effectiveness evaluation program in a protected area. *Australasian Journal of Environmental Management*, 16 (4), 218-226.
- Hancock, B., Ockleford, E., & Windridge, K. (2009). *An introduction to qualitative research* (2nd ed.). Nottingham, England: National Institute for Health Research.
- Hockings, M. (1998). Evaluating management of protected areas: integrating planning and evaluation. *Environmental Management*, 22 (3), 337-345.
- Hockings, M. (2003). Systems for assessing the effectiveness of management in protected areas. *BioScience*, 53 (9), 823-831.
- Hockings, M. (2004). Evaluating management effectiveness. In Mulongoy & Chape (Eds.), *Protected areas and biodiversity: an overview of key issues* (pp. 39-40). Montreal, Canada: United Nations Environmental Programme (UNEP).

- Hockings, M., Cook, C. N., Carter, R. W., James, R. (2009). Accountability, reporting, or management improvement? Developing of a state of the parks assessment system in New South Wales, Australia. *Environmental Management*, 43 (2009), 1013-1025.
- Hockings, M., Ervin, J., Vincent, G. (2004). Assessing the management of protected areas: the work of the world parks congress before and after Durban. *Journal of International Wildlife Law and policy*, 7 (2004), 31–42.
- Hockings, M., James, R., Stolton, S., Dudeley, N., Mathur, V., Makombo, J., Courrau, J., Parrish, J. (2008). *Enhancing our heritage toolkit: assessing management effectiveness of natural World Heritage Sites*. World heritage papers 23. Paris, France: UNESCO World Heritage Centre.
- Hockings, M., Leverington, F., & Cook, C. (2015). Protected area management effectiveness. In G. L. Worboys, M. Lockwood, A. Kothari, S. Feary, & I. Pulsford (Eds.), *Protected area governance and management* (pp.889-928). Canberra, Australia: ANU Press.
- Hockings, M., Stolton, S., & Dudley, N. (2000). *Evaluating effectiveness: a framework for assessing the management of protected areas*. Gland, Switzerland: IUCN.
- Hockings, M., Stolton, S., & Dudley, N. (2002). *Evaluating effectiveness: a summary for park managers and policy makers*. Queensland, Australia: WWF & IUCN.
- Hockings, M., Stolton, S., & Dudley, N. (2007). Management effectiveness: assessing management of protected areas?. *Journal of Environmental Policy & Planning*, 6 (2), 157-174.

Hockings, M., Stolton, S., Dudley, N., James, R. (2009). Data credibility: what are the “right” data for evaluating management effectiveness of PA?. *New directions for evaluation*, 122 (2009), 53-63.

Hockings, M., Stolton, S., Leverington, F., Dudley, N., Courrau, J. (2006). *Evaluating effectiveness: a framework for assessing management effectiveness of protected areas* (2nd Ed.). Gland, Switzerland & Cambridge, United Kingdom: IUCN

Hoekstra, J. M., Boucher, T. M., Ricketts, T. H., Roberts, C. (2005). Confronting a biome crisis: global disparities of habitat loss and protection. *Ecology letters*, 8 (2005), 23-29.

Hsieh, H., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative health research*, 15(9), 1277-1288.

IUCN. (1980). *World conservation strategy*. Gland, Switzerland: International Union for the Conservation of Nature.

IUCN. (2010). *50 Years of working for protected areas: a brief history of IUCN World Commission on protected areas*. Gland, Switzerland: IUCN.

IUCN. (2015). *IUCN world commission on protected areas*. Retrieved from: https://www.iucn.org/about/work/programmes/gpap_home/gpap_wcpa/

IUCN & TILCEPA. (2010). *Joint PAEL-TILCEPA workshop on protected areas management evaluation and social assessment of protected areas*. Gland, Switzerland: IUCN.

Izurieta, A. (1997). *Evaluación de la eficiencia del manejo de áreas protegidas: validación de una metodología aplicada a un subsistema de áreas protegidas y sus zonas de influencia, en el área de conservación Osa, Costa Rica*. (Unpublished MSc dissertation). CATIE, Turrialba, Costa Rica.

Jo Mulongoy, K., & Chape, S. (2004). *Protected areas and biodiversity: an overview of key issues*. Montreal, Canada: UNEP-WCMC.

Jonas, H.D., Barbuto, V., Jonas, H. C., Kothari, A., Nelson, F. (2014). New steps of change: looking beyond protected areas to consider other effective area based conservation measures. *Parks*, 20 (2), 111-127.

Joppa, L. N., & Pfaff, A. (2010). Global protected area impacts. *Proceedings of the Royal Society*, 2010 (1713), N. pag.

Juffe-Bignoli, D., Burgess, N. D., Bingham, H., Belle, E. M. S., de Lima, M. G., Deguignet, M., Bertzky, B., Miliam, 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., Kingston, N. (2014). *Protected planet report 2014: tracking progress towards global targets for protected areas*. Cambridge, United Kingdom: UNEP-WCMC.

Kinzig, A. P., Perrings, C., Chapin, F. S., Polasky, S., Smith, V. K., Tilman, D., Turner, B. L. (2011). Paying for ecosystem services – promise and peril. *Science*, 334 (2011), 603-604.

Krippendorff, K. (2013). *Content analysis: an introduction to its methodology* (3rd ed.). Thousand Oaks, CA: SAGE.

Kurdoglu, O., & Avcioglu Cokcaliskan, B. (2011). Assessing the effectiveness of protected area management in the Turkish Caucasus. *Journal of Biotechnology*, 19 (75), 17208-17222.

Leader-Williams, N., Harrison, J., & Green, M. J. B. (1990). Designing protected areas to conserve natural resources. *Science Progress*, 74 (294), 189-204.

Leadley, P. W., Krug, C. B., Alkemade, R., Pereira, H. M., Sumaila, U. R., Walpole, M., Marques, A., Newbold, T., The, L. S. L., van Kolck, J., Bellard, C., Januchowski-Hartley, S. R., Mumby, P. J. (2014). *Progress towards the Aichi Biodiversity Targets: an assessment of biodiversity trends, policy scenarios and key actions*. Quebec, Canada: Secretariat of the Convention on Biological Diversity.

Le Saout, S., Hoffmann, M., Shi, Y., Hughes, A., Bernard, C., Brooks, T. M., Bertsky, B., Butchart S. H. M., Stuart, S. N., Badman, T., Rodrigues, A. S. L. (2013). Protected areas and effective biodiversity conservation. *Science*, 342 (2013), 803-804.

Leverington, F., & Hockings, M. (2004). Evaluating the effectiveness of protected area management: the challenge of change. In C. V. Barber, K. R. Miller & M. Boness (Eds.), *Securing protected areas in the face of global change: issues and strategies* (pp. 169-213). Gland, Switzerland: IUCN-WCPA.

Leverington, F., Hockings, M., Courrau, J., Pavese, H., Lemos-Costa, K. (2007). *Management effectiveness evaluation in Latin America and the Caribbean - Part B: summary of methodologies*. Brisbane, Australia: OAS InterAmerican Biodiversity Information Network.

Leverington, F., Hockings, M., Lemos-Costa, K. (2008). *Management effectiveness evaluation in protected areas: report for the project 'global study into management effectiveness evaluation of protected areas'*. Gatton, Australia: The University of Queensland, TNC, WWF, IUCN-WCPA.

Leverington, F., Hockings, M., Pavese, H., Lemos-Costa, K., Courrau, J. (2008). *Management effectiveness evaluation in protected areas – a global study: overview of approaches and methodologies*. Gatton, Australia: The University of Queensland, TNC, WWF, IUCN-WCPA.

Leverington, F., Kettner, A., Nolte, C., Marr, M., Stolton, S., Pavese, H., Stoll-Kleemann, S., Hockings, M. (2010). *Protected area management effectiveness assessments in Europe: supplementary report*. Greifswald, Germany: University of Greifswald.

- Leverington, F., Lemos-Costa, K., Courrau, J., Pavese, H., Nolte, C., Marr, M., Coad, L., Burgess, N., Bomhard, B., Hockings, M., (2010). *Management effectiveness evaluation in protected areas – a global study* (2nd ed.). Gattton, Australia: The University of Queensland, TNC, WWF, IUCN-WCPA.
- Leverington, F., Lemos-Costa, K., Pavese, H. (2007). *Management effectiveness evaluation in Latin America and the Caribbean – Part C – Patterns in protected area management effectiveness*. Brisbane, Australia: OAS InterAmerican Biodiversity Information Network.
- Leverington, F., Lemos-Costa, K., Pavese, H., Lisle, A., Hockings, M. (2010). A global analysis of protected area management effectiveness. *Environmental management*, 46 (5), 685 – 698.
- Leverington, F., Pavese, H., Lemos-Costa, K. (2007). *Management effectiveness evaluation in Latin America and the Caribbean. Part A: overview and recommendations*. Brisbane, Australia: OAS InterAmerican Biodiversity Information Network.
- Locke, H., & Dearden, P. (2005). Rethinking protected area categories and the new paradigm, *Environmental conservation*, 32 (1), 1–10.
- Lopoukhine, N., Crawhall, N., Dudley, N., Figgs, P., Karibuhoye, C., Laffoley, D., Miranda Lodoño, J., MacKinnon, K., Sandwith, T. (2012). Protected areas: providing natural solutions to the 21st Century challenges. *S.A.P.I. EN.S*, 5 (2), 117-131.

MacKinnon, J., MacKinnon, K., Child, G., Thorsell, J. (Eds.). (1986). *Managing Protected Areas in the Tropics*. Cambridge, United Kingdom: IUCN- UNEP.

Marino, D., Marucci, A., Palmieri, M., Gaglioppa, P. (2015). Monitoring the Convention on Biological Diversity (CBD) framework using evaluation of effectiveness methods. The Italian case. *Ecological Indicators*, 55 (2012) 172-182.

Martin, A. S., & Rieger, J. F. (2003). *The parks in peril site consolidation scorecard: lessons from protected areas in Latin America and the Caribbean*. N.p.: TNC & USAID.

Mayring, P. (2014). Chapter 13 - qualitative content analysis: theoretical background and procedures. In A. Bikner-Ahsbahr, C. Knipping, & N. C. Presmeg (Eds.), *Approaches to qualitative research in mathematics education: examples of methodology and methods*. Berlin, Germany: Springer.

McNeeley, J. A., & Miller, K. R. (Eds.). (1984). *National parks, conservation, and development: the role of protected areas in sustaining society*. Washington, DC: Smithsonian Institution Press.

Moore, S. A., & Hockings, M. (2013). Australian protected areas and adaptive management: contributions by visitor planning frameworks and management effectiveness evaluations. *Australasian Journal of Environmental Management*, 20 (4), 270-284.

- Moore, S. A., & Walker, M. (2008). Processing the evaluation of management effectiveness for protected areas: two Australian case studies. *Journal of Environmental Policy and Planning*, 10 (4), 405-421.
- Mora, C., & Sale, P. F. (2011). Ongoing global biodiversity loss and the need to move beyond protected areas: a review of the technical and practical shortcomings of protected areas on land and sea. *Marine Ecology Progress Series*, 434, 251-266.
- Naughton-Treves, L., Buck Holland, M., Brandon, K. (2005). The role of protected areas in conserving biodiversity and sustaining local livelihoods. *Annual Reviews Environmental Resources*, 30 (2005), 219-252.
- Nolte, C. (2014). *Governance, management, and conservation success of protected areas in Brazil and Colombia* (Unpublished doctoral dissertation). University of Michigan.
- Nolte, C., Leverington, F., Kettner, A., Marr, M., Nielsen, G., Bomhard, B., Stolton, S., Stoll-Kleemann, S., Hockings, M. (2010). *Protected area management effectiveness assessments in Europe*. Bonn, Germany: Bundesamt für Naturschutz (BfN).
- Novo Torres, I. & Díaz Martín, D. (2007). *Mejorando nuestra herencia: final report of Canaima national park, Venezuela, World Heritage Site*. Caracas, Venezuela: UNESCO, IUCN, Inparuques.

- Pfleger, B. (2007). *European site consolidation scorecard – measuring the management effectiveness of European protected areas*. (Unpublished master dissertation). University of Klagenfurt, Klagenfurt, Austria.
- Phillips, A. (2000). Caring of the assets: the effectiveness of protected areas management. In WWF (Eds.), *The design and management of forest protected areas: papers presented at the beyond the trees conference 8 – 11 May 2000, Bangkok, Thailand*. (pp. 189-204). Bogor, Indonesia: WWF.
- Pimm, S. L., Jenkins, C. N., Abell, R., Brooks, T. M., Gittleman, J. L., Joppa, L. N., Raven, P. H., Roberts, C. M., Sexton, J. O. (2014). The biodiversity of species and their rates of extinction, distribution, and protection. *Science*, 344 (6187), 987-995.
- Porej, D., Piscevic, N., Orlovic-Lovren, V. (2009). Protected area management effectiveness in Serbia. Serbia: Ministry of Environment and Spatial Planning of Republic of Serbia & Mediterranean Programme WWF.
- Reed, M. G., & Eguny, F. (2012). Management effectiveness in UNESCO biosphere reserves: learning from Canadian periodic reviews. *Environmental Science and Policy*, 25 (2013), 107-117.
- Rivero-Blanco, C. (1992). The evaluation of natural protected area systems: a numeric method. *Parks*, 3 (1992), 11-13.

Secretariat of the Convention on Biological Diversity. (2004). *CBD programmes of work: programme of work on protected areas*. Montreal, Canada: Secretariat of the Convention on Biological Diversity.

Secretariat of the Biological Convention. (2008). *Protected areas in today's world: their values and benefits for the welfare of the planet*. Quebec, Canada: Secretariat of the Convention on Biological Diversity.

Secretariat of the Convention on Biological Diversity. (2011). *Strategic plan for biodiversity 2011 – 2020 and the Aichi Targets*. Montreal, Canada: Secretariat of the Convention on Biological Diversity.

Seychelles Island Foundation. (2007). *Enhancing our heritage: Final assessment Aldabra atoll Seychelles*. Seychelles: UNESCO, IUCN, Seychelles Island Foundation.

Stoll-Kleemann, S. (2010). Evaluation of management effectiveness in protected areas: methodologies and results. *GfÖ Basic and Applied Ecology*, 11 (2010), 377-382.

Stolton, S. (Ed.). (2008). *Assessment of management effectiveness in European protected areas – Sharing experiences and promoting good management*. Rügen, Germany: German Federal Agency for Nature Conservation & International Academy for Nature Conservation.

Stolton, S. & Dudley, N. (Eds.). (2010). *Arguments for protected areas: multiple benefits for conservation and use*. London, United Kingdom: Earthscan.

Stolton, S., Hockings, M., Dudley, N., MacKinnon, K., Whitten, T., Leverington, F. (2007). *Management effectiveness tracking tool*. Gland, Switzerland: WWF International.

Taylor-Powell, E. 2008. *Ways to answer choices in questionnaires*. Retrieved from <http://www.uwex.edu/ces/4h/evaluation/documents/Waystowordanswerschoicesinquestionnaires.pdf>

The Nature Conservancy. (2003). *Measuring success: the parks in peril site consolidation scorecard manual*. Arlington, VA: The Nature Conservancy.

United Nations. (1992). *Convention on Biological Diversity*. Rio de Janeiro, Brazil: UN.

United Nations Environment Programme. (2014). *New UNEP report unveils world on track to meet 2020 target for protected areas on land and sea*. Retrieved from: <http://www.unep-wcmc.org/news/new-unep-report-unveils-world-on-track-to-meet-2020-target-for-protected-areas-on-land-and-sea>

Venter, O., Fuller, R. A., Segan, D. B., Carwardine, J., Brooks, T., Butchart, S. H. M., Di Marco, M., Iwamura, T., Joseph, L., O'Grady, D., Possingham, H. P., Rondinini, C., Smith, R. J., Venter, M., Watson, J. E. M. (2014). Targeting global protected area expansion for imperilled biodiversity. *PLoS Biol*, 12 (6), 1-7.

Worboys, G. L., & Trzyna, T. (2015). Managing protected areas. In G. L. Worboys, M. Lockwood, A. Kothari, S. Feary & I. Pulsford (Eds.), *Protected area governance and management* (pp. 207-250). Canberra, Australia: ANU Press.

Yunia, C. (n.d.). The status of Indonesian MPAs: monitoring effectiveness. In conference of the International Coral Reef Initiative. Indonesia.

Appendices

The Strategic Plan is comprised of a shared vision, a mission, strategic goals and 20 ambitious yet achievable targets, collectively known as the Aichi Targets. The Strategic Plan serves as a flexible framework for the establishment of national and regional targets and it promotes the coherent and effective implementation of the three objectives of the Convention on Biological Diversity.

THE VISION

“By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.”

The Aichi Biodiversity Targets

Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society



By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.



By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.



By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socioeconomic conditions.



By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use



By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.



By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.



By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.



By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.



By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.



By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Strategic Goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity



By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent 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

THE MISSION

“Take effective and urgent action to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet’s variety of life, and contributing to human well-being, and poverty eradication. To ensure this, pressures on biodiversity are reduced, ecosystems are restored, biological resources are sustainably used and benefits arising out of utilization of genetic resources are shared in a fair and equitable manner; adequate financial resources are provided, capacities are enhanced, biodiversity issues and values mainstreamed, appropriate policies are effectively implemented, and decision-making is based on sound science and the precautionary approach.”

of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.



By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.



By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services.



By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.



By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.



By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building



By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.



By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.



By 2020, knowledge, the science base and technologies relating to biodiversity, its values functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.



By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.

Please feel free to use the Aichi Biodiversity Targets icons in your own materials. More details at www.cbd.int/sp

(Secretariat on the Convention on Biological Diversity, 2011).

Appendix 2: Matrix used for the analysis of methodologies

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Context	Threats	Indicator	List of threats (generated by participants). Evaluation of their: existence, probability, extent, impact, permanence and degree.	List of threats and list PA's values affected by threats generated by participants. Evaluation of their potential, causes, extent and severity. They propose actions and prioritise them.	n/a	
			How is it measured	Nominal scale: Development of list Ordinal scale using: Existence: Will or will not be a threat in 5 years Probability: Very low-low-medium-high-very high. Extent: Throughout-widespread-scattered-localised Impact: Severe-high-moderate-mild Permanence: Permanent-long term-medium term-short term The degree is calculated combining the ratings of all the other characteristics.	Nominal scale: Development of list of threats, values affected, causes and impacts. Proposition of actions. Ordinal scale using: Probability: Current or potential Extent and severity measured using: Low-medium-high-very high Prioritisation of actions	n/a	
	Context	Threats	Sources	**	**	**	-
			Detail	+++	+++	+++	-
	Context	Threats	Indicator	List of pressures generated by participants. Evaluation of their: existence, tendency, extent, impact, permanence and degree.	List of pressures generated by participants. Evaluation of their: existence, tendency, extent, impact, permanence and degree.	n/a	n/a
			How is it measured	Nominal scale: Development of list Ordinal scale using: Has or has not been a pressure in the last 5 years In the past 5 years has: Increased sharply-increased slightly-remained constant-decreased slightly-decreased sharply. Extent: Throughout-widespread-scattered-localised Impact: Severe-high-moderate-mild Permanence: Permanent-long term-medium term-short term The degree is calculated combining the ratings of all the other characteristics.	Nominal scale: Development of list Ordinal scale using: Has or has not been a pressure in the last 5 years In the past 5 years has: Increased sharply-increased slightly-remained constant-decreased slightly-decreased sharply. Extent: Throughout-widespread-scattered-localised Impact: Severe-high-moderate-mild Permanence: Permanent-long term-medium term-short term The degree is calculated combining the ratings of all the other characteristics.	n/a	n/a
	Context	Threats	Sources	**	**	**	-
			Detail	+++	+++	+++	-

Theme	Element	Criterion	Indicators				SCSC	
			METT	RAPPAM	EoH	SCSC		
Design and planning	Context	Threats	Indicator	n/a	n/a	n/a	Existence of a systematic analysis that identifies threat, ranks them and addresses them.	
			How is it measured	n/a	n/a	n/a	Ordinal scale using: 5.Threats are identified, ranked and addressed. 4.Threats are identified, ranked and strategies are drafted 3.Threat analysis no strategies 2.Threat analysis underway 1.No threat analysis	
			Sources Detail	-	-	-	*	
			Sources Detail	-	-	-	++	
			Indicator	Threats from human settlement or other non-agricultural land uses with substantial footprint: Housing and settlement	n/a	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a
			Sources Detail	*	-	-	-	
			Sources Detail	+	-	-	-	
			Indicator	Threats from human settlement or other non-agricultural land uses with substantial footprint: Commercial and industrial areas	n/a	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a
			Sources Detail	*	-	-	-	
			Sources Detail	+	-	-	-	
			Indicator	Threats from human settlement or other non-agricultural land uses with substantial footprint: Tourism and recreation infrastructure	n/a	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a
			Sources Detail	*	-	-	-	
			Sources Detail	+	-	-	-	
			Indicator	Threats from farming and grazing as a result of agricultural expansion and intensification, including silviculture, mariculture, aquaculture: Annual and perennial non-timber crop cultivation	n/a	n/a	n/a	n/a
How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a			
Sources Detail	*	-	-	-				
Sources Detail	+	-	-	-				

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Context	Threats	Indicator	Threats from farming and grazing as a result of agricultural expansion and intensification, including silviculture, mariculture, aquaculture: Drug cultivation	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from farming and grazing as a result of agricultural expansion and intensification, including silviculture, mariculture, aquaculture: Wood and pulp plantations	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	*	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from farming and grazing as a result of agricultural expansion and intensification, including silviculture, mariculture, aquaculture: Livestock farming and grazing	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from farming and grazing as a result of agricultural expansion and intensification, including silviculture, mariculture, aquaculture: Marine and freshwater aquaculture	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
Indicator	Threats from production of non-biological resources: Oil and gas drilling	n/a	n/a	n/a			
How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a			
Sources	**	-	-	-			
Detail	+	-	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Context	Threats	Indicator			n/a	n/a
			How is it measured	Threats from production of non-biological resources: Mining and quarrying	n/a	n/a	n/a
			Sources				
			Detail				
			Indicator	Threats from production of non-biological resources: Energy generation including hydropower dams	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from long narrow transport corridors and the vehicles that use them, including associated wildlife mortality: Roads and railroads	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from long narrow transport corridors and the vehicles that use them, including associated wildlife mortality: Utility and service lines (e.g. Electricity & phone cables, etc.)	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from long narrow transport corridors and the vehicles that use them, including associated wildlife mortality: Shipping lanes and canals	n/a	n/a	n/a
How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a			
Sources	**	-	-	-			
Detail	+	-	-	-			

Theme	Element	Criterion	Indicators					
			METT	RAPPAM	EoH	SCSC		
Design and planning	Context	Threats	Indicator	n/a	n/a	n/a	n/a	
			How is it measured	Threats from long narrow transport corridors and the vehicles that use them, including associated wildlife mortality: Flight paths	n/a	n/a	n/a	n/a
			Sources	Ordinal scale using: High - medium - low - n/a	-	-	-	-
			Detail	**	-	-	-	-
			Indicator	Threats from consumptive use of "wild" biological resources, including both deliberate and unintentional harvesting effects; also persecution or control of specific species: Hunting, killing and collecting terrestrial animals (including killing of animals as a result of human/wildlife conflict)	n/a	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a
			Sources	**	-	-	-	-
			Detail	++	-	-	-	-
			Indicator	Threats from consumptive use of "wild" biological resources, including both deliberate and unintentional harvesting effects; also persecution or control of specific species: Gathering terrestrial plants or plant products (non-timber)	n/a	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a
			Sources	**	-	-	-	-
			Detail	++	-	-	-	-
Indicator	Threats from consumptive use of "wild" biological resources, including both deliberate and unintentional harvesting effects; also persecution or control of specific species: Logging and wood harvesting	n/a	n/a	n/a	n/a			
How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a			
Sources	**	-	-	-	-			
Detail	++	-	-	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Context	Threats	Indicator	Threats from human activities that alter, destroy or disturb habitats and species associated with non-consumptive uses of biological resources: Deliverate vandalism, destructive activities or threats to PA staff and visitors	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from other actions that convert or degrade habitat or change the way the ecosystem functions: Fire and fire suppression (including arson)	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from other actions that convert or degrade habitat or change the way the ecosystem functions: Dams, hydrological modification and water management / use	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from other actions that convert or degrade habitat or change the way the ecosystem functions: Increased fragmentation within PA	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
Detail	+	-	-	-			
Indicator	Threats from other actions that convert or degrade habitat or change the way the ecosystem functions: Isolation from other natural habitats (e.g. deforestation, dams without effective aquatic wildlife passages)	n/a	n/a	n/a			
How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a			
Sources	*	-	-	-			
Detail	+	-	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Context	Threats	Indicator	Threats from other actions that convert or degrade habitat or change the way the ecosystem functions: Other "edge" effects on park values	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from other actions that convert or degrade habitat or change the way the ecosystem functions: Loss of keystone species (e.g. top predators, pollinators, etc.)	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	***	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from terrestrial and aquatic non-native and native plants, animals, pathogens/microbes or genetic material that have or are predicted to have harmful effects on biodiversity following introduction, spread and/or increase: Invasive non-native/alien plants (weeds)	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from terrestrial and aquatic non-native and native plants, animals, pathogens/microbes or genetic material that have or are predicted to have harmful effects on biodiversity following introduction, spread and/or increase: Invasive non-native/alien animals	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
Detail	+	-	-	-			
Indicator	Threats from terrestrial and aquatic non-native and native plants, animals, pathogens/microbes or genetic material that have or are predicted to have harmful effects on biodiversity following introduction, spread and/or increase: Pathogens (non-native or native but creating new/increased problems)	n/a	n/a	n/a			
How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a			
Sources	***	-	-	-			
Detail	+	-	-	-			

Theme	Element	Criterion	Indicators					
			METT	RAPPAM	EoH	SCSC		
Design and planning	Context	Threats	Indicator	n/a	n/a	n/a	n/a	
			How is it measured	Threats from terrestrial and aquatic non-native and native plants, animals, pathogens/microbes or genetic material that have or are predicted to have harmful effects on biodiversity following introduction, spread and/or increase: Introduced genetic material (e.g. genetically modified organisms)	n/a	n/a	n/a	n/a
			Sources	Ordinal scale using: High - medium - low - n/a	-	-	-	-
			Detail	**	-	-	-	-
			Indicator	Threats from introduced exotic and/or excess materials or energy from point and non-point sources: House hold sewage and urban waste water	n/a	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a
			Sources	**	-	-	-	-
			Detail	+	-	-	-	-
			Indicator	Threats from introduced exotic and/or excess materials or energy from point and non-point sources: Sewage and waste water from PA facilities	n/a	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a
			Sources	*	-	-	-	-
			Detail	+	-	-	-	-
			Indicator	Threats from introduced exotic and/or excess materials or energy from point and non-point sources: Industrial, mining and military effluents and discharges (e.g. Poor water quality discharge from dams)	n/a	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a
			Sources	**	-	-	-	-
			Detail	+	-	-	-	-
Indicator	Threats from introduced exotic and/or excess materials or energy from point and non-point sources: Agricultural and forestry effluents	n/a	n/a	n/a	n/a			
How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a			
Sources	**	-	-	-	-			
Detail	+	-	-	-	-			

Theme	Element	Criterion	Indicators				
			MeTT	RAPPAM	EoH	SCSC	
Design and planning	Context	Threats	Indicator	Threats from introduced exotic and/or excess materials or energy from point and non-point sources: Garbage and solid waste	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from introduced exotic and/or excess materials or energy from point and non-point sources: Air-bourne pollutants	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	***	-	-	-
			Detail	+	-	-	-
			Indicator	Threats from introduced exotic and/or excess materials or energy from point and non-point sources: Excess energy (e.g. Heat pollution, lights, etc.)	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Geological events may be part of natural disturbance regimes in many ecosystems. But they can be a threat if a species or habitat is damaged and has lost its resilience and is vulnerable to disturbance: Volcanoes	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	*	-	-	-
Detail	+	-	-	-			
Indicator	Geological events may be part of natural disturbance regimes in many ecosystems. But they can be a threat if a species or habitat is damaged and has lost its resilience and is vulnerable to disturbance: Earthquakes / Tsunamis	n/a	n/a	n/a			
How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a			
Sources	*	-	-	-			
Detail	+	-	-	-			

Theme	Element	Criterion	Indicators					
			METT	RAPPAM	EoH	SCSC		
Design and planning	Context	Threats	Indicator	n/a	n/a	n/a	n/a	
			How is it measured	Geological events may be part of natural disturbance regimes in many ecosystems. But they can be a threat if a species or habitat is damaged and has lost its resilience and is vulnerable to disturbance: Avalanches / Landslides	n/a	n/a	n/a	n/a
			Sources	Ordinal scale using: High - medium - low - n/a	-	-	-	-
			Detail	*	-	-	-	-
			Indicator	Geological events may be part of natural disturbance regimes in many ecosystems. But they can be a threat if a species or habitat is damaged and has lost its resilience and is vulnerable to disturbance: Erosion and siltation / deposition	n/a	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	-	-	-	-
			Sources	*	-	-	-	-
			Detail	+	-	-	-	-
			Indicator	Threats from long-term climatic changes which may be linked to global warming and other severe climatic/weather events outside of the natural range of variation: Habitat shifting and alteration	n/a	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a
			Sources	*	-	-	-	-
			Detail	+	-	-	-	-
			Indicator	Threats from long-term climatic changes which may be linked to global warming and other severe climatic/weather events outside of the natural range of variation: Droughts	n/a	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a
			Sources	*	-	-	-	-
Detail	+	-	-	-	-			
Indicator	Threats from long-term climatic changes which may be linked to global warming and other severe climatic/weather events outside of the natural range of variation: Temperature extremes	n/a	n/a	n/a	n/a			
How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a	n/a			
Sources	*	-	-	-	-			
Detail	+	-	-	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Context	Threats	Indicator		n/a	n/a	n/a
			How is it measured	Threats from long-term climatic changes which may be linked to global warming and other severe climatic/weather events outside of the natural range of variation: Storms and flooding	n/a	n/a	n/a
			Sources	Ordinal scale using: High - medium - low - n/a	-	-	-
			Detail	*	-	-	-
			Indicator	Specific cultural and social threats: Loss of cultural links, traditional knowledge and/or management practices	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	***	-	-	-
			Detail	++	-	-	-
			Indicator	Specific cultural and social threats: Natural deterioration of important cultural site values	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Indicator	Specific cultural and social threats: Destruction of cultural heritage buildings, gardens, sites, etc.	n/a	n/a	n/a
			How is it measured	Ordinal scale using: High - medium - low - n/a	n/a	n/a	n/a
			Sources	**	-	-	-
			Detail	+	-	-	-
			Total	52	2	1	1
			Sources	L=16 M=28 H=8	L=0 M=2 H=0	L=0 M=1 H=0	L=1 M=0 H=0
			Detail	L=47 M=5 H=0	L=0 M=0 H=2	L=0 M=0 H=1	L=0 M=1 H=0
			Indicator	n/a	n/a	n/a	n/a
How is it measured	Major site values: including biodiversity values, other natural values, cultural values, economic values, educational values, and other social values.	n/a	n/a	n/a			
Sources	Nominal scale: Participants generate a list to identify major site values, they recognise which of those are WHS particular values and identify their criteria numbers. The listed values are linked to PA's management objectives, when possible.	n/a	n/a	n/a			
Detail	*	-	+	-			
Detail	++	-	++	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Context	Values and significance	Indicator	n/a	PA contains relatively high number of rare, threatened, or endangered species	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	PA has relatively high levels of biodiversity	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	PA has relatively high degree of endemism	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	PA provides a critical landscape function	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	PA contains the full range of plant and animal diversity	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	PA significantly contributes to the representativeness of the PA system	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
Indicator	n/a	PA sustains minimum viable populations of key species	n/a	n/a			
How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a			
Sources	-	***	-	-			
Detail	-	+	-	-			
Indicator	n/a	Structural diversity of the PA is consistent with historic norms	n/a	n/a			
How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a			
Sources	-	***	-	-			
Detail	-	+	-	-			

Theme	Element	Criterion	Indicators					
			METT	RAPPAM	EoH	SCSC		
Design and planning	Context	Stakeholders attitudes and relations	Indicator	n/a	Local communities depend upon the PA resources for their subsistence	Extent of dependency of stakeholders on site values for economic or other benefits	n/a	
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	Nominal scale: E.g. List of stakeholder and how they depend on site.	n/a	
			Sources	-	*	*	-	-
			Detail	-	+	+	-	-
			Indicator	n/a	n/a	Site management's relationship with stakeholder groups	n/a	n/a
			How is it measured	n/a	n/a	Nominal scale: Description of site management's willingness & capacity (including resources) to engage with stakeholders.	n/a	n/a
			Sources	-	-	*	-	-
			Detail	-	-	+	-	-
			Indicator	n/a	n/a	Nature and extent of negative physical impacts of stakeholders	n/a	n/a
			How is it measured	n/a	n/a	Nominal scale: List of negative impacts stakeholders have on site values, describing their nature and extent. Include any legal or illegal activities.	n/a	n/a
			Sources	-	-	**	-	-
			Detail	-	-	++	-	-
			Indicator	n/a	n/a	Nature and extent of positive impacts of stakeholders on site values	n/a	n/a
			How is it measured	n/a	n/a	Nominal scale: List of positive impacts of stakeholders' groups on site values. E.g. Alerts, opportunities for connectivity, conservation efforts.	n/a	n/a
			Sources	-	-	**	-	-
			Detail	-	-	+	-	-
			Indicator	n/a	n/a	Negative impacts of site on stakeholders	n/a	n/a
			How is it measured	n/a	n/a	Nominal scale: List of negative impacts on stakeholder groups due to establishment or management of the area.	n/a	n/a
			Sources	-	-	**	-	-
			Detail	-	-	+	-	-
Indicator	n/a	n/a	Issues affecting stakeholders and the site	n/a	n/a			
How is it measured	n/a	n/a	Nominal scale: List and description of issues affecting stakeholders and site.	n/a	n/a			
Sources	-	-	*	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Context	Stakeholders attitudes and relations	Detail	-	-	+	-
			Indicator	n/a	n/a	Stakeholders' relative political and cultural leverage or influence on site values	n/a
			How is it measured	n/a	n/a	Nominal scale: List of stakeholders and their political, social and cultural influence in site values.	n/a
			Sources	-	-	*	-
			Detail	-	-	+	-
			Indicator	n/a	PA has religious or spiritual significance	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	PA has unusual features or aesthetic importance	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	PA contributes significant ecosystem services and benefits to community	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Total	0	5	7	0
			Sources	L=0 M=0 H=0	L=5 M=0 H=0	L=4 M=3 H=0	L=0 M=0 H=0
			Detail	L=0 M=0 H=0	L=5 M=0 H=0	L=6 M=1 H=0	L=0 M=0 H=0
			Indicator	n/a	Law enforcement is low in the region	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	Bribery and corruption is common throughout the region	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
Detail	-	+	-	-			
Indicator	n/a	The area experiences civil unrest and/or political instability	n/a	n/a			
How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a			
Sources	-	*	-	-			
Detail	-	+	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Context	Influence of external environment	Indicator	n/a	Cultural practices, beliefs, and traditional uses conflict with PA's objectives	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	Market value of PA resources is high	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	The area is easily accessible for illegal activities	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	There is a strong demand for vulnerable PA resources	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	PA manager is under pressure to unduly exploit PA resources	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
Indicator	n/a	Recruitment and retention of employees is difficult	n/a	n/a			
How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a			
Sources	-	*	-	-			
Detail	-	+	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Context	Influence of external environment	Indicator	n/a	n/a	n/a	Conservation policy agenda development at national/regional/local levels
			How is it measured	n/a	n/a	n/a	Ordinal scale using: 5.Conservation policies that promote park security being actively pursued at all levels. 4.Plan for conservation policies that promote park security has been completed, policies being actively pursued at some levels. 3.Plan for securing appropriate conservation policies completed. 2.No formal plan developed for promoting appropriate conservation policies, however action being taken on as-needed basis to develop policies that promote park security. 1.No action being taken to develop or promote conservation policies for park security.
			Sources	-	-	-	*
			Potential	-	-	-	+
			Indicator	n/a	n/a	PA and WHS national legislation	n/a
			How is it measured	n/a	n/a	Nominal scale: List and include a brief description of national PA and WHS legislation and policies. Conduct an analysis of strengths and weaknesses.	n/a
			Sources	-	-	*	-
			Detail	-	-	++	-
			Indicator	n/a	n/a	Conservation legislation within government policy	n/a
			How is it measured	n/a	n/a	Nominal scale: List and include a brief description of national conservation legislation and policies. Conduct an analysis of strengths and weaknesses.	n/a
			Sources	-	-	*	-
			Detail	-	-	++	-
			Indicator	n/a	n/a	International conservation conventions and treaties	n/a
			How is it measured	n/a	n/a	Nominal scale: List and include a brief description of signed treaties or conventions. Conduct an analysis of strengths and weaknesses.	n/a
			Sources	-	-	*	-
Detail	-	-	++	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Context	Influence of external environment	Indicator	n/a	n/a	National legislation for the support of WHS	n/a
			How is it measured	n/a	n/a	Nominal scale: List and include a brief description of national legislation or policy which encourages government support for WHS. Conduct an analysis of strengths and weaknesses.	n/a
			Sources	-	-	*	-
			Detail	-	-	++	-
			Indicator	n/a	n/a	National legislation regarding PA & WHS management authorities	n/a
			How is it measured	n/a	n/a	Nominal scale: List and include a brief description of national legislation regarding PA & WHS managers. Conduct an analysis of strengths and weaknesses.	n/a
			Sources	-	-	*	-
			Detail	-	-	++	-
			Total	0	9	5	1
			Sources	L=0 M=0 H=0	L=9 M=0 H=0	L=5 M=0 H=0	L=1 M=0 H=0
			Detail	L=0 M=0 H=0	L=9 M=0 H=0	L=0 M=5 H=0	L=1 M=0 H=0
			Indicator	PA has a legal status	PA has a long term legally binding protection	Legal status and tenure	Official declaration of PA status
Planning	Legal status	Ordinal scale using: 3. PA has been formally gazetted/covenanted. 2. PA is in process of being gazetted/covenanted. 1. There is an agreement that the PA should be gazetted/covenanted, the process has not yet begun. 0. PA is not gazetted/covenanted.	How is it measured	yes-mostly no- no	Nominal scale: Explanation current situation and how it affects management capacity. Analysis of the strengths and weaknesses of the legal status and land tenure.	Ordinal scale using: 5. Official declaration of PA obtained at appropriate level with boundaries correctly demarcated. 4. Proposal for official declaration with boundaries correctly demarcated submitted to proper authorities, no declaration yet. 3. Proposal for declaration being prepared with boundaries correctly demarcated. 2. PA decree exists, boundaries incorrectly demarcated. 1. No PA decree exists.	
			Sources	*	*	*	
			Detail	+	+	++	

Theme	Element	Criterion	Indicators					
			METT	RAPPAM	EoH	SCSC		
Design and planning	Planning	Indicator	PA boundaries known and demarcated	Boundary demarcation is adequate to meet PA objectives	n/a	n/a		
		Legal status	How is it measured	Ordinal scale using: 3. Boundary of PA known by management authority and local residents/neighbouring land users and is appropriately demarcated. 2. Boundary of PA known by management authority and local residents/neighbouring land users but it is not appropriately demarcated. 1. Boundary of PA known by management authority but it is not known by local residents/neighbouring land users. 0. Boundary of PA is not known by management authority or local residents/neighbouring land users.	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a	
				Sources	**	*	-	-
				Detail	++	+	-	-
		Legal status	Total	2	2	1	1	
				Sources	L=1 M=1 H=0	L=2 M=0 H=0	L=1 M=0 H=0	L=1 M=0 H=0
				Detail	L=1 M=1 H=0	L=2 M=0 H=0	L=0 M=1 H=0	L=0 M=1 H=0
		Indicator	n/a	No unsettle disputes regarding land tenure or use rights	n/a	Land tenure issues		
		Tenure issues	How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	Ordinal scale using: 5. More complete land tenure information mapped and used by site manager. 4. Some land tenure information available and being used by site manager. 3. Some land tenure information available but no in use by site manager. 2. Inadequate access to land tenure information. 1. Land tenure information not available from any source.	
				Sources	-	*	-	*
				Detail	-	++	-	++
		Tenure issues	Total	0	1	0	1	
Sources	L=0 M=0 H=0			L=1 M=0 H=0	L=0 M=0 H=0	L=1 M=0 H=0		
Detail	L=0 M=0 H=0			L=0 M=1 H=0	L=0 M=0 H=0	L=0 M=1 H=0		

Theme	Element	Criterion	Indicators			
			METT	RAPPAM	EoH	SCSC
Design and planning	Adequacy of legislation	Indicator	n/a	n/a	Legislation affecting community participation in site management and sharing of benefits	n/a
		How is it measured	n/a	n/a	Nominal scale: List and include a brief description of legislation, policies, treaties or conventions regarding communities' involvement in WHS. Conduct an analysis of strengths and weaknesses.	n/a
		Sources Detail	-	-	*	-
		Total	0	0	++	0
	Adequacy of legislation	Sources	L=0 M=0 H=0	L=0 M=0 H=0	L=1 M=0 H=0	L=0 M=0 H=0
		Detail	L=0 M=0 H=0	L=0 M=0 H=0	L=0 M=1 H=0	L=0 M=0 H=0
	Management planning	Indicator	n/a	n/a	Existence of management plan	n/a
		How is it measured	n/a	n/a	Nominal scale: List of management plans (general management plan, annual operative plan, monitoring plan, etc.), their year of preparation of most recent review, year for next review and comments. Ordinal scale for level of approval: 5. Force of law. 4. Approved by government but not a legal instrument. 3. Approved by head of Agency level. 2. Approved at senior level within the agency. 1. The plan is a draft and it has not been approved formally.	n/a
		Sources Detail	-	-	*	-
		Indicator	n/a	Comprehensive, relatively recent written management plan	n/a	n/a
How is it measured		n/a	Ordinal scale using: yes-mostly no- no	n/a	n/a	
Sources Detail		-	++	-	-	

Theme	Element	Criterion	Indicators			
			METT	RAPPAM	EoH	SCSC
			n/a	n/a	The management plan provides an adequate and appropriate policy environment for management of site	n/a
			n/a	n/a	Ordinal scale using: 4. Very Good: Policy requirements for the site are identified and adequate and appropriate policies are established with clear linkages to the desired future of the site. 3. Good: Policy requirements for the site are identified and policies are largely adequate and appropriate although there are gaps. 2. Fair: Policies in the plan are inadequate or incomplete in many aspects. 1. Poor: Plan either doesn't establish policies for the area or policies are inadequate or inappropriate in major aspects.	n/a
		Sources	-	-	*	-
		Detail	-	-	++	-
		Indicator	n/a	n/a	The management plan is integrated /linked to other significant national/regional/sectorial plans that influence management of the site	n/a
			n/a	n/a	Ordinal scale using: 4. Very Good: Relevant national/ regional/ sectorial plans that affect the site are identified and specific mechanisms are included to provide for integration or linkage now and in the future. 3. Good: Relevant national/regional/ sectorial plans that affect the site are identified, their influence on the site is taken into account, but there is little attempt at integration. 2. Fair: Some relevant national/regional/ sectorial plans that affect the site are identified but there is no attempt at integration. 1. Poor: Other plans affecting the site are not taken into account.	n/a
		Sources	-	-	*	-
		Detail	-	-	++	-
		Indicator	n/a	PA objectives provide for the protection and maintenance of biodiversity	n/a	n/a
		How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
		Sources	-	*	-	-
		Detail	-	+	-	-

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Planning	Management planning	Indicator	n/a	Specific biodiversity-related objectives are clearly stated in the management plan	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	n/a	Values of the site identified in management plan and linked to management objectives and disired outcomes	n/a
			How is it measured	n/a	n/a	Ordinal scale using: Very Good: The site values have been clearly identified and linked to well-defined management objectives and desired outcomes of the site. Good: The site values have been reasonably identified and linked to management objectives and desired outcomes of the site. Fair: The site values have not been clearly identified or linked to management objectives and desired outcomes of the site. Poor: The site values have not been identified.	n/a
			Sources	-	-	*	-
			Detail	-	-	++	-
			Indicator	n/a	Management policies and plans are consistent with PA objectives	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	PA employees and administrators understand the PA objectives and policies	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
Detail	-	+	-	-			
Indicator	n/a	Local communities support the overall objectives of the PA	n/a	n/a			
How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a			
Sources	-	*	-	-			
Detail	-	+	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Planning	Management planning	Indicator	n/a	Detailed work plan identifies specific targets for achieving management objectives	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	Analysis of and strategy for addressing PA threats and pressures	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	++	-	-
			Indicator	n/a	The management plan establishes a clear understanding of the desired outcomes in clear terms, rather than just specifying actions to be taken	n/a	n/a
			How is it measured	n/a	Ordinal scale using: 4. Very Good: Desired outcomes are explicitly articulated. 3. Good: Desired outcomes are reasonably articulated. 2. Fair: Desired outcomes are not clearly articulated but are implied or can be inferred from plan objectives. 1. Poor: Plan focuses more on actions and doesn't indicate the desired outcomes.	n/a	n/a
			Sources	-	-	*	-
			Detail	-	-	+	-
Indicator	n/a	The management plan express desired future for the site in a way that can assist management of new issues and opportunities that arise during the life of the plan	n/a	n/a			
How is it measured	n/a	Ordinal scale using: 4. Very Good: Desired future is expressed in a way that provides clear guidance for addressing new issues and opportunities. 3. Good: Desired future is expressed in a way that gives some guidance for addressing new issues and opportunities. 2. Fair: Desired future is not clearly articulated and provides only limited guidance for addressing new threats and opportunities. 1. Poor: Plan focuses more on present issues and doesn't provide guidance for addressing new threats and opportunities.	n/a	n/a			
Sources	-	-	*	-			
Detail	-	-	+	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Planning	Management planning	Indicator	n/a	n/a	The management plan provides a process for monitoring, review and adjustment, during the life of the plan	n/a
			How is it measured	n/a	n/a	Ordinal scale using: 4. Very Good: Plan provides a clear, explicit and appropriate process for monitoring, review and adjustment. 3. Good: provisions for monitoring, review and adjustment of the plan are present but are incomplete, unclear or inappropriate in some minor aspects. 2. Fair: Need for monitoring, review and adjustments is recognised but not dealt with in sufficient detail. 1. Poor: Plan does not address the need for monitoring, review and adjustment.	n/a
			Sources	-	-	*	-
			Detail	-	-	+	-
			Indicator	n/a	n/a	The management plan is based on adequate and relevant information base	n/a
			How is it measured	n/a	n/a	Ordinal scale using: 4. Very Good: The information base is up to date and adequate in scope and depth, and is matched to the major decisions, policies and issues addressed in the plan. 3. Good: The information base is adequate in scope and depth but maybe a little outdated and/or contains irrelevant information (i.e. broad compilation of data rather than matching information to the decisions, policies and issues addressed in the plan). 2. Fair: The information base is out of date and/or has inadequacies in scope or depth so that some issues, decisions and policies cannot be placed in context. 1. Poor: Very little information relevant to plan decisions exists.	n/a
			Sources	-	-	*	-
			Detail	-	-	++	-

Theme	Element	Criterion	Indicators			
			METT	RAPPAM	EoH	SCSC
		Indicator	n/a	n/a	The management plan addresses primary issues faced by the management of site within the context of the desired future of the site	n/a
		How is it measured	n/a	n/a	Ordinal scale using: 4. Very Good: The plan identifies primary issues for the site and deals with them within the context of the desired future for the site (i.e. plan is outcome, rather than issue driven). 3. Good: Plan identifies primary issues of the site but tends to deal with them in isolation or not within the context of the desired future of the site. 2. Fair: Some significant issues for the site are not addressed in the plan or the issues are not adequately addressed. 1. Poor: Many significant issues are not addressed or are inadequately dealt with in the plan.	n/a
Design and planning	Management planning	Sources	-	-	*	-
		Detail	-	-	+	-
		Indicator	n/a	n/a	Objectives and actions specified in the management plan are represented as adequate and appropriate responses to the site's issues	n/a
		How is it measured	n/a	n/a	Ordinal scale using: 4. Very Good: Objectives and actions are adequate and appropriate for all issues. 3. Good: Objectives and actions are adequate and appropriate for most issues. 2. Fair: Objectives and actions are frequently inadequate or inappropriate. 1. Poor: Objectives and actions in the plan do not represent an adequate or appropriate response to the primary issues.	n/a
		Sources	-	-	*	-
		Detail	-	-	+	-

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
			n/a	n/a	Local and indigenous communities living in or around the site are involved in developing the management plan and setting direction for the management of the site (Where applicable)	n/a	
			n/a	n/a	Ordinal scale using: 4. Very Good: Local and indigenous communities living in or around the site were meaningfully and fully involved in developing the management plan and setting direction for the site. 3. Good: Local and indigenous communities living in or around the site were partially involved in developing the management plan and setting direction for the site. 2. Fair: Local and indigenous communities living in or around the site were involved only minimally in developing the management plan and setting direction for the site. 1. Poor: Local and indigenous communities living in or around the site were not involved in developing the management plan and setting direction for the site.	n/a	
			-	-	*	-	
			-	-	++	-	
			n/a	n/a	The management plan takes account of needs and interests of local and indigenous communities living in or around the site (Where applicable)	n/a	
			n/a	n/a	Ordinal scale using: 4. Very Good: Plan identifies the needs and interests of local and indigenous communities and has taken these into account in decision-making. 3. Good: Plan identifies the needs and interests of local and indigenous communities, but it is not apparent these have been taken into account in decision-making. 2. Fair: There is limited attention given to the needs and interests of local and indigenous communities and little account taken of these in decision-making. 1. Poor: No apparent attention has been given to the needs and interests of local and indigenous communities.	n/a	
			-	-	*	-	
			-	-	++	-	
Design and planning	Planning	Management planning	Indicator				
			How is it measured				
			Sources				
			Detail				

Theme	Element	Criterion	Indicators			
			METT	RAPPAM	EoH	SCSC
			n/a	n/a	The management plan takes account of needs and interests of the other stakeholders involved in the site	n/a
		Indicator	n/a	n/a	Ordinal scale using: 4. Very Good: Plan identifies the needs and interests of other stakeholders and has taken these into account in decision-making. 3. Good: Plan identifies the needs and interests of other stakeholders, but it is not apparent these have been taken into account in decision-making. 2. Fair: There is limited attention given to the needs and interests of other stakeholders and little account taken of these in decision-making. 1. Poor: No apparent attention has been given to the needs and interests of other stakeholders.	n/a
		How is it measured	n/a	n/a		n/a
		Sources	-	-	*	-
		Detail	-	-	++	-
		Indicator	n/a	n/a	The management plan provides adequate direction on management actions that should be taken in the site	n/a
		How is it measured	n/a	n/a	Ordinal scale using: 4. Very Good: Management actions specified in the plan are clearly understood and provide a useful basis for developing operational plans such as programmes and budgets. 3. Good: Management actions specified in the plan can generally be clearly understood and provide an adequate basis for developing operational plans such as programmes and budgets. 2. Fair: Management actions are sometimes unclear or lacking in specificity making it difficult for developing operational plans such as programmes and budgets. 1. Poor: Management actions are unclear or lacking in specificity making it difficult for developing operational plans such as programmes and budgets.	n/a
		Sources	-	-	*	-
		Detail	-	-	+	-

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
			n/a	n/a	The management plan identifies the priorities amongst strategies and actions in a way that facilitates work programming and allocation of resources	n/a	
		How is it measured	n/a	n/a	Ordinal scale using: 4. Very Good: Clear priorities are indicated within the plan in a way that supports work programming and allocation of resources. 3. Good: Priorities are generally indicated making their use for work programming and resource allocation adequate most of the time. 2. Fair: Priorities are not clearly identified but may be inferred for work programming and resource allocation. 1. Poor: There is no indication of priorities in the plan so that the plan cannot be used for work programming and resource allocation.	n/a	
Design and planning	Management planning	Sources	-	-	*	-	
		Detail	-	-	+	-	
		Indicator	Appropriate regulations in place to control land use and activities	n/a	n/a	n/a	n/a
		How is it measured	Ordinal scale using: 3. Regulations for controlling inappropriate land use and activities in the PA exist and provide an excellent basis for management. 2. Regulations for controlling land use and activities in the PA exist but there are some weaknesses or gaps. 1. Some regulations for controlling land use and activities in the PA exist but there are major weaknesses. 0. There are no regulations for controlling land use and activities in the PA.	n/a	n/a	n/a	n/a
		Sources	*	-	-	-	
		Detail	++	-	-	-	

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Design and planning	Planning	Management planning	Indicator	n/a	n/a	n/a	
			How is it measured	Land and water use planning recognise the PA and aid the achievement of objectives Ordinal scale using: 3. Adjacent land and water use planning fully takes into account the long term needs of the PA. 2. Adjacent land and water use planning partially takes into account the long term needs of the PA. 1. Adjacent land and water use planning does not take into account the long term needs of the PA, but activities are not detrimental for the area. 0. Adjacent land and water use planning does not take into account the needs of the PA and activities / policies are detrimental to the survival of the area. +1 if planning and management in the catchment or landscape containing the PA incorporated provision of adequate environmental conditions to sustain relevant habitats. +1 if management of corridors linking the PA provides for wildlife passage to key habitats outside the PA. +1 if planning addresses ecosystem-specific needs of particular species of concern at an ecosystem scale.	n/a	n/a	n/a
			Sources	*	-	-	-
			Potential	+	-	-	-
			Indicator	n/a	n/a	n/a	NGO self-sufficiency plan (Where applicable)
			How is it measured	n/a	n/a	n/a	Ordinal scale using: 5. NGO fully implementing plan for achieving operational self-sufficiency, results corresponding approximately to goals set. 4. NGO has completed plan for operational self-sufficiency and has begun implementation and monitoring of results. 3. NGO completing plan for operational self-sufficiency. 2. NGO beginning plan for operational self-sufficiency. 1. NGO has no plan for achieving operational self-sufficiency.
			Sources	-	-	-	*
			Detail	-	-	-	++

Theme	Element	Criterion	Indicators			
			METT	RAPPAM	EoH	SCSC
Design and planning	Management planning	Indicator	n/a	n/a	n/a	Site long-term financial plan
		How is it measured	n/a	n/a	n/a	Ordinal scale using: 5. Long-term financial plan completed, diversified portfolio of funding sources and mechanisms in place to cover basic reserve management costs. 4. Long-term financial plan completed, recurrent and/or sustainable sources and mechanisms to cover basic reserve management costs are being implemented. 3. Draft financial plan completed, recurrent and/or sustainable sources and mechanisms identified to cover basic reserve management costs. 2. Financial planning under way. 1. No financial planning or diversification of funding sources in evidence.
	Sources	-	-	-	*	
	Potential	-	-	-	++	
	Indicator	2	8	15	2	
	How is it measured	L=2 M=0 H=0 L=1 M=1 H=0	L=8 M=0 H=0 L=6 M=2 H=0	L=15 M=0 H=0 L=7 M=8 H=0	L=2 M=0 H=0 L=0 M=2 H=0	
	PA design	Indicator	PA is the right size and shape to protect species, habitats, ecological processes and water catchments of key conservation concern	Layout and configuration of the PA optimises the conservation of biodiversity	n/a	n/a
	How is it measured	Ordinal scale using: 3. PA design helps achievement of objectives; it is appropriate for species and habitat conservation; and maintains ecological processes such as surface and groundwater flows at a catchment scale, natural disturbance patterns, etc.. 2. PA design is not significantly constraining achievement of objectives, but could be improved. 1. Inadequacies in PA design mean that the achievement of major objectives is difficult but some mitigating actions are being taken. 0. Inadequacies in PA design mean achieving the major objectives of the PA is very difficult.	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a	
	Sources	*	*	-	-	
	Potential	+	+	-	-	
Indicator	n/a	n/a	Location and nature of boundaries support or impede management	n/a		
How is it measured	n/a	n/a	Nominal scale using: Explain how the location and nature of boundaries support or impede management effectiveness. Include a list of strengths and weaknesses.	n/a		
Sources	-	-	*	-		
Detail	-	-	++	-		

Theme	Element	Criterion	Indicators			
			METT	RAPPAM	EoH	SCSC
Design and planning	Planning	PA design	Indicator	The siting of the PA is consistent with the PA objectives	n/a	n/a
			How is it measured	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	*	-	-
			Detail	+	-	-
			Indicator	The PA zoning system is adequate to achieve the PA objectives	n/a	n/a
			How is it measured	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	*	-	-
			Detail	+	-	-
			Indicator	n/a	n/a	n/a
			How is it measured	n/a	n/a	n/a
			Sources	*	-	-
			Detail	+	-	-
			Indicator	The land in use in the surrounding area enables effective PA management	n/a	n/a
			How is it measured	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	*	-	-
			Detail	+	-	-
			Indicator	The PA is linked to another area of conserved or protected land	n/a	n/a
			How is it measured	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	*	-	-
			Detail	+	-	-
Indicator	n/a	n/a	n/a			
How is it measured	n/a	n/a	n/a			
Sources	*	-	-			
Detail	+	-	-			
Indicator	Design assessment based on ecological integrity	n/a	n/a			
How is it measured	Ordinal scale: List and explain: PA key habitats; Size of habitats and PA, External interactions which impact site's values, Connectivity between site and other suitable habitats. Conduct a strengths and weaknesses analysis of the elements listed and described.	n/a	n/a			
Sources	*	-	-			
Detail	+++	-	-			

Theme	Element	Criterion	Indicators			SCSC	
			METT	RAPPAM	EoH		
Design and planning	PA design	PA design	Indicator	n/a	n/a	n/a	
			How is it measured	n/a	n/a	n/a	
			Sources	-	-	*	
			Detail	-	-	+++	
			Total	1	5	3	
			Sources	L=1 M=0 H=0	L=5 M=0 H=0	L=3 M=0 H=0	
			Detail	L=1 M=0 H=0	L=5 M=0 H=0	L=0 M=1 H=2	
			Indicator	Enough people employed to manage the PA	The level of staffing is sufficient to effectively manage the area	Assessment of staff	Sufficient on-site personnel
			How is it measured	Ordinal scale using: 3. Staff numbers are adequate for the management needs of the PA. 2. Staff numbers are below optimum level for critical management activities. 1. Staff numbers are inadequate for critical management activities. 0. There are no staff.	Ordinal scale using: yes-mostly yes-mostly no- no	Nominal scale: List staff positions (including categories of temporary and permanent staff). Identify where staff are posted. Estimate number of required staff. Number of current staff.	Ordinal scale using: 5. Number of on site personnel sufficient to perform all planned management activities. 4. Number of on site personnel adequate to perform basic management activities. 3. On-site personnel able to perform some management activities. 2. Some on-site personnel, not enough to adequately perform management activities. 1. No on-site personnel.
			Sources	*	*	*	
Detail	+	+	+++				
Adequacy and appropriateness	Staff	Staff	Indicator	Staff adequately trained to fulfil management activities	Staff members have adequate skills to conduct critical management activities	Staff training	
			How is it measured	Ordinal scale using: 3. Staff training and skills are aligned with the management needs of the PA. 2. Staff training and skills area adequate, but could be further improved to fully achieve the objectives of management. 1. Staff training and skills are low relative to the needs of the PA. 0. Staff lack the skills needed for PA.	Ordinal scale using: yes-mostly yes-mostly no- no	Ordinal scale using: 4. Very good: staff training and skills are appropriate for the management needs of the site and for anticipated future needs. 3. Good: staff training and skills are adequate, but could be further improved to fully achieve management objectives. 2. Fair: staff training and skills are low relative to the management needs of the site. 1. Poor: staff lack the skills and training for effective site management.	n/a
			Sources	*	*	*	
			Detail	+	+	+	

Theme	Element	Criterion	Indicators			
			METT	RAPPAM	EoH	SCSC
Adequacy and appropriateness	Staff	Indicator	n/a	Staff employment conditions are sufficient to retain high-quality staff	n/a	n/a
		How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
		Sources	-	*	-	-
		Detail	-	+	-	-
		Total	2	3	2	1
		Sources	L-2 M=0 H=0	L-3 M=0 H=0	L-2 M=0 H=0	L-1 M=0 H=0
		Detail	L-2 M=0 H=0	L-3 M=0 H=0	L-1 M=0 H=1	L-1 M=0 H=0
		Indicator	Current budget sufficient	n/a	Assessment of budget	n/a
		How is it measured	Ordinal scale using: 3. The available budget is sufficient and meets the full management needs of the PA. 2. The available budget is acceptable, but could be further improved to fully achieve effective management. 1. The available budget is inadequate for basic management needs and presents a serious constraint to the capacity to manage. 0. There is no budget for management of the PA.	n/a	Nominal scale: Identify and list expenditure categories, assess budget required for each, actual budget available per category and current funding sources.	n/a
		Sources	*	-	*	-
	Detail	++	-	+++	-	
	Indicator	Security of budget	n/a	n/a	n/a	
	Funding	How is it measured	Ordinal scale using: 3. There is a secure budget for the PA and its management needs. 2. There is a reasonably secure core budget for regular operation of the PA but many innovations and initiatives are reliant on outside funding. 1. There is very little secure budget and the PA could not function adequately without outside funding. 0. There is no secure budget for the PA and management is wholly reliant on outsider or highly variable funding.	n/a	n/a	n/a
		Sources	*	-	-	-
		Detail	++	-	-	-
		Indicator	Funding in the past 5 years has been adequate to conduct critical management activities	n/a	n/a	n/a
		How is it measured	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a	n/a
		Sources	-	*	-	-
		Detail	-	+	-	-
		Indicator	Funding in the next 5 years is adequate to conduct critical management activities	n/a	n/a	n/a
How is it measured		Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a	n/a	
Sources		-	*	-	-	
Detail	-	+	-	-		

Theme	Element	Criterion	Indicators					
			METT	RAPPAM	EoH	SCSC		
Adequacy and appropriateness	Inputs	Funding	Indicator		Financial management practices enable efficient and effective PA management		n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a	n/a
			Sources	-	*	-	-	-
			Detail	-	+	-	-	-
			Indicator	n/a	The allocation of expenditures is appropriate to PA priorities and objectives	n/a	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a	n/a
			Sources	-	*	-	-	-
			Detail	-	+	-	-	-
			Indicator	n/a	The long-term financial outlook for the PA is stable	n/a	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a	n/a
	Sources	-	*	-	-	-		
	Detail	-	+	-	-	-		
	Total	2	5	1	0			
	Sources	L=2 M=0 H=0	L=5 M=0 H=0	L=1 M=0 H=0	L=0 M=0 H=0			
	Detail	L=0 M=2 H=0	L=5 M=0 H=0	L=0 M=0 H=1	L=0 M=0 H=0			
	Indicator	Equipment and facilities sufficient for management needs	n/a	n/a	n/a	n/a		
	How is it measured	Ordinal scale using: 3. There are adequate equipment and facilities. 2. There are equipment and facilities but still some gaps that constrain management. 1. There are some equipment and facilities but these are inadequate for most management needs. 0. There are little or no equipment and facilities for management needs.	n/a	n/a	n/a	n/a		
Sources	*	-	-	-	-			
Detail	+	-	-	-	-			
Indicator	n/a	Staff facilities are adequate to perform critical management activities	Staff equipment and facilities (e.g. Vehicles, GPS, accommodation, etc.)	n/a	n/a			
How is it measured	n/a	Ordinal scale using: 4. Very good: Staff facilities and equipment are good and aid the achievement of the objectives of the site. 3. Good: Staff facilities and equipment are not significantly constraining achievement of major objectives. 2. Fair: Inadequate staff facilities and equipment constrain achievement of some management objectives. 1. Poor: Inadequate staff facilities and equipment mean that achievement of major objectives is constrained.	n/a	n/a	n/a			
Sources	-	*	*	-	-			
Detail	-	+	+	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Inputs	Equipment and facilities	Indicator	Transportation infrastructure is adequate to perform critical management activities.	n/a	n/a	n/a
			How is it measured	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a	n/a
			Sources	*	-	-	-
			Detail	+	-	-	-
			Indicator	Field equipment is adequate to perform critical management activities	n/a	n/a	n/a
			How is it measured	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a	n/a
			Sources	*	-	-	-
			Detail	+	-	-	-
			Indicator	n/a	n/a	Adequacy of major infrastructure (e.g. Roads, offices, fire towers, etc.)	Physical infrastructure (As defined, e.g. Ranger stations, vehicles, boundary demarcation, education-management related signs, roads, trails, etc.)
			How is it measured	n/a	n/a	Ordinal scale using: 4. Very good: Management infrastructure is excellent and appropriate for managing the site. 3. Good: Management infrastructure is adequate and generally appropriate for the site. 2. Fair: Management infrastructure is often inadequate and/or inappropriate for the site. 1. Poor: Management infrastructure is inadequate and/or inappropriate for the site.	Ordinal scale using: 5. All physical infrastructure necessary for basic reserve management in place. 4. Most physical infrastructure necessary for basic reserve management in place. 3. Some physical infrastructure necessary for basic reserve management in place, but significant gaps exist. 2. Little physical infrastructure for basic reserve management in place. 1. No physical infrastructure for reserve management in place.
			Sources	-	-	*	*
			Detail	-	-	++	+
			Total	1	3	2	1
			Sources	L=1 M=0 H=0	L=3 M=0 H=0	L=2 M=0 H=0	L=1 M=0 H=0
			Detail	L=1 M=0 H=0	L=3 M=0 H=0	L=1 M=1 H=0	L=1 M=0 H=0
Indicator	n/a	Existing ecological and socio-economic data are adequate for management planning	n/a	n/a			
How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a			
Sources	-	*	-	-			
Detail	-	+	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Inputs	Information	Indicator	Resource inventory	Comprehensive inventory of natural and cultural resources	Resource inventory	n/a
			How is it measured	Ordinal scale using: 3. Information on the critical habitats, species, ecological processes and cultural values of the PA is sufficient to support all areas of planning and decision making. 2. Information on the critical habitats, species, ecological processes and cultural values of the PA is sufficient for most key areas of planning and decision making. 1. Information on the critical habitats, species, ecological processes and cultural values of the PA is not sufficient to support planning and decision making. 0. There is little or no information available on the critical habitats, species and cultural values of the PA.	Ordinal scale using: yes-mostly yes-mostly no- no	Ordinal scale using: 4. Very good: Information on the critical habitats, species and cultural values of the site is sufficient to support planning and decision making and is being updated. 3. Good: Information on the critical habitats, species and cultural values of the site is sufficient for some areas of planning / decision making and plans exist to fill data gaps. 2. Fair: Some information is available on the critical habitats, species and cultural values of the site, but it is insufficient to support planning and decision making and further data gathering is not being carried out. 1. Poor: There is little or no information available on the critical habitats, species and cultural values of the PA.	n/a
			Sources	*	*	*	-
			Detail	+	+	+	-
			Indicator	n/a	Adequate means for collecting new data	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	Adequate systems for processing and analysing data	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Total	1	4	1	0
			Sources	L=1 M=0 H=0	L=4 M=0 H=0	L=1 M=0 H=0	L=0 M=0 H=0
			Detail	L=1 M=0 H=0	L=4 M=0 H=0	L=1 M=0 H=0	L=0 M=0 H=0

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Processes	Administration, work programming and internal organisation	Indicator	Existence and implementation of management plan	n/a	Approved and implemented management plan	Site-based long term management plan
			How is it measured	<p>Ordinal scale using:</p> <p>3. Management plan exists and is being implemented.</p> <p>2. Management plan exists but it is only being partially implemented because of funding constraints or other problems.</p> <p>1. Management plan is being prepared but is not being implemented.</p> <p>0. There is no management plan for the PA.</p> <p>+1. If planning process allows adequate opportunity for key stakeholders to influence management plan.</p> <p>+1. If an established process and schedule for periodic review and updating of the plan exists.</p> <p>+1. If the results of monitoring, research and evaluation are routinely incorporated into planning.</p>	n/a	<p>Ordinal scale using:</p> <p>4. Very good: Approved management plan exists and is being fully implemented.</p> <p>3. Good: Approved management plan exists but it is only being partially implemented because of funding constraints and other problems.</p> <p>2. Fair: A plan is being prepared or has been prepared but is not being implemented.</p> <p>1. Poor: There is no plan for managing the site.</p>	<p>Ordinal scale using:</p> <p>5. Long term management plan that takes into account off-site threats completed, guiding reserve management.</p> <p>4. Long term management plan completed, guiding reserve management.</p> <p>3. Long term management plan completed but not yet implemented.</p> <p>2. Long term management plan preparation in progress.</p> <p>1. Long term management plan not yet begun.</p>
			Sources	*	-	*	*
			Detail	++	-	++	++
			Indicator	Management undertaken according to agreed objectives	n/a	n/a	n/a
			How is it measured	<p>Ordinal scale using:</p> <p>3. The PA has agreed objectives and is managed to meet the objectives.</p> <p>2. The PA has agreed objectives, but is only partially managed according to these objectives.</p> <p>1. The PA has agreed objectives, but is not managed according to these objectives.</p> <p>0. No firm objectives have been agreed for the PA.</p>	n/a	n/a	n/a
			Sources	*	-	-	-
			Detail	++	-	-	-
			Indicator	n/a	n/a	Site values identified and linked to management objectives	n/a
			How is it measured	n/a	n/a	<p>Ordinal scale using:</p> <p>4. Very good: Site has agreed and documented values and the management objectives fully reflect them.</p> <p>3. Good: Site has agreed and documented values, but these are only partially reflected in the management objectives.</p> <p>2. Fair: Site has agreed and documented values, but these are not reflected in management objectives.</p> <p>1. Poor: No values have been agreed for the site.</p>	n/a
Sources	-	-	*	-			
Detail	-	-	++	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Processes	Administration, work programming and internal organisation	Indicator	n/a	n/a	n/a	Broad-based management committee / technical advisory committee (Where applicable)
			How is it measured	n/a	n/a	n/a	Ordinal scale using: 5. Advisory committee an active participant in reserve management decisions. 4. Advisory committee includes key stakeholders, occasionally participates in reserve management decisions. 3. Key stakeholders identified, advisory committee framed. 2. Advisory committee being formed, analysis of stakeholders in reserve underway. 1. Advisory committee non-existent.
			Sources	-	-	-	*
			Detail	-	-	-	+
			Indicator	Existence and implementation of regular work plan	n/a	Regular work plan	n/a
			How is it measured	Ordinal scale using: 3. Regular work plan exists and all activities are implemented. 2. Regular work plan exists and many activities are implemented. 1. Regular work plan exists but few of the activities are implemented. 0. No regular plan work exists.	n/a	n/a	n/a
			Sources	*	-	*	-
			Detail	++	-	++	-
			Indicator	n/a	n/a	Planning systems	n/a
			How is it measured	n/a	n/a	Ordinal scale using: 4. Very good: Planning and decision making processes are excellent. 3. Good: There are some planning and decision making processes in place, but they could be better, either in terms of improved processes or processes being carried out. 2. Fair: There are some planning and decision making processes in place, but these are either inadequate or are not carried out. 1. Poor: Planning and decision making processes are deficient in most aspects.	n/a
Sources	-	-	*	-			
Detail	-	-	+	-			

Theme	Element	Criterion	Indicators				SCSC
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Processes	Administration, work programming and internal organisation	Indicator	Budget managed to meet critical management needs	n/a	Financial management systems meet critical management needs	n/a
			How is it measured	Ordinal scale using: 3. Budget management is excellent and meets management needs. 2. Budget management is adequate but could be improved. 1. Budget management is poor and constrains effectiveness. 0. Budget management is very poor and constrains effectiveness.	n/a	Ordinal scale using: 4. Very good: Financial management is excellent and contributes to effective management of the site. 3. Good: Financial management is adequate but could be improved. 2. Fair: Financial management is poor and constrains effectiveness. 1. Poor: Financial management is poor and significantly undermines effectiveness of the site.	n/a
			Sources	*	-	*	-
			Detail	+	-	+	-
			Indicator	Fees applied help PA management	n/a	n/a	n/a
			How is it measured	Ordinal scale using: 3. Fees are collected and make substantial contribution to the PA and it environs. 2. Fees are collected and make some contribution to the PA and it environs. 1. Fees are collected but make no contribution to the PA or it environs. 0. Although fees are theoretically applied, they are not collected.	n/a	n/a	n/a
			Sources	*	-	-	-
			Detail	++	-	-	-
			Indicator	n/a	Clear internal organisation	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	Management decision making is transparent	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	There are adequate means of communication between field and office staff	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
Indicator	n/a	Effective communication between all levels of PA staff and administration	n/a	n/a			
How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a			
Sources	-	*	-	-			
Detail	-	+	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Administration, work programming and internal organisation	Indicator	n/a	n/a	Staff have the opportunity to feed into management decisions	n/a	
			How is it measured	n/a	n/a	Ordinal scale using: 4. Very good: Staff directly participate in making decisions relating to management of the site at both site and management authority level. 3. Good: Staff directly participate in some decisions relating to management. 2. Fair: Staff have some input into discussions relating to management, but no direct involvement in the resulting decisions. 1. Poor: There are no mechanisms for staff to input into decisions relating to the management of the site.	n/a
	Processes	Administration, work programming and internal organisation	Sources	-	-	*	-
			Detail	-	-	++	-
			Total	5	3	6	2
			Sources	L=5 M=0 H=0	L=3 M=0 H=0	L=6 M=0 H=0	L=2 M=0 H=0
	Evaluation	Indicator	Management activities monitored against performance	n/a	n/a	Management activities monitored against performance	n/a
			How is it measured	Management activities monitored against performance	n/a	Management activities monitored against performance	n/a
	Processes	Evaluation	Indicator	Management activities monitored against performance	n/a	Management activities monitored against performance	n/a
				How is it measured	Management activities monitored against performance	n/a	Management activities monitored against performance
Sources				*	-	*	-
Detail				++	-	++	-

Theme	Element	Criterion	Indicators			
			METT	RAPPAM	EoH	SCSC
		Indicator	n/a	n/a	Reporting requirements of the site fulfilled	n/a
		How is it measured	n/a	n/a	Ordinal scale using: 4. Very good: Site managers fully comply with all reporting needs and have all the necessary information for full and informative reporting. 3. Good: Site managers fully comply with all reporting needs, but do not have all the necessary information for full and informative reporting. 2. Fair: There is some reporting but all reporting needs are not fulfilled and managers do not have all the necessary on the site to allow full and informative reporting. 1. Poor: There is no reporting on the site.	n/a
		Sources	-	-	*	-
		Detail	-	-	++	-
		Indicator			Assessment of management plan implementation	
		How is it measured			Nominal scale: List of components in management plan. And evaluation using an ordinal scale: 1. Not commenced 2. Reactive work only 3. Planning in progress 4. Planning complete work commenced 5. Substantial progress 6. Action completed	
		Sources			*	
		Detail			+	
		Indicator	n/a		Staff performance and progress on targets are periodically reviewed	n/a
		How is it measured	n/a		Ordinal scale using: yes-mostly yes-mostly no- no	n/a
		Sources	-	*	-	-
		Detail	-	+		
		Total	1	1	3	0
		Sources	L=1 M=0 H=0	L=1 M=0 H=0	L=3 M=0 H=0	L=0 M=0 H=0
		Detail	L=0 M=1 H=0	L=1 M=0 H=0	L=2 M=1 H=0	L=0 M=0 H=0

Theme	Element	Criterion	Indicators				SCSC
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Processes	Maintenance of infrastructure, facilities and equipment	Indicator	Maintenance of equipment	Maintenance and care of equipment is adequate to ensure long-term use	Maintenance of equipment	n/a
			How is it measured	Ordinal scale using: 3. Equipment and facilities are well maintained. 2. There is basic maintenance of equipment and facilities. 1. There is some ad hoc maintenance of equipment and facilities. 0. There is little or no maintenance of equipment and facilities.	Ordinal scale using: 4. Very good: Equipment and facilities are well-maintained and an equipment maintenance plan is being implemented. 3. Good: There is basic maintenance of equipment and facilities. If a maintenance plan exists it is not fully implemented. 2. Fair: There is some ad hoc maintenance, but maintenance plan does not exist or is not implemented. 1. Poor: There is little or no maintenance of equipment and facilities and no maintenance plan.	Ordinal scale using: 4. Very good: Equipment and facilities are well-maintained and an equipment maintenance plan is being implemented. 3. Good: There is basic maintenance of equipment and facilities. If a maintenance plan exists it is not fully implemented. 2. Fair: There is some ad hoc maintenance, but maintenance plan does not exist or is not implemented. 1. Poor: There is little or no maintenance of equipment and facilities and no maintenance plan.	n/a
			Sources	*	*	*	-
			Detail	+	+	++	-
			Total	1	1	1	0
			Sources	L=1 M=0 H=0	L=1 M=0 H=0	L=1 M=0 H=0	L=0 M=0 H=0
			Detail	L=1 M=0 H=0	L=1 M=0 H=0	L=0 M=1 H=0	L=0 M=0 H=0
			Indicator	n/a	n/a	Assessment of staff training	Staff training
			How is it measured	n/a	n/a	Nominal scale: Identify proportions of staff who are trained and specify categories of training. Detail type of training required. Ordinal scale using: 4. Very good: more than 75% of staff is trained to an adequate level to carry out the activities required. 3. Good: 50% - 75% of staff is trained to an adequate level to carry out the activities required. 2. Fair: 25% - 50% of staff is trained to an adequate level to carry out the activities required. 1. Poor: less than 25% of staff is trained to an adequate level to carry out the activities required.	Ordinal scale using: 5. Training needs identified, systematic training program begun. 4. Training needs identified, some basic courses provided. 3. Training needs identified, no training yet initiated. 2. Training needs being identified. 1. No indication of personnel training needs.
			Sources	-	-	*	*
	Detail	-	-	++	++		
	Indicator	n/a	Training and development opportunities are appropriate to the needs of the staff	n/a	n/a		
	How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a		
	Sources	-	*	-	-		
	Detail	-	+	-	-		
Total	0	1	1	1			
Sources	L=0 M=0 H=0	L=1 M=0 H=0	L=1 M=0 H=0	L=1 M=0 H=0			
Detail	L=0 M=0 H=0	L=1 M=0 H=0	L=0 M=1 H=0	L=0 M=1 H=0			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Human resource management	Human resource management	Indicator	n/a	n/a	Personnel management	n/a
			How is it measured	n/a	n/a	Ordinal scale using: 4. Very good: Provisions (job descriptions, staff appraisals, grievance procedures, promotion plans, insurance) to ensure good personnel management are in place. 3. Good: Although some provisions for personnel management are in place, these could be improved. 2. Fair: There are minimal provisions for good personal management. 1. Poor: There are no provisions to ensure good personnel management.	n/a
			Sources	-	-	*	-
			Detail	-	-	+	-
			Total	0	0	1	0
			Sources	L=0 M=0 H=0	L=0 M=0 H=0	L=1 M=0 H=0	L=0 M=0 H=0
			Detail	L=0 M=0 H=0	L=0 M=0 H=0	L=1 M=0 H=0	L=0 M=0 H=0
			Indicator	Staff can enforce PA rules and laws	Staff and financial resources are adequate to conduct critical law enforcement activities.	Capacity to enforce legislation	n/a
			How is it measured	Ordinal scale using: 3. Staff have excellent capacity/resources to enforce PA legislation and regulation. 2. Staff have acceptable capacity/resources to enforce PA legislation and regulations but some deficiencies remain. 1. There are major deficiencies in staff capacity/resources to enforce PA legislation and regulations (e.g. lack of skills, no patrol budget, lack of institutional support). 0. Staff have no effective capacity/resources to enforce PA legislation and regulations.	Ordinal scale using: yes-mostly yes-mostly no- no	Ordinal scale using: 4. Very good: The staff have excellent capacity/resources to enforce legislation and regulations. 3. Good: The staff have acceptable capacity/resources to enforce legislation and regulations, but some deficiencies remain. 2. Fair: There are major deficiencies in staff capacity/resources to enforce legislation and regulations. 1. Poor: The staff have no effective capacity/resources to enforce legislation and regulations.	n/a
			Sources	*	*	*	-
	Detail	+	+	+	-		
	Indicator	n/a	n/a	Lack of control over access points to the site impact on management effectiveness	n/a		
	How is it measured	n/a	n/a	Nominal scale using: Explain how the lack of control over access points affects management effectiveness. Include a list of strengths and weaknesses.	n/a		
	Sources	-	-	*	-		
	Detail	-	-	++	-		
Indicator	n/a	Illegal activities within PA are difficult to monitor	n/a	n/a			
How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a			
Sources	-	*	-	-			
Detail	-	+	-	-			

Theme	Element	Criterion	Indicators				SCSC
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Processes	Community involvement	Total	1	2	2	0
			Sources	L=1 M=0 H=0	L=2 M=0 H=0	L=2 M=0 H=0	L=0 M=0 H=0
			Detail	L=1 M=0 H=0	L=2 M=0 H=0	L=1 M=1 H=0	L=0 M=0 H=0
			Indicator	-	Staff regularly collaborate with partners, local communities and other organisations	-	-
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	Effective communication with local communities	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	Local communities participate in decisions that affect them	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	Local communities resident or near the PA have input into management decisions	Local communities resident or near the PA have input into management decisions	n/a	n/a
			How is it measured	Ordinal scale using: 3. Local communities directly participate in all relevant decisions relating to management (co-management). 2. Local communities contribute to some relevant decisions relating to management but their involvement could be improved. 1. Local communities have some input into discussions relating to management but no direct role in management. 0. Local communities have no input into decisions relating to management of the PA. +1. If there is open communication and trust between local and indigenous people, stakeholders and PA managers. +1. If programmes to enhance community welfare, while conserving PA resources are being implemented. +1. If local and/or indigenous people actively support the PA.	Ordinal scale using: 4. Very good: Local communities directly and meaningfully participate in all relevant management decisions for the site. 3. Good: Local communities directly contribute to some relevant management decisions, but their involvement could be improved. 2. Fair: Local communities have some input into discussions relating to management, but no direct involvement in decision making. 1. Poor: Local communities have no input into decisions relating to the management of the site.	n/a	n/a
Sources	*	-	*	-			
Detail	+	-	+	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Processes	Community involvement	Indicator	Indigenous and traditional peoples resident or regularly using the PA have input into management decisions	n/a	Indigenous and traditional peoples resident or regularly using the PA have input into management decisions	n/a
			How is it measured	Ordinal scale using: 3. Indigenous and traditional peoples directly participate in all relevant decisions relating to management (co-management). 2. Indigenous and traditional peoples contribute to some relevant decisions relating to management but their involvement could be improved. 1. Indigenous and traditional peoples have some input into discussions relating to management but no direct role in management. 0. Indigenous and traditional peoples have no input into decisions relating to management of the PA.	n/a	Ordinal scale using: 4. Very good: Indigenous and traditional peoples directly participate in all relevant management decisions for the site. 3. Good: Indigenous and traditional peoples directly contribute to making some relevant management decisions, but their involvement could be improved. 2. Fair: Indigenous and traditional peoples have some input into discussions relating to management, but no direct involvement in decision making. 1. Poor: Indigenous and traditional peoples have no input into decisions relating to the management of the site.	n/a
			Sources	*	-	*	-
			Detail	+	-	+	-
			Indicator	n/a	n/a	Actual engagement of stakeholders in the management of specific site values	n/a
			How is it measured	n/a	n/a	Nominal scale: E.g. List of stakeholders, what is their level of engagement in management, based on its nature and extent and how regularly are they consulted.	n/a
			Sources	-	-	*	-
			Detail	-	-	++	-
			Indicator	n/a	n/a	Stakeholders' receptivity to participating in management of site values	n/a
			How is it measured	n/a	n/a	Nominal scale: Description of the willingness & capacity (including resources) of stakeholders to engage with site management and under what conditions is it done.	n/a
			Sources	-	-	*	-
			Detail	-	-	++	-
			Indicator	n/a	n/a	Level of stakeholders' organisation to participate in management	n/a
			How is it measured	n/a	n/a	Nominal scale: Description of how and what degree of stakeholders' organisation exists to engage with efficient and effective management. Include a list of specific community institutions that facilitate engagement.	n/a
			Sources	-	-	*	-
Detail	-	-	++	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Processes	Community involvement	Indicator	Cooperation with adjacent land and water users	n/a	Cooperation with adjacent land / sea owners and users	n/a
			How is it measured	Ordinal scale using: 3. There is regular contact between managers and neighbouring official or corporate land and water users, and substantial co-operation on management. 2. There is contact between managers and neighbouring official or corporate land and water users, but only some co-operation. 1. There is contact between managers and neighbouring official or corporate land and water users, but little or no co-operation. 0. There is no contact between managers and neighbouring official or corporate land and water users.	n/a	Ordinal scale using: 4. Very good: There is regular contact between managers and neighbouring official or corporate land / sea users, and substantial co-operation on management. 3. Good: There is contact between managers and neighbouring official or corporate land / sea users, but only some co-operation on management. 2. Fair: There is contact between managers and neighbouring official or corporate land / sea users, but little or no co-operation. 1. Poor: There is no contact between managers and neighbouring official or corporate land / sea users.	n/a
			Sources	*	-	*	-
			Detail	++	-	++	-
			Indicator	n/a	Conflicts with local community are resolved fairly and effectively	Conflicts resolution mechanisms in place to find solutions to site - stakeholders conflicts	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	Ordinal scale using: 4. Very good: Conflict resolutions exist and are used whenever conflicts arise. 3. Good: Conflict resolutions exist, but are only partially effective. 2. Fair: Conflict resolutions exist, but are largely ineffective. 1. Poor: No conflict resolutions mechanisms exist.	n/a
			Sources	-	*	*	-
			Detail	-	+	++	-
			Indicator	n/a	n/a	Nature and extent to which stakeholders contribute to decision-making in relation to site values	n/a
			How is it measured	n/a	n/a	Nominal scale: Description of the opportunities stakeholders have to contribute to management. Include a description of formal and informal management agreements.	n/a
Sources	-	-	*	-			
Detail	-	-	++	-			

Theme	Element	Criterion	Indicators			SCSC	
			METT	RAPPAM	EoH		
Adequacy and appropriateness	Community involvement	Indicator	n/a	n/a	n/a	Community involvement in compatible use of resources	
		How is it measured	n/a	n/a	n/a	Ordinal scale using: 5. Well-documented pilot projects for compatible resource use undertaken in cooperation with community organisations. 4. Well-documented pilot projects for compatible resource use involve communities. 3. Pilot projects for compatible resource use involve communities or residents, documentation under way. 2. Pilot projects for compatible resource use underway but don't involve communities. 1. No pilot projects for compatible resource use under way.	
		Sources	-	-	-	*	
	Processes	Community involvement	Detail	-	-	-	+
			Total	3	4	8	1
			Sources	L=3 M=0 H=0	L=4 M=0 H=0	L=8 M=0 H=0	L=1 M=0 H=0
	Communication education and interpretation	Communication education and interpretation	Detail	L=2 M=1 H=0	L=4 M=0 H=0	L=2 M=6 H=0	L=1 M=0 H=0
			Indicator	Planned education programme linked to objectives and needs	n/a	Planned education programme that addresses all audiences	Site has a well-established environmental education program
			How is it measured	Ordinal scale using: 3. There is an appropriate and fully implemented education and awareness programme. 2. There is an education and awareness programme but it only partly meets needs and could be improved. 1. There is a limited and ad hoc education and awareness programme. 0. There is no education and awareness programme.	n/a	Ordinal scale using: 4. Very good: There is a planned, implemented, and effective education and awareness programme fully linked to the objectives and needs of the site. 3. Good: There is a planned education and awareness programme, but there are still serious gaps either in the plan or in implementation. 2. Fair: There is a limited ad hoc education and awareness programme, but no overall planning. 1. Poor: There is no education and awareness programme.	Ordinal scale using: 5. Measurable positive impact of environmental education programs. 4. Environmental education programs well-established but formal assessment of impact not completed. 3. Environmental education programs being conducted. 2. Environmental education programs being developed. 1. No environmental education programs under development.
	Communication education and interpretation	Communication education and interpretation	Sources	*	-	*	*
Detail			++	-	++	++	
Total			1	0	1	1	
Communication education and interpretation	Communication education and interpretation	Sources	L=1 M=0 H=0	L=0 M=0 H=0	L=1 M=0 H=0	L=1 M=0 H=0	
		Detail	L=0 M=1 H=0	L=0 M=0 H=0	L=0 M=1 H=0	L=0 M=1 H=0	

Theme	Element	Criterion	Indicators				SCSC
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Community development assistance	Indicator	n/a	n/a	Programmes developed by the site managers that consider local people welfare whilst conserving the sites resources	n/a	
		How is it measured	n/a	n/a	Ordinal scale using: 4. Very good: Programmes to enhance local, indigenous and/or traditional peoples' welfare, while conserving site resources are being implemented successfully. 3. Good: Programmes to enhance local, indigenous and/or traditional peoples' welfare, while conserving site resources are being implemented, but could be improved. 2. Fair: Programmes exist to enhance local, indigenous and/or traditional peoples' welfare while conserving site resources, but are either inadequate or are not being implemented. 1. Poor: There are no programmes in place which aim to enhance local, indigenous and/or traditional peoples welfare.	n/a	
	Processes	Sustainable resource management and audit	Sources	-	-	*	-
			Detail	-	-	+	-
			Total	0	0	1	0
			Sources	L=0 M=0 H=0	L=0 M=0 H=0	L=1 M=0 H=0	L=0 M=0 H=0
	Sustainable resource management and audit	Sustainable resource management and audit	Detail	L=0 M=0 H=0	L=0 M=0 H=0	L=1 M=0 H=0	L=0 M=0 H=0
			Indicator	Systems in place to control access/resource use in the PA	n/a	n/a	n/a
			How is it measured	Ordinal scale using: 3. Protection systems (patrols, permits, etc.) are largely or wholly effective in controlling access/resource use. 2. Protection systems are moderately effective in controlling access/resource use. 1. Protection systems are only partially effective in controlling access/resource use. 0. Protection systems do not exist or are not effective in controlling access/resource use.	n/a	n/a	n/a
			Sources	*	-	-	-
Sustainable resource management and audit	Sustainable resource management and audit	Detail	+	-	-	-	
		Total	1	0	0	0	
		Sources	L=1 M=0 H=0	L=0 M=0 H=0	L=0 M=0 H=0	L=0 M=0 H=0	
		Detail	L=1 M=0 H=0	L=0 M=0 H=0	L=0 M=0 H=0	L=0 M=0 H=0	

Theme	Element	Criterion	Indicators				SCSC	
			METT	RAPPAM	EoH	SCSC		
Adequacy and appropriateness	Processes	Visitor management	Indicator	Adequacy of visitor facilities	Visitor facilities are appropriate for the level of visitor use	Visitor facilities	n/a	
			How is it measured	Ordinal scale using: 3. Visitor facilities and services are excellent for current levels of visitation. 2. Visitor facilities and services are adequate for current levels of visitation, but could be improved. 1. Visitor facilities and services are inappropriate for current levels of visitation. 0. There are no visitor facilities and services despite an identified need.	Ordinal scale using: 4. Very good: Visitor facilities and services are excellent for current visitation levels. 3. Good: Visitor facilities and services are adequate for current levels of visitation, but could be improved. 2. Fair: Visitor facilities and services are inappropriate for current visitation levels. 1. Poor: There are no visitor facilities and services despite an identified need.		n/a	
			Sources	**	**	**	-	
			Detail	+	+	+	-	
			Indicator	Commercial tour operators contribute to PA management	n/a	Commercial tour operators contribute to PA management	n/a	
			How is it measured	Ordinal scale using: 3. There is good co-operation between managers and tourism operators to enhance visitor experiences and maintain PA values. 2. There is limited co-operation between managers and tourism operators to enhance visitor experiences and maintain PA values. 1. There is contact between managers and tourism operators but this is largely confined to administrative or regulatory matters. 0. There is little or no contact between managers and tourism operators using the PA.	n/a	Ordinal scale using: 4. Very good: There is good cooperation between managers and tourism operators to enhance visitor experiences and protect site values. 3. Good: There is limited cooperation between managers and tourism operators to enhance visitor experiences and protect site values. 2. Fair: There is contact between managers and tourism operators but this is largely confined to administrative or regulatory matters. 1. Poor: There is little or no contact between managers and tourism operators using the site.		n/a
			Sources	*	-	*	-	
			Detail	++	-	++	-	
			Indicator	n/a	n/a	Plans developed to provide visitors with the most appropriate access and diversity of experience when visiting the site	n/a	
			How is it measured	n/a	n/a	Ordinal scale using: 4. Very good: Implementation of visitor policies and programmes is based on research and monitoring into visitor use and requirements and the carrying capacity of the site. 3. Good: Policies and programmes is to enhance visitor opportunities are being implemented, but these are not based on research and monitoring of visitor use and requirements. 2. Fair: Consideration has been given to policies and programmes to enhance visitor opportunities, but little or no action has been taken. 1. Poor: No consideration has been given to the provision of visitor opportunities to the site.		n/a
Sources	-	-	*	-				
Detail	-	-	++	-				

Theme	Element	Criterion	Indicators					
			METT	RAPPAM	EoH	SCSC		
Adequacy and appropriateness	Visitor management	Visitor management	Indicator	n/a	n/a	Visitor access sufficiently controlled	n/a	
			How is it measured	n/a	n/a	Ordinal scale using: 4. Very good: Visitor management systems are largely or wholly effective in controlling access to the site in accordance with objectives. 3. Good: Visitor management systems are moderately effective in controlling access to the site in accordance with objectives. 2. Fair: Visitor management systems are only partially effective in controlling access to the site in accordance with objectives. 1. Poor: Visitor management systems are ineffective in controlling access to the site in accordance with objectives.	n/a	
			Sources	-	-	**	-	
			Detail	-	-	+	-	
	Processes	Visitor management	Visitor management	Total	2	1	4	0
				Sources	L=1 M=1 H=0	L=0 M=1 H=0	L=2 M=2 H=0	L=0 M=0 H=0
				Detail	L=1 M=1 H=0	L=1 M=0 H=0	L=2 M=2 H=0	L=0 M=0 H=0
				Indicator	Active resource management beign undertaken	n/a	n/a	n/a
	Resource protection and threat reduction	Resource protection and threat reduction	Resource protection and threat reduction	Indicator	Active resource management beign undertaken	n/a	n/a	n/a
				How is it measured	Ordinal scale using: 3. Requirements for active resource management of critical habitats, species, ecological processes and cultural values are being substantially or fully implemented. 2. Many of the requirements for active resource management of critical habitats, species, ecological processes and cultural values are being implemented, but some key issues are not being addressed. 1. Very few of the requirements for active resource management of critical habitats, species, ecological processes and cultural values are being implemented. 0. Active resource management is not being undertaken.	n/a	n/a	n/a
Sources				*	-	-	-	
Detail				+	-	-	-	

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Processes	Resource protection and threat reduction	Indicator	n/a	n/a	Biodiversity adequately managed	n/a
			How is it measured	n/a	n/a	Ordinal scale using: 4. Very good: Requirements for management of critical ecosystems and species are being substantially or fully implemented. 3. Good: Requirements for management of critical ecosystems and species are only being partially implemented. 2. Fair: Requirements for management of critical ecosystems and species are known, but are not being implemented. 1. Poor: Requirements for management of critical ecosystems have not been assessed and/or active management is not being undertaken.	n/a
			Resources Detail	-	-	*	-
			Indicator	n/a	n/a	Site's cultural resources adequately managed	n/a
			How is it measured	n/a	n/a	Ordinal scale using: 4. Very good: Requirements for management of cultural/historical values are being substantially or fully implemented. 3. Good: Requirements for management of cultural/historical values are only being partially implemented. 2. Fair: Requirements for management of cultural/historical values are known, but are not being implemented. 1. Poor: Requirements for management of cultural/historical values have not been assessed and/or active management is not being undertaken.	n/a
			Resources Detail	-	-	*	-
			Indicator	n/a	n/a	Management mechanisms in place to control inappropriate land uses and activities	n/a
			How is it measured	n/a	n/a	Ordinal scale using: 4. Very good: Mechanisms for controlling inappropriate land use and activities in the site exist and are being effectively implemented. 3. Good: Mechanisms for controlling inappropriate land use and activities in the site exist, but there are some problems in effectively implementing them. 2. Fair: Mechanisms for controlling inappropriate land use and activities in the site exist, but there are major problems in implementing them effectively. 1. Poor: There are no management mechanisms for controlling appropriate land use and activities in the site.	n/a
			Sources Detail	-	-	*	-
							++

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EOH	SCSC	
Adequacy and appropriateness	Processes	Resource protection and threat reduction	Total	1	0	3	0
			Sources	L=1 M=0 H=0	L=0 M=0 H=0	L=3 M=0 H=0	L=0 M=0 H=0
			Detail	L=1 M=0 H=0	L=0 M=0 H=0	L=2 M=1 H=0	L=0 M=0 H=0
			Indicator	n/a	n/a	n/a	Monitoring plan development and implementation
			How is it measured	n/a	n/a	n/a	Ordinal scale using: 5. Timely monitoring information and analysis in site manager's hands, being used for management purposes. 4. Monitoring plan completed, accurate, threat related monitoring variables being monitored. 3. Accurate, threat-related monitoring variables identified, baseline information being collected and classified. 2. Some baseline information being gathered, but with no clear relation to principal threats. 1. No environmental monitoring of any significance being carried out.
			Sources	-	-	-	*
			Detail	-	-	-	++
			Indicator	n/a	n/a	n/a	Science and information needs assessment
			How is it measured	n/a	n/a	n/a	Ordinal scale using: 5. Scientific/research organisations and individuals are coordinating with reserve management to address reserve's scientific/information needs. 4. Conservation targets and science/information needs identified, ranked, and distributed, contact made with scientific/research organisations to address these needs. 3. Conservation targets and science/information needs being identified and ranked. 2. Conservation targets and science/information needs generally known. 1. Conservation targets and science/information needs essentially unknown.
			Sources	-	-	-	*
Detail	-	-	-	++			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Processes	Research and monitoring	Indicator	n/a	n/a	Monitoring management outcomes	n/a
			How is it measured	n/a	n/a	Nominal scale: Development of list of indicators to measure major site values or objectives. Definition of indicator thresholds, List management responses if threshold is exceeded, Monitoring activity or method (summary of how information will be collected e.g. survey, equipment, etc.). Clarify if activity is current or new, frequency, timing, people responsible, cost and funding source.	n/a
			Sources	-	-	Ordinal scale using: Level of confidence of threshold: Low-medium-high	-
			Detail	-	-	*	-
			Indicator	Programme of management orientated survey and research work	n/a	Programme of management orientated survey and research work	n/a
			How is it measured	Ordinal scale using: 3. There is a comprehensive, integrated programme of survey and research work, which is relevant to management needs. 2. There is a considerable survey and research work but it is not directed towards the needs of the PA management. 1. There is a small amount of survey and research work but it is not directed towards the needs of the PA management. 0. There is no survey and research work taking place in the PA.	n/a	Ordinal scale using: 4. Very good: There is a comprehensive, integrated programme of survey and research work, which is relevant to management needs. 3. Good: There is a considerable survey and research work but it is not directed towards the needs of the site management. 2. Fair: There is limited survey and research work directed towards the needs of the site management. 1. Poor: There is no research taking place directed towards the needs of the site management.	n/a
			Sources	*	-	*	-
			Detail	++	-	++	-
			Indicator	n/a	Impact of legal and illegal uses of the PA are accurately monitored and recorded	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	The results of research and monitoring are routinely incorporated into planning	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
Sources	-	*	-	-			
Detail	-	+	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Adequacy and appropriateness	Processes	Research and monitoring	Indicator	n/a	Research on key ecological issues is consistent with the needs of the PA	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	Research on key social issues is consistent with the needs of the PA	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	PA staff members have regular access to recent scientific research and advise	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	n/a	Critical research and monitoring needs are identified and prioritised	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
Sources	-	*	-	-			
Detail	-	+	-	-			
			Total	1	6	2	2
			Sources	L=1 M=0 H=0	L=6 M=0 H=0	L=2 M=0 H=0	L=2 M=0 H=0
			Detail	L=0 M=1 H=0	L=6 M=0 H=0	L=0 M=1 H=1	L=0 M=2 H=0
Delivery	Outputs	Achieving work program results	Indicator	n/a	In the past 2 years, threat prevention, detection and law enforcement have been consistent with the PA objectives and work plan	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	**	-	-
			Detail	-	++	-	-
			Indicator	n/a	In the past 2 years, site restoration and mitigation efforts have been consistent with the PA objectives and work plan	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	**	-	-
			Detail	-	++	-	-

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Delivery	Outputs	Achieving work program results	Indicator	n/a	In the past 2 years, wildlife or habitat management has been consistent with the PA objectives and work plan	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	**	-	-
			Detail	-	+	-	-
			Indicator	n/a	In the past 2 years, community outreach and education efforts have been consistent with the PA objectives and work plan	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	**	-	-
			Detail	-	++	-	-
			Indicator	n/a	In the past 2 years, visitor and tourist management has been consistent with the PA objectives and work plan	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	**	-	-
			Detail	-	+	-	-
			Indicator	n/a	In the past 2 years, infrastructure development has been consistent with the PA objectives and work plan	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	**	-	-
			Detail	-	+	-	-
			Indicator	n/a	In the past 2 years, management planning and inventoring have been consistent with the PA objectives and work plan	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	**	-	-
			Detail	-	++	-	-
Indicator	n/a	In the past 2 years, staff monitoring, supervision and evaluation have been consistent with the PA objectives and work plan	n/a	n/a			
How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a			
Sources	-	**	-	-			
Detail	-	++	-	-			

Theme	Element	Criterion	Indicators				
			METT	RAPPAM	EoH	SCSC	
Delivery	Outputs	Achieving work program results	Indicator	n/a	In the past 2 years, staff training and development have been consistent with the PA objectives and work plan	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	**	-	-
			Detail	-	++	-	-
			Indicator	n/a	In the past 2 years, research and monitoring outputs have been consistent with the PA objectives and work plan	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	**	-	-
			Detail	-	++	-	-
			Total	0	10	0	0
			Sources	L=0 M=0 H=0	L=0 M=10 H=0	L=0 M=0 H=0	L=0 M=0 H=0
			Detail	L=0 M=0 H=0	L=3 M=7 H=0	L=0 M=0 H=0	L=0 M=0 H=0
			Indicator	n/a	n/a	Assessment of outputs	n/a
			How is it measured	n/a	n/a	Nominal scale: List of indicators expressed in a numeric way used to measure products and services provided by the site. For each identify: Work output target, Performance, Performance in previous years.	n/a
			Sources	-	-	**	-
			Detail	-	-	++	-
Total	0	0	1	0			
Sources	L=0 M=0 H=0	L=0 M=0 H=0	L=0 M=1 H=0	L=0 M=0 H=0			
Detail	L=0 M=0 H=0	L=0 M=0 H=0	L=0 M=1 H=0	L=0 M=0 H=0			

Theme	Element	Criterion	Indicators			
			METT	RAPPAM	EoH	SCSC
Delivery	Outcomes	Condition of defined values	Indicator	n/a	n/a	n/a
			How is it measured	<p>Condition of the important values of the PA as compared to when it was first designated</p> <p>Ordinal scale using:</p> <p>3. Biodiversity, ecological and cultural values are predominantly intact.</p> <p>2. Some biodiversity, ecological and cultural values are being partially degraded, but most of the important values have not been significantly impacted.</p> <p>1. Some biodiversity, ecological and cultural values are being severely degraded.</p> <p>0. Many important biodiversity, ecological and cultural values are being severely degraded.</p> <p>+1. If the assessment of the condition of values is based on research and/or monitoring.</p> <p>+1. If specific management programmes are being implemented to address threats to biodiversity, ecological and cultural values.</p> <p>+1 if activities to maintain key biodiversity, ecological and cultural values are a routine part of PA management.</p>	n/a	n/a
	Sources	Detail	**	-	-	-
			+	-	-	-
	Indicator	How is it measured	n/a	n/a	Assessment of outcomes of management	n/a
			n/a	n/a	<p>Nominal scale: List of values, their indicators and defined threshold (previously developed for monitoring of management outcomes), and assessment of their current status in relation to threshold, comparison with last assessment, management interventions needed.</p> <p>Ordinal scale: Rating of status using: Significant concern, Caution: may be a developing concern, Good: all appears fine.</p> <p>Rating of trend using: Condition is improving, Condition unchanged, Condition is deteriorating.</p>	n/a
	Sources	Detail	-	-	**	-
			-	-	+++	-

Theme	Element	Criterion	Indicators				SCSC
			METT	RAPPAM	EoH	SCSC	
Delivery	Outcomes	Effects of PA on community	Total	1	0	1	0
			Sources	L=0 M=1 H=0	L=0 M=0 H=0	L=0 M=1 H=0	L=0 M=0 H=0
			Detail	L=1 M=0 H=0	L=0 M=0 H=0	L=0 M=0 H=1	L=0 M=0 H=0
			Indicator	n/a	PA provides community development opportunities through sustainable resource use	n/a	n/a
			How is it measured	n/a	Ordinal scale using: yes-mostly yes-mostly no- no	n/a	n/a
			Sources	-	*	-	-
			Detail	-	+	-	-
			Indicator	The PA is providing economic benefits to local communities E.g. Income, employment, payment for ecosystem services.	n/a	n/a	n/a
			How is it measured	Ordinal scale using: 3. There is a major flow of economic benefits to local communities. 2. There is some flow of economic benefits for local communities. 1. Potential economic benefits are recognised and plans to realise these are being developed. 0. PA does not deliver any economic benefits to local communities.	n/a	n/a	n/a
			Sources	*	-	-	-
			Detail	+	-	-	-
			Indicator	n/a	n/a	Direct benefits of the site to stakeholders	n/a
			How is it measured	n/a	n/a	Nominal scale: List of positive impacts of site on stakeholders and identify the group of beneficiary stakeholders. E.g. List of employment opportunities, ecosystem services, tourism opportunities linked with beneficiary groups	n/a
			Sources	-	-	*	-
			Detail	-	-	++	-
Total	1	1	1	0			
Sources	L=1 M=0 H=0	L=1 M=0 H=0	L=1 M=0 H=0	L=0 M=0 H=0			
Detail	L=1 M=0 H=0	L=1 M=0 H=0	L=0 M=1 H=0	L=0 M=0 H=0			