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Evaluators' Guide

Applying the Framework for Management Effectiveness Evaluation of Coastal and Marine Protected Areas in India

Imprint

Evaluators' Guide: Applying the Framework for Management Effectiveness Evaluation of Coastal and Marine Protected Areas in India

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Acronyms

CBD	Convention on Biological Diversity
CCF	Chief Conservator of Forest
CRZ	Coastal Regulation Zone
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DFO	Divisional Forest Officer
EIA	Environmental impact assessment
ES	Ecosystem services
GBR	Great Barrier Reef
GBRMPA	Great Barrier Reef Marine Park Authority
GIS	Geoinformatics information systems
GIZ	D*eutsche Gesellschaft für Internationale Zusammenarbeit*
ICMBA	Important Coastal and Marine Biodiversity Area
IUCN	International Union for Conservation of Nature
MEE	Management effectiveness evaluation
MPA	coastal and marine protected area
PA	Protected area
PCBs	Polychlorinated biphenyls
RO	Range Officer
SELTMP	Social and Economic Long Term Monitoring Program
SMART	Specific, Measurable, Achievable, Realistic and Time-bound
TR	Tiger reserve
WCMC UNEP	World Conservation Monitoring Centre of the United Nations Environment Programme

1. Context and Background

1.1. Management effectiveness evaluation of protected areas

Coastal and marine protected areas (MPAs) are a crucial instrument of conservation and management of coastal and marine biodiversity. Increasing the coverage of MPAs and strengthening effectiveness of MPAs are high on the global agenda. Aichi Target 11 of the Convention for Biological Diversity and Sustainable Development Goal (SDG) 14 provide the overall framework for cross-sector and multi-stakeholder cooperation for managing MPAs.

Assessment of management effectiveness has especially emerged as a key tool for protected area managers and is increasingly being required by governments and international bodies. For example, the Convention on Biological Diversity (CBD) Programme of Work for Protected Areas calls on all State Parties to continue to expand and institutionalize management effectiveness assessments to work towards assessing 60% of the total area of PAs using various national and regional tools and report the results into the global database on management effectiveness maintained by the World Conservation Monitoring Centre of the United Nations Environment Programme (WCMC UNEP) (http://www.cbd.int/decision/cop/?id=12297). Evaluation of management effectiveness is generally carried out by assessing a series of criteria (represented by carefully selected indicators) against agreed objectives or standards (Mathur et al. 2015).

Protected area (PA) management effectiveness evaluation (MEE) is defined as the assessment of how well PAs are being managed—primarily, whether they are protecting their values and achieving the goals and objectives agreed upon. The term 'management effectiveness' reflects three main themes of PA management:

- Design issues relating to both individual sites and PA systems
- The adequacy and appropriateness of management systems and processes
- Delivery of the objectives of PAs, including conservation of values.

Work on management effectiveness assessment has become an increasingly common component of PA management worldwide. Evaluations have now been undertaken in over 6000 PAs, and the pace of this work is accelerating (Leverington et al. 2008). International organizations working with PAs, such as IUCN and its WCPA, the World Bank and the Global Environment Facility and NGOs such as WWF and the Nature Conservancy have taken a lead in both promoting the importance of management effectiveness as an issue and in providing the technical development and support needed to underpin this effort.

1.2. MEE of protected areas in India

India is amongst the few countries that have institutionalized the MEE process and has taken a lead in evaluating its national parks, wildlife sanctuaries and tiger reserves.

The MEE of national parks and wildlife sanctuaries was initiated in 2006, and the MoEFCC, with technical support from WII, successfully completed one full cycle of evaluating all the terrestrial national parks and wildlife sanctuaries of the country (476 PAs) in 2019.

1.3. The context of coastal and marine protected areas for MEE

Marine and coastal resource management has evolved into a professional practice. There is recognition of the need for MPA managers to be more systematic in using MPAs to improve marine conservation learning and create a set of best management practices. To meet this need, there is consensus among conservation practitioners that evaluation of management effectiveness will improve MPA management practices (Pomeroy et.al 2004). This is particularly relevant in a country like India, where coastal and marine ecosystems provide ecosystem services that form the foundation of the livelihoods of millions of people.

However, given the different situations of terrestrial protected areas and the coastal and marine protected areas, the management effectiveness evaluation framework made for terrestrial protected areas is not the most appropriate instrument for effectiveness evaluation in the coastal and marine protected areas, and the contexts of the two are very different. The concepts and theory of the management of terrestrial protected areas are based on our understanding of the environmental, ecological and evolutionary processes responsible for biological diversity, the sustainability of terrestrial ecosystems and how humans have influenced these processes. How well this terrestrial-based theory can be applied to the management of coastal and marine protected areas depends, in part, on the degree of similarity between these systems.

Marine and terrestrial ecosystems are different with respect to the aquatic medium in which all marine organisms exist. There are no discrete boundaries in marine ecosystems as seen on land. Populations in the marine realm have been found to be genetically more homogenous, and therefore, effective population sizes are larger. Dispersal and response to local events such as pollution or rising temperatures are faster in the case of marine organisms. The wider ‘landscape’ and seascape include the array of land and water uses, management practices, policies and contexts that have an impact within and beyond protected areas and that limit or enhance protected area connectivity and the maintenance of biodiversity. The methods used in managing terrestrial ecosystems cannot be directly applied to marine ecosystems because of a number of reasons.

On land, property rights are reasonably clear: private, public (state) and common property. In contrast, **coastal waters and many coastal spaces such as beaches have always been considered open access, which means that restricting natural resource-based activities such as fishing, seaweed collection and shell collection can be difficult** as it will affect thousands of livelihoods. Also, a critical process in managing MPAs is improved communication and cooperation between managers and other stakeholders is a common outcome of evaluation processes.

There are considerable differences between terrestrial and marine systems in terms of demarcating and monitoring borders. It is easier to fix boundaries of terrestrial systems and ensure their visibility by, for example, using fences and to monitor them by patrolling. In contrast, it is much more difficult to demarcate boundaries of marine ecosystems and make the boundaries visible. **The costs of patrolling seas/oceans and enforcing regulations are higher than those of terrestrial ecosystems**.

A revised "Framework for Management Effectiveness Evaluation of Coastal and Marine Protected Areas in India" has been developed, realizing the need for a customized effectiveness evaluation framework for coastal and marine protected areas, one specifically designed for the Indian MPAs. The accompanying document, "Evaluators' Guide: Applying the Framework for Management Effectiveness Evaluation of Coastal and Marine Protected Areas in India", provides a detailed explanation of each assessment question, as well as structured formats to gather background information to facilitate the assessment.

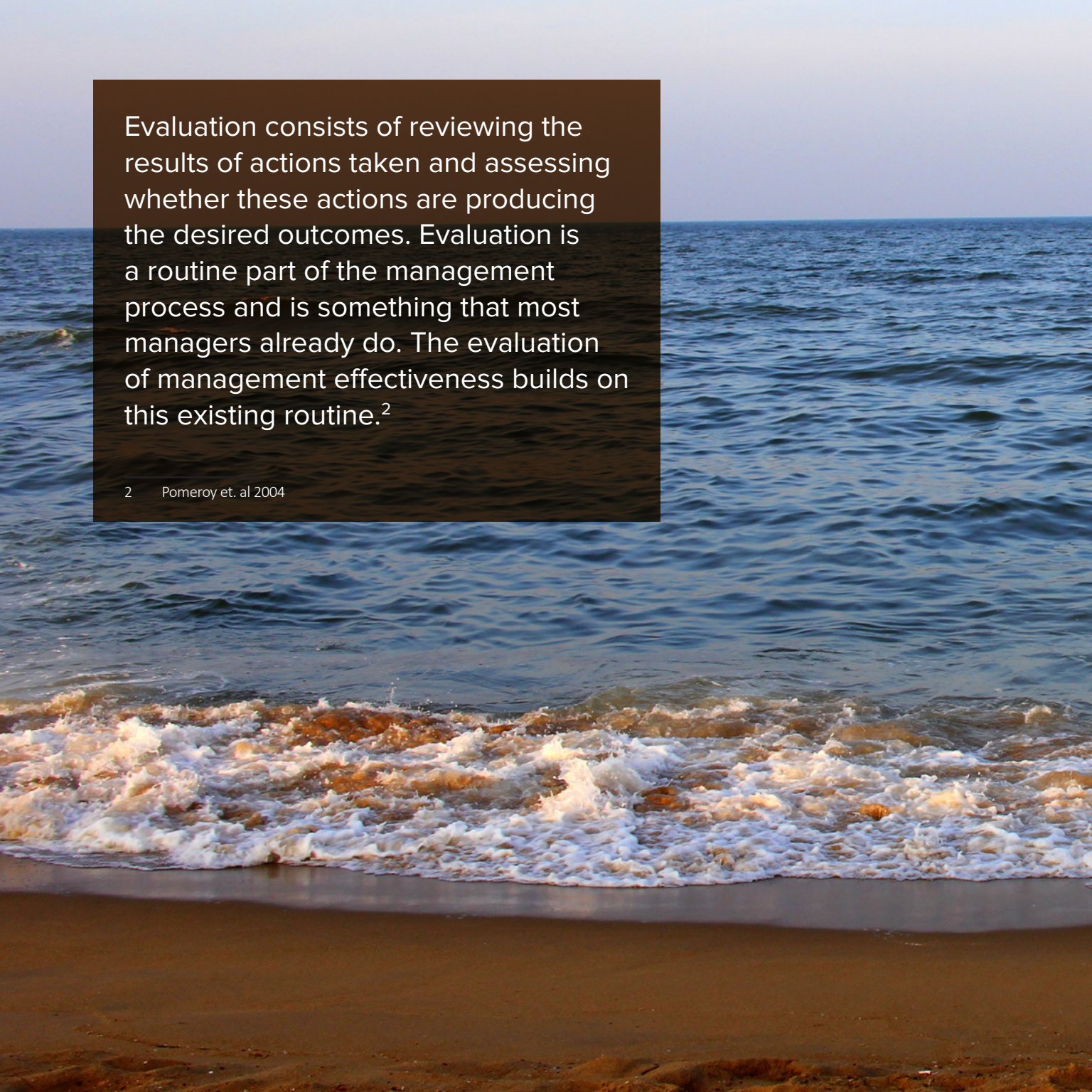
1.4. The process of MEE framework development for coastal marine protected areas in India

The development of the MEE framework for coastal and marine protected areas in India has been facilitated under the Indo-German Project 'Conservation and Sustainable Management of Coastal and Marine Protected Areas (CMPA)' - a technical cooperation project supported by the governments of India and Germany (2012-17). The project was commissioned by the German Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety (BMUB) with funds provided under the International Climate Initiative (IKI) and jointly implemented by the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) India on behalf of BMUB.

The Wildlife Institute of India (WII) and GIZ partnered to work towards implementing a specific set of measures directed at facilitating development of the capacity of the system as well as individual capacities of MPA managers in the field of coastal and marine biodiversity and protected area management.

2016	A curriculum development workshop was successfully organized in early 2016 to lay the foundation for a MEE framework for India and to identify the training needs of the managers and evaluators.
2016	A set of draft guidelines and an evaluators' guide to implement this framework were prepared and pilot tested during the year 2016.
2017	Field testing of the zero draft of the guidelines at Sundarbans, West Bengal, and Marine National Park, Jamnagar was conducted by experts from India and Australia.
2017	In order to finalize the MEE framework and the evaluators' guide, a workshop was organized jointly by GIZ and WII in the Andamans between February 27 and March 1, 2017[1]. The participants included experts on MEE of MPAs from Australia, experts on MEE of terrestrial and tiger reserves from India, evaluators of the ongoing MEE process in India for the terrestrial PAs, MEE experts from WII and GIZ, marine scientists and MPA managers from the Andaman and Tamil Nadu forest departments. The workshop resulted in detailed recommendations for revision of the MEE framework and evaluators' guide.
2018	Several rounds of review of the updated drafts of the guidelines and evaluators' guide were carried out at the Wildlife Institute of India. Experts on wildlife, protected areas and coastal marine life, senior officials from the state forest departments and members of the front-line staff of the coastal states of India participated. Feedback from these workshops and consultations was provided to the authors, and they kept updating the drafts.
2018	A final round of consultation on the updated draft of the guidelines was conducted at WII during a two-days training workshop for Indian Forest Service officers titled "Management Effectiveness Evaluation of Protected Areas" on August 2 and 3, 2018.
2019	The draft was again updated by the authors on the basis of the feedback received.

1 https://wii.gov.in/mee_giz_feb_2017



Evaluation consists of reviewing the results of actions taken and assessing whether these actions are producing the desired outcomes. Evaluation is a routine part of the management process and is something that most managers already do. The evaluation of management effectiveness builds on this existing routine.[2]

2 Pomeroy et. al 2004

2. The Framework

2.1. The MEE framework for coastal and marine protected areas in India

This framework for evaluating MPAs in India differs from other guidance documents for assessing MEE in the following three ways:

- It is designed specifically for Indian coastal and marine protected areas.
- It attempts to assist the managers of MPAs (and MEE assessors) prescriptively by providing them with additional information to assess each of the six elements of MEE.
- It serves as a capacity development instrument for MPA managers in India as it focuses on providing the necessary formats, guidance, explanations and references for effective management of MPAs in India.

The following criteria have been developed to assess each of the six elements of the MEE framework with reference to the MPAs of India. The next chapter provides further details and formats to guide the assessment process and for supporting the evaluators.

CONTEXT

CO1 Are the VALUES of the MPA identified, documented and prioritized by the management?
CO2 Are the major ECOSYSTEM SERVICES (viz., provisioning, regulating, cultural and support) identified, documented and prioritized by the management?
CO3 Are the THREATS to the values in the MPA well documented, assessed and prioritized?
CO4 Have the key stakeholders of the MPA been mapped and analyzed for their possible engagement in the management of the MPA?
CO5 Is there a clear understanding of the regional and national influences relevant to the MPA?

PLANNING

PL1 Does the MPA have a comprehensive management plan/system in place?
PL2 Does the MPA have a planned and effective compliance strategy?
PL3 Are the objectives for the MPA clearly understood, and are they the basis of the management system?
PL4 Is the management effective in addressing the threats to the NATURAL VALUES and ecosystem services of the MPA?
PL5 Have the requirements of the habitat and species recovery measures been identified and documented?
PL6 Is the management effective in addressing the threats to the SOCIAL, ECONOMIC AND CULTURAL VALUES and cultural ecosystem services of the MPA?
PL7 How involved are all the RELEVANT STAKEHOLDERS in planning the MPA?

PL8 How much CROSS-SECTORAL COORDINATION is there in the planning of the MPA?
PL9 Is the management planning system ROUTINELY AND SYSTEMATICALLY UPDATED?

INPUTS

IN1 Are FINANCIAL RESOURCES linked to priority actions and are funds available when needed?
IN2 Are the CAPITAL RESOURCES (vessels, equipment, buildings, etc.) in the MPA adequate and well managed?
IN3 Are there adequate numbers of staff members who are competent to manage the MPA?
IN4 Is adequate BIOPHYSICAL INFORMATION available for effective management of the MPA?
IN5 Is SOCIO-ECONOMIC INFORMATION available for effective management of the MPA?
IN6 What resources are available from key stakeholders for implementing the MPA management plan?

PROCESSES

PR1 Are all high-priority issues effectively managed across key SECTORS and stakeholders?
PR2 What is the level of monitoring and assessment in the MPA?
PR3 Are appropriate capacity development measures being taken with reference to the MPA staff?
PR4 Has there been adequate COMMUNITY ENGAGEMENT for effective MPA management?
PR5 What is the level of compliance in the MPA?
PR6 Is there a responsive system for handling COMPLAINTS AND CONFLICTS about MPA management?
PR7 What is the level of RESEARCH being carried out relevant to effective management of the MPA?
PR8 Have the CUMULATIVE IMPACTS affecting the MPA been identified and prioritized?

OUTPUTS

OP1 Is there a protection system in place to control resource use and/or access in the MPA?
OP2 How much information about the MPA management is publicly available?
OP3 How many of the prioritized threats in and around the MPA are being reduced/ minimized? Or is there an increase in the threats?
OP4 How much research and monitoring have been conducted in the MPA?
OP5 How much socio-economic research has been undertaken in the MPA?
OP6 How effective is the financial system in the MPA?
OP7 Are there a systematic maintenance schedule and funds in place for management of infrastructure/ assets?

OUTCOMES

OC1 How many of the planned management objectives have been achieved?
OC2 Are the populations of endemic/ threatened species declining, stable or increasing?
OC3 Are the prioritized values declining, stable or increasing?
OC4 Are the prioritized threats declining, stable or increasing?
OC5 How supportive are LOCAL COMMUNITIES of the management of the MPA?
OC6 Are the expectations of visitors generally met or exceeded?
OC7 Is the MPA being consciously managed to adapt to climate change?
OC8 Is the MPA being consciously managed for disaster risk reduction?

3. How to Use the Framework

3.1. Overview of different components of the framework:

This framework builds upon the well-known IUCN Management Effectiveness and Evaluation (MEE) framework (Hockings *et al,* 2006, 2nd edition), which is widely regarded as 'best practice' and is globally-endorsed for assessing each of the following six elements of management effectiveness:

Context	Planning	Input	Process	Output	Outcomes
Where are we now?	*Where do we want to be?*	*What do we need to do it?*	*How do we go about it?*	*What were the results?*	*What did we achieve?*

- The framework consists of **six elements:** Context, Planning, Inputs, Processes, Outputs and Outcomes.
- An MPA is assessed with regard to each element with the help of assessment questions. The number of questions varies with the element. There are five assessment questions for Context, nine for Planning, six for Inputs, eight for Processes, six for Outputs and eight for Outcomes.
- The assessment questions under each element are categorized into general assessment questions, which are the default "mandatory questions" to be answered for each MPA irrespective of their status. The second category is the "voluntary questions".
- Specific assessment criteria have been developed to assist with each of the assessment questions. To be able to answer the assessment questions, however, background information needs to be detailed out in the relevant annexure. Only after the annexures are filled in, can the assessment questions be answered.
- Annexures are also available in editable Word formats in the DVDs in the evaluators' kits, and so the assessors/managers can take printouts of the annexure table in larger size paper as per their convenience.
- There are some case examples in the boxes provided along with the main text. Where indicated, these cases act as benchmarks and support the manager/assessor in answering the relevant assessment questions.

3.2. Prioritization

This approach assumes the obvious need to address those issues/aspects that are of highest priority for each MPA because:

- MPA managers should not aim to address all the management issues facing their sites at the same time.
- The available resources in most MPAs are limited, and so there is an obvious need to prioritize.

Consider, for example, the first element of the IUCN framework (i.e., the context – *'where are we now?'*). This is a fundamental element that must be properly understood before trying to assess any of the subsequent elements.

Without a systematic basis for understanding the **priority values** for which their MPAs were declared, or recognizing the **priority threats** currently or potentially facing their MPAs, managers may well seem to be keeping themselves busy undertaking day-to-day management. However, managers may well be expending much of their efforts addressing low priority issues and, as a consequence, failing to maintain the key values for which their particular MPAs were declared.

In a similar way, many MPAs already have a management plan in place. However, unless that plan has been developed on the basis of both the priority values and priority threats, MPA managers could well be misguided in their efforts. Similarly, there are often many government agencies and stakeholders involved in most MPAs. So unless they have all been effectively engaged in developing the management plan and are committed to the priority actions, then the management plan has a far smaller chance of success. Equally, it is important to periodically reassess the threats facing a MPA to ensure that the management efforts are up to date and are both effective and efficient (i.e., "It is just as important to manage the right things, as it is to be managing things the right way").

There are a number of clear advantages of this approach to MEE:

- It is repeatable over time (this is important when the threats are changing).
- It can focus management efforts when resources are constrained.
- Both the methodology and the results can be readily understood by decision makers and stakeholders.

3.3. Repeatability

While a single comprehensive assessment of MEE using this framework will assist an MPA, the real value comes about when periodic assessments are undertaken repeatedly using the same assessment criteria (perhaps at yearly intervals), which should start to show some clear trends.

It is therefore important that as well as documenting the results of MEE, the methodology used also should be clearly documented so that it is repeatable.

3.4. Adaptive management

Adaptive management is a key aspect of managing any marine or coastal area. Parma *et al.* (1998) define adaptive management as *"...managing according to a plan by which decisions are made and modified as a function of what is known and learned about the system, including information about the effect of previous management actions"*.

Management of MPAs is challenging due to a number of complexities not obvious in terrestrial area management. These complexities include:

- The high degree of interconnectedness of the marine environment in all dimensions. Any marine managed area can only be as 'healthy' as its surrounding waters because of the very high levels of 'connectivity' in the marine environment and its biological interdependence with neighboring communities. An extremely well managed part of a marine ecosystem can be of little benefit if the surrounding or adjacent waters are over-used, polluted or inadequately managed.
- The three-dimensional aspects of what marine managers are expected to manage. Most marine ecosystems are not well known nor easily viewed, nor can areas be easily delineated for management purposes.
- The temporal dimension of marine managed areas and any associated natural systems are never static.
- The logistical difficulties of managing marine systems make it much more difficult and expensive than managing similar sized terrestrial environments.

The key components of an effective adaptive management approach are:

- *policies* (i.e., specifying locally appropriate actions on the basis of a sound understanding of the ecosystem's status and behavior);
- *partnerships* with others where responsibility is shared;
- *management systems* that implement the policies; and
- *monitoring plans* to determine system responses and provide a basis for adjusting management.

Any successful management regime must integrate all four aspects 'on the ground' (i.e., the policy and the implementation/management aspects cannot be separated). Furthermore, the management regime must be adaptable and be able to incorporate changes such as new information becomes available or as circumstances change. (See also Component 5 of PLANNING – ensuring the management system is systematically reviewed and updated).

3.5. MEE as a capacity development tool

If used appropriately during implementation, these criteria and framework facilitate development of the capacity of the MPA managers and the system of MPA management planning in the country through identification of key gaps at each stage i.e., Context, Planning, Input and Process.

Given that the coastal and marine protected area management is in nascent stages in India and many of the MPAs are yet to get their management plans, the first phase of evaluation in the country must be used as the 'Management Effectiveness Pre-evaluation' phase (2021-2025). This pre-evaluation will serve as a capacity development process to identify and assess specific capacity gaps at enabling environment for MPA management, MPA management system and competence of MPA managers. The capacity needs of each MPA/region/state should be prioritized and an action plan developed to enhance the capacities of the MPA with dedicated funding and technical support during the pre-evaluation phase.

The next evaluation should be considered as the 'First Management Effectiveness Evaluation". In the subsequent evaluations also, the evaluators must present an in-depth capacity needs assessment report of each MPA evaluated with a list of prioritized capacity development needs.

A word of caution[3]

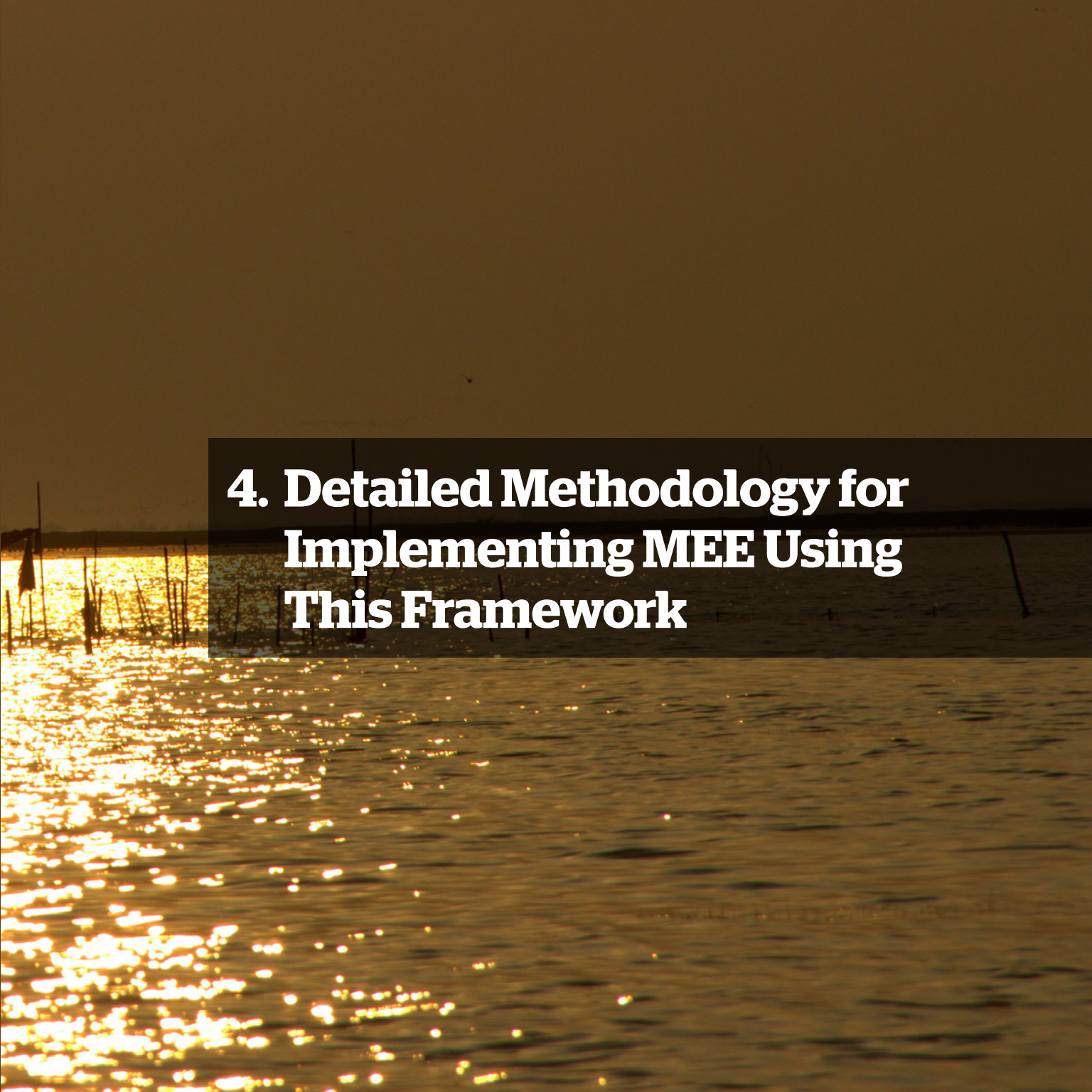
Most management effectiveness evaluations are based on 'expert elicitation' using workshops, interviews or questionnaires, which capture the knowledge of assessors. As such, they are prone to errors and cognitive biases ..... In particular, qualitative assessment tools can be prone to what are known as framing effects, whereby people have variable interpretations of what they are being asked to assess .....

Loosely defined assessment questions can lead to several aspects of the way a question is framed (the assessment frame) being misinterpreted, particularly the scope (which aspects of management are being considered), the scale (which parts of the protected area are being considered) or the time frame (the period over which outcomes are being considered) ..... These types of error are called framing effects and mean that assessors consider different things when making their judgments, such that evaluations cannot be confidently compared between different protected areas. For example, one assessor may evaluate outcomes across the whole protected area, while another only evaluates the area of the reserve under active management. To minimise framing effects, it is important to make sure that these aspects of the evaluation are made clear in the wording of the assessment questions ..... It cannot be assumed that assessors will understand what is expected of them without explicit directions.

It can be particularly difficult to gain consistent responses to questions that assess several different things simultaneously and offer response choices that are quite complicated —for example, questions that measure both the numbers and the capacity of staff, or those that assess the availability and implementation status of management plans. These should be avoided.

To enable greater consistency across different methodologies and studies, some aspects of management effectiveness can draw on standard classifications and lexicons such as the standard threat classification.

3 Source: Hockings et al (2015)



4. Detailed Methodology for Implementing MEE Using This Framework

4.1. Developing a better understanding of the context

Five assessment questions (CO1 to CO5) are to be answered to develop a better understanding of the context of the MPA. **Having a good understanding of the context is a fundamental underpinning of many of the subsequent elements of the framework**, and so it is useful if all five questions below are answered for each MPA.

4.1.1. CONTEXT CRITERIA– Assessment of the PRIORITY VALUES for which the MPA was declared

The values of an MPA may include such things as significant biological values (e.g., biodiversity and critical habitats); cultural or historical values; traditional (Indigenous) values; socio-economic values; and educational or scientific values.

MPA managers need to not only recognize the values of an MPA but also recognize whether these values are of local, regional, national or global significance.

Steps involved in identifying and documenting values of an MPA

1. The first task is to determine which values (natural, cultural and socio-economic values) occur in the MPA. This can be easily done by the MPA manager (or MEE assessors) using the checklists from annexures 1a and 1b.
2. The second task is to assess the extent and condition of each value. This can be done by using the format provided as annexures 2a and 2b (for natural and socio-economic values, respectively). The filled up format will look like the example on the next page. In this format, the key information to be entered is:
    i. the extent of each value (i.e., best-guess approximation of the number and/or the area in hectares, whichever is the appropriate measure).
    ii. the condition of each value (i.e., Very Good, Good, Poor or Very Poor) and its trend (improving, stable or deteriorating) over the previous 2-3 years (trend is shown by directional arrows i.e., ↑↓↔).
    iii. Whether the value is significant from the viewpoint of biodiversity and/or socio-economic relevance and/or scientific and educational relevance and/or historical/ cultural relevance and/or traditional and indigenous knowledge. Each category has an equal score of 1.
    iv. Whether the value is important only locally and/or regionally and/or nationally and/ or globally. Categories have differential scores- the greater the importance, the greater the score, viz., values with local importance get a score of 1, national importance gets a score of 2, regional importance gets a score of 3, and values with global importance get a score of 4.

When filling the significance and importance column, the evidence on which the assessment is based is also to be indicated. Different symbols may be used to indicate the differing levels of knowledge about various values as follows:

● Adequate high-quality evidence and high level of consensus

◖ Limited evidence or limited consensus

○ Inferred or anecdotal; very limited evidence

3. The third task is to prioritize the values of each MPA. For this a simple method of adding the scores obtained by each value, under the significance and importance column, is used. The highest end score gets the highest priority.

   Using such a scoring system will help identify the highest priority values in that particular MPA. These prioritized values must be reflected in any subsequent management or planning for the park.

4. Example of filling in the expanded checklist using marine/marine-related habitats within the MPA

Values and attributes (taken from Annexure 1 or 2)	Extent (number and/or area in hectares	Trend (improving, stable or deteriorating) **Condition (Very Good, Good, Poor or Very Poor)**				Significance of values (Each colum=1)					Importance (Local = 1; National=2; Regional=3; Global=4)				Score	Priority values
						Biodiversity	Socio-economic	Scientific/ educational	Historical/ Cultural	Traditional/ indigenous	Local	National	Regional	Global		
Islands	15 coral cays/low islands		↓			●	●	●	●	●	●	●			5+3=8	2
Beaches	4 km of beaches		↓			◖	◖		◖		◖	◖			3+3=6	3
Rocky coastlines	1 km of rocky coast	↓				◖	◖				◖	◖			2+3=5	4
Mangrove forests	5 km²	↓				●	●	●	●				●	●	4+7=11	1
Seagrass meadows	Approx. 4 ha			–		○	○				○	○			2+3=5	4
River deltas	Approx. 4 ha			↓			●		●	●	●				3+1=4	5
Shallow reefs (<25 m)	Approx. 6 ha				↓	◖	◖				◖	◖			2+3=5	4
Deeper reefs (>25 m)	Present but extent unknown		–			○		○			○				2+1=3	
Inter-reef communities	Approx. 12 ha			–		◖	◖				◖				2+1=3	5
Shoals	Present but extent unknown			–		◖	◖				◖	◖			2+3=5	4
Halimeda banks	Not known to occur														0	
Continental slope	Not known to occur														0	
Channels and canyons	Not known to occur														0	
Open waters	40 km²	–				●	◖	○			○				3+1=4	

After completing annexures 1a, 1b, 2a, and 2b, the MPA managers/ MEE evaluators are ready to answer the following assessment question:

CO1 –Are the VALUES of the MPA identified, documented and prioritized by the management?		
Indicator data verification = Annexures 1a, 1b, 2a, 2b and 3		
Assessment criteria	**Score**	**Comments/justification**
Only a few values of the MPA have been identified and documented.	Poor (Score 2.5)	
Many values of the MPA have been identified but have not been systematically assessed or monitored.	Fair (Score 5)	
Most MPA values systematically identified, documented and assessed but have been nor regularly monitored.	Good (Score 7.5)	
All MPA values have been systematically identified, documented, assessed and prioritized.	Very good (Score 10)	
All the MPA values have been systematically identified, documented, assessed and prioritized and are periodically monitored.	Excellent (Score 12.5)	Bonus score. To be reported separately in final score card for relevant MPAs

4.1.2. CONTEXT- Understanding the KEY ECOSYSTEM SERVICES of the MPA

The full range of ecosystem services–provisioning, regulating, cultural and support–needs to be identified using appropriate methods. Knowing all the ecosystem services that an MPA provides is key to effective management and to gain support from the local community as well as dialogue with key sectors such as fisheries.

A checklist of potential ecosystem services is available as **Annexure 3**; an initial list has been collated for each MPA, then additional information needs to be added to develop a comprehensive understanding of the full range of ecosystem services of the MPA at temporal and spatial scales.

It is also important to prioritize the ecosystem services on the basis such aspects as the extent of the MPA used and the impact caused (if any) by that use. For prioritizing ecosystem services in an MPA, not only the quantitative score of the 'extent of use', but also a qualitative estimate of the possible trade-offs of the ecosystem service with another will help.

> *An Ecosystem Services (ES) trade-off is a situation where the use of one ES directly decreases the benefits supplied by another. A change of ES use could be triggered by the demand and/or the supply side. A trade-off could take place in the same place or in a different area (e.g. impact of the management of a forest for wood production on local recreation and downstream water quality). A special case is a trade-off between the present and future use of the same ES (e.g. overharvesting of fish stock)*[4].

4 Turkelboom, F., Thoonen, M., Jacobs, S., Garcia-Llorente, M., Martin-Lopez, B., Berry, P., 2016. Ecosystem services trade-offs and synergies. In: Potschin, M., Jax, K. (eds.), OpenNESS Ecosystem Services Reference Book. EC FP7 Grant Agreement no. 308428. Available via: http://www.

In the column "Ecosystem services trade-offs (indicate major trade-offs with other ES)" indicate, against each ES the other uses/ ecosystem services from the MPA that are negatively affecting this ecosystem service. This will provide a sense of the threat that this ES is facing because of the other uses in the MPA.

The information from the ES trade-offs should guide specific management interventions required in the MPA and should be recorded in the last column in **Annexure 3**.

CO2 - Are the major ECOSYSTEM SERVICES (viz., provisioning, regulating, cultural and support) identified, documented and prioritized by the management (considering Annexure 3)?		
Assessment criteria	**Rating/Score**	**Comments/justification**
Few, if any, ecosystem services have been identified for the MPA.	Poor (Score 2.5)	
Some ecosystem services have been identified and occasionally updated for the MPA.	Fair (Score 5)	
Most ecosystem services have been identified and are routinely updated for the MPA.	Good (Score 7.5)	
All the ecosystem services have been systematically identified, and are systematically updated and prioritized by the MPA managers.	Very good (Score 10)	

4.1.3. CONTEXT – Assessment of the highest PRIORITY THREATS impacting the MPA

The next task is to identify the highest priority threats facing the MPA. In determining the relative priority of these factors, managers need to determine whether these factors are occurring within or adjacent to the MPA, whether they are having positive or negative impacts and whether they are currently occurring or potential.

It might be possible that the MPA managers may not be able to recognize or foresee some significant threats affecting their MPA, given the vastness of the coastal and marine ecosystems and our limited understanding of these. The following sequence is designed to identify either current or potential threats and to prompt managers to think of threats they might not have otherwise considered.

The first step is to assess the factors affecting the MPA to determine the key/ priority threats. For this, the MPA managers/MEE assessors should use the template and additional information provided in Annexure 4.

Annexure 4 contains a categorized generic list of the factors affecting MPAs. This list has been developed for pan-India use, and so some categories/ factors may not apply to certain MPAs. The factors are grouped into

openness-project.eu/library/referencebook.

the following 14 categories, and these are explained in the table of Annexure 4, with examples listed under each sub-heading.

1	Residential & Commercial Development	6	Human Intrusions & Disturbance	11	Climate Change and Severe Weather
2	Agriculture & Aquaculture	7	Natural System Modifications	12	Social/Cultural Change
3	Energy Production & Mining	8	Invasive & Problematic Species, Pathogens & Genes	13	Management Activities
4	Transportation & Service Corridors	9	Pollution	14	Other Factors *(not listed)*
5	Biological Resource Use	10	Geological Events		

The first stage in this assessment is to assess whether the factors listed in column 1 are **present** or **absent** in the MPA. If the factor is not relevant altogether, then move on to the next factor; however, if the factor is relevant, then the entire row needs to be filled. Column 2 can be used to specify the factors that are relevant/ significant for the MPA in that particular factor category

In the top row, you will see six colour-coded boxes. The first two boxes ask whether the impact of the factor in that row is **positive** or **negative** (just tick the relevant box); the next two boxes look for information on whether it is current or potential threat (again tick the relevant box(es). Some factors may be currently having an impact or there may be a strong likelihood of them affecting the MPA in the near future – so there is an option to tick 'current' and/or 'potential' against each factor (or it could be both if a factor currently occurs but is expected to increase in either extent or intensity in the future). The last two boxes are for entering information on whether the source of the factor is **inside** the MPA or **outside** it.

For each of these three alternatives at least one box should be chosen if the factors are deemed relevant to the MPA. There is also the opportunity to tick both alternatives (refer to the tourism example above and the option of a pressure being both **current** and **potential**; similarly the source of the factor could be both **inside** and **outside** an MPA).

At the end of the comprehensive list of factors there is an opportunity (question 14) to add any additional factors that affect the property but have not been covered in the preceding sections.

The next task is to prioritize the negative factors affecting the MPA. A format to assist with this is provided as **Annexure 5.** It is a good idea to review this table and check that it accurately represents the situation in the MPA. In this format, the list of negative factors, as identified in Annexure 4, needs to be reproduced as a list in the first column.

Further assessment should then be undertaken by responding to the following qualifiers:

- **Spatial Scale** – How much is the area affected by the factor?
- **Temporal Scale** – What is the frequency of the impact?
- **Impact** - Assesses the impact on the values.
- **Management Response** - Assesses the capacity (i.e., staff time, resources, budget, knowledge) of the management to respond to the negative factors.
- **Trend** - How has the trend developed in recent times (e.g., over the last 6 years)?

The scoring system for the above qualifiers is provided in the box below the table in Annexure 5 itself. Scoring will enable prioritization of the relevant negative factors for that particular MPA - the highest priority negative factors must then be reflected in any subsequent management or planning for the park.

Once the annexures 4 and 5 are completed, the MPA managers are ready to answer the following assessment question:

CO3 - Are the THREATS to the values in the MPA well documented, assessed and prioritized (considering annexures 4 and 5)?		
Assessment criteria	**Rating/Score**	**Comments/justification**
Virtually none of the threats have been systematically documented or assessed.	Poor (Score 2.5)	
Some threats have been identified but have not been systematically assessed.	Fair (Score 5)	
Most threats have been systematically identified and assessed.	Good (Score 7.5)	
All threats have been systematically identified, assessed and prioritised using a risk assessment process.	Very good (Score 10)	
All threats have been systematically identified, documented and assessed, and their prioritization (ie a risk assessment process) is periodically reviewed and updated.	Excellent (Score 12.5)	

4.1.4. CONTEXT – Understanding the KEY STAKEHOLDERS of the MPA

Stakeholders are a group or organisation or individual who has an interest/ statutory responsibility/ practical role / influence or who can be positively or negatively impacted by or cause an impact on the MPA.

Key stakeholders such as fishers, tourist operators, local communities and key sectoral departments need to be identified and categorized. Such a list may also include political leaders at the local, state and national levels, NGOs and even members of the international community.

One characteristic of many MPAs is that they involve a large number of stakeholders, each with their own needs, perspectives, values and goals. The stakeholders may include people who live within the MPA, such as indigenous groups with longstanding claims to use the land. They may also include people around the world whose interest is in the conservation values of the park, such as tourists and local, national or international NGOs who value the protected area for its flora, fauna, scenery and wilderness characteristics. Many of these people may never see the area but may enjoy it remotely through photos, books, television or other media. Then there are the stakeholders who live in nearby communities.

It is important to list all the relevant stakeholders (both internal and external) showing their function in the system and their sphere of influence. Such a list is known as a stakeholder landscape. The construction of the landscape ensures that the boundaries of the system governing the MPA will be properly identified and considered.

The following steps will need to be executed:

- Listing of all stakeholder organizations/groups/individuals relevant to the conservation of coastal and marine biodiversity via protected areas in each partner state, as well as in India.
- Use the format available in **Annexure 6** to classify all the stakeholders with regard to:
    - their size/numbers, geographical area (site/state/National/Global), mandate and role in MPA management
    - their interest in and support to the MPA [give score from the scale of 0-5, where 5= very high and 0=negligible]
    - their power to influence the management of coastal and marine protected areas [give score from the scale of 0-5, where 5=very strong and 0= very low]
    - The relevance score can be obtained by adding the interest and power score, and accordingly the most relevant stakeholder can be ranked.

Information from Annexure 6 can then be used to plot the Power-Interest grid and to decide on the type of engagement with each stakeholder.

It is also useful to maintain a STAKEHOLDERS' REGISTER for the relevant MPA in which the names and contact details of relevant individuals/ groups/ institutions can be kept and updated periodically for quick access.

CO4 – Have the key stakeholders of the MPA been mapped and analyzed for their possible engagement in the MPA management (considering Annexure 6)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
While some of your stakeholders are known, there is no mapping of stakeholders for your MPA, nor do any stakeholders assist the managers with any planning and management decisions of the MPA.	Poor (Score 2.5)	
The mapping of MPA stakeholders has been completed, but they have not been integrated into the management of the MPA, nor are their routines being routinely updated.	Fair (Score 5)	
The stakeholders of the MPA have been mapped and their details are regularly updated, but they are not actively engaged in planning or in decision making in the MPA.	Good (Score 7.5)	
A wide range of stakeholders (including local, regional and national stakeholders) have been systematically mapped, and they regularly assist the managers with planning and with decision making in the MPA.	Very good (Score 10)	
All the stakeholders have been systematically mapped and prioritized, and their details are routinely and systematically updated. The stakeholders are regularly engaged by the managers of the MPA in decision making in the management.	Excellent (Score 12.5)	

4.1.5. CONTEXT – Understanding the regional and national level influences relevant to their MPA

Understanding the various national laws and international agreements and conventions that are relevant to each MPA is an important part of the context – **Annexure 7** provides a list of relevant international, national and state-level influences. Further details about the legal and policy instruments relevant to MPAs can be found in Module 5 of the training material developed for MPA managers in India[5].

Note: This assessment may be seen together with an earlier assessment of the importance of the MPA at a spatial scale in Annexure 2B (i.e., local, national, regional or global importance).

CO5 – Is there a clear understanding of the REGIONAL AND NATIONAL LEVEL INFLUENCES relevant to this MPA (considering Annexure 7)?		
Assessment criteria	**Rating/Score**	**Comments/justification**
Only a few local and/or national governance instruments are known or applied.	Poor (Score 2.5)	
Some regional and/or national-level governance instruments have been identified and are occasionally updated for the MPA.	Fair (Score 5)	
Most regional and/or national level influences have been identified and are routinely updated for the MPA.	Good (Score 7.5)	
All relevant cross-sector governance instruments have been identified and are regularly referred to as part of the management of the MP.	Very good (Score 10)	
Experience and good practices from the management of the MPA have been documented and have informed policy making for MPAs at the national or international level	Excellent (Score 12.5)	

5 Neeraj Khera, K. Sivakumar and Sarang Kulkarni (Comp.) 2015. Training Resource Material on Coastal and Marine Biodiversity and Protected Area Management for field-level MPA managers. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) India and the Wildlife Institute of India. ISBN 978- 81-933282-1-7. Pp 604 (set of 8 modules).

5. Developing a Better Understanding of ‘Planning”

Nine assessment questions (PL1 to PL5) help identify and assess the key components within the important element of 'planning'. To assist with each of these assessment questions, specific assessment criteria have been developed. To be able to answer the assessment questions, however, background information needs to be detailed out in the relevance annexure. Only after the annexures are filled in, can the assessment questions be answered.

5.1. PLANNING – ensuring there is an effective planning system in place to effectively address the priority risks/threats

An 'effective planning system' may comprise a single comprehensive management plan or an integrated set of complementary plans prepared by several agencies that collectively address the major risks/threats to the MPA's values. There are some advantages and disadvantages to each of the approaches to planning.

Most MPAs have some form of management plan. Some of these plans are comprehensive, but many are quite basic and relatively narrow in their focus. Very few plans systematically address all the priority values and the priority threats – consequently a thorough assessment of these matters as a fundamental part of the 'Context' will provide a good basis upon which to develop a good management plan that effectively addresses the key management priorities.

A good management plan is essential for a well-managed and effective MPA – however, unless that plan is periodically reviewed and updated, even a good plan can quickly become out-of-date and a poor basis upon which to make management decisions.

Annexure 8 provides a checklist of possible management tools relevant to managing MPAs. Not all these tools will apply to most MPAs, and some may well be the responsibility of other management agencies. For example, many of the fishing rules/ regulations that apply within a MPA may be the primary responsibility of another agency. Yet, as those rules apply within the MPA, they should be regarded as a part of the overall management approach. Similarly controls on

Case Example 1
Management Plan at GBR

Unlike what many people expect, there is not a single management plan for the Great Barrier Reef. Rather there is a 'management system' comprising a wide range of management plans, other tools and approaches including spatial and temporal planning. This range of multi-dimensional management arrangements (spatial, non-spatial and temporal) is applied in various ways, some within the Zoning Plan, but others via additional statutory or non-statutory documents.

Non-spatial management arrangements include bag limits and size limits for certain fish species and various permit conditions; temporal management arrangements include seasonal closures at key fish spawning times or temporary closures for short term activities such as military training.

shipping through the MPA might be the responsibility of another agency or management body. Non-spatial and temporal management arrangements should also be identified if applicable (see Case Example 1).

When completing Annexure 8, it is important to write the actual names of the management tools that apply in the MPA (ie. document all existing management plans, policies and other planning documents with their exact titles) along with the dates those tools were enacted and are valid up to and the area(s) to which they apply (some plans might apply across the entire MPA, but other plans or management documents might apply only in special designated locations)

It is also important to recognize that not all the management tools for a specific MPA need to apply in just a two-dimensional space – multiple layers of spatial planning can overlap and apply in the same area, provided they are not conflicting and are complementary. This means specific guidance can be provided just for a single or specific use or activity without also needing to show all the other spatial plans or tools that apply over the MPA. Such layers can be readily isolated or combined if a geographic information system (GIS) exists for the MPA; however, only a few MPAs will have the technology for such information layers.

Integrated management (taking into consideration other planning documents for adjacent areas, both marine and terrestrial) will help achieve an ecosystem-based management approach and will lead to more effective management of the MPA.

Once annexure 8 is completed, the MPA manager/ MEE assessor will find it easy to answer the following assessment questions:

PL1 - Does the MPA have a comprehensive management system in place (Considering Annexure 8)?		
Assessment criteria	**Rating/Score**	**Comments/justification**
Management is undertaken without the existence of an Annual Plan of Operation.	Poor (Score 2.5)	
A basic Annual Plan of Operation exists.	Fair (Score 5)	
A Management Plan exists, but it is not comprehensive.	Good (Score 7.5)	
The site has a comprehensive science-based management plan (or management system).	Very good (Score 10)	
The site has a comprehensive, science based management plan prepared through a multi-stage participatory process.	Excellent (Score 12)	

PL2 - Does the MPA have a planned and effective compliance strategy (considering Annexure 8)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
There is little, if any, compliance, and there is no formal compliance strategy.	Poor (Score 2.5)	
The MPA has a basic compliance and protection strategy, but the measures are applied in an *ad-hoc* way.	Fair (Score 5)	
The MPA has a comprehensive compliance and protection strategy that is planned and regularly reviewed.	Good (Score 7.5)	
The MPA management engage key relevant systems of information, intelligence and surveillance to regularly update their compliance and protection strategy, e.g. using MPA rangers, the police, the coast guard, the navy, etc.	Very good (Score 10)	

5.2. PLANNING – a clear hierarchy of objectives for the MPA

Often, management objectives are too general, abstract or unclear to directly serve as a basis for effective management (or for evaluating effectiveness!). For example, the objective *'to protect biodiversity'* is by itself too broad to be effectively measured. Furthermore, this is realistically not a sensible measure in most marine ecosystems because much of the marine biodiversity still remains to be discovered, let alone described).

Some MPAs may already have a hierarchy of objectives without realising it:

- The legislation might provide the highest-level objective.
- Zones within a MPA might also indicate that some areas have differing objectives.

If the management plan for the MPA does not have a clear set of objectives nor a hierarchy of those objectives, then there may be some issues for managers or decision-makers when decisions need to be made or priorities considered.

Some examples of hierarchical objectives are provided in Case Example 2.

Case Example 2

The importance of a hierarchy of objectives - at Great Barrier Reef

At the highest statutory level, the Authority's legislation stipulates a primary overriding main objective:

The main object of this Act is to provide for the long-term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef Region.

The legislation then provides a clear hierarchy of other objectives stipulating that the other objectives can only occur 'so far as is consistent with the main object'.

The other objectives of this Act are to do the following, so far as is consistent with the main objective:

(a) allow ecologically sustainable use of the Great Barrier Reef Region for purposes including the following:
  (i) public enjoyment and appreciation;
  (ii) public education about and understanding of the Region;
  (iii) recreational, economic and cultural activities;
  (iv) research in relation to the natural, social, economic and cultural systems and value of the Great Barrier Reef Region;

(b) encourage engagement in the protection and management of the Great Barrier Reef Region by interested persons and groups, including Queensland and local governments, communities, Indigenous persons, business and industry;

(c) assist in meeting Australia's international responsibilities in relation to the environment and protection of world heritage (especially Australia's responsibilities under the World Heritage Convention).

This clear hierarchy can assist decision-makers if there is any uncertainty regarding what activities might take precedence. In addition, each zone within the GBR also has its own statutory objective and a further 'hierarchy' of objectives – as outlined in the table on the following page.

Zone name	Zone colour	Statutory objective(s) of the zone	Equivalent IUCN category
General Use Zone	Light blue	To provide for the conservation of areas of the Marine Park, while providing opportunities for reasonable use.	**VI**
Habitat Protection Zone	Dark blue	(a) To provide for the conservation of areas of the Marine Park through the protection and management of sensitive habitats, generally free from potentially damaging activities; and (b) subject to (a), to provide opportunities for reasonable use.	**VI**
Conservation Park Zone	Yellow	(a) To provide for the conservation of areas of the Marine Park; (b) subject to (a), to provide opportunities for reasonable use and enjoyment, including limited extractive use.	**IV**
Buffer Zone	Olive green	(a) To provide for the protection of the natural integrity and values of areas of the Marine Park, generally free from extractive activities; (b) subject to (a), to provide opportunities for: (i) certain activities, including the presentation of the values of the Marine Park, to be undertaken in relatively undisturbed areas; and (ii) trolling for pelagic species.	**IV**
Scientific Research Zone	Orange	(a) To provide for the protection of the natural integrity and values of areas of the Marine Park, generally free from extractive activities; and (b) subject to (a), to provide opportunities for scientific research to be undertaken in relatively undisturbed areas.	**Ia**
Marine National Park Zone	Green	(a) To provide for the protection of the natural integrity and values of areas of the Marine Park, generally free from extractive activities; and (b) subject to (a), to provide opportunities for certain activities, including the presentation of the values of the Marine Park, to be undertaken in relatively undisturbed areas.	**II**
Preservation Zone	Pink	(a) To provide for the preservation of the natural integrity and values of areas of the Marine Park, generally undisturbed by human activities.	**Ia**
Commonwealth Islands Zone	Cream	(a) To provide for the conservation of the natural integrity and values areas of the Marine Park above the low water mark; and (b) To provide for use of the zone by the Commonwealth; and (c) subject to (a), to provide for facilities and uses consistent with the values of the area.	**II**

Examining closely the objectives of each of the zones reveals:

- The primary purpose of four of the zones (General Use, Habitat Protection, Conservation Park and Commonwealth Islands zones) is to '***provide for conservation***'.
- The primary purpose of three zones (Buffer, Scientific Research and Marine National Park zones) is the ***'protection of the natural integrity and values'***.
- The primary purpose of the Preservation Zone is the ***'preservation of the natural integrity and values'***.

So there is not only a hierarchy between zones (General Use being the least restrictive and Preservation being the most restrictive): the legal wording of each objective indicates a hierarchy within most zones , i.e., subsequent part(s) of the wording of each objective, such as part (b), are subject to the first part (a).

The different zones can therefore be used to separate conflicting uses. Furthermore, the objective of the zone can provide decision-makers with a clear indication of what is appropriate and what is not appropriate in each zone (i.e., if an activity is not compatible with the objective of a zone then that activity is clearly not appropriate in that zone).

PL3 - Are the objectives for the MPA clearly understood and the basis for management?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
The MPA is managed without a clear understanding of the objectives fof the MPA.	Poor (Score 2.5)	
The MPA has some objectives, but the MPA is not managed according to these objectives.	Fair (Score 5)	
The MPA has agreed objectives, but it is only partially managed in accordance with these objectives.	Good (Score 7.5)	
The MPA has clear objectives that are widely understood and that form the basis of the management of the MPA.	Very good (Score 10)	
The MPA has clear and prioritized objectives that form the basis of all the management and decision-making.	Excellent (Score 12)	

5.3. PLANNING – each priority risk/ threat is addressed by actions with smart targets

For each of the high priority threats identified as part of the assessment of the Context, there needs to be a clear management action. Many experts advocate the use of SMART targets (Specific, Measurable, Achievable, Realistic and Time-bound) and suggest that all such targets need to be clarified or restated in very practical terms.

- It is important that specific actions be developed to address each of the priority risks and threats assessed in **Annexure 5**. In developing these actions, the application of **SMART** targets (Specific, Measurable, Achievable, Realistic and Time-bound) is recommended, with all such targets stated in very practical terms.

SMART targets

Specific- State exactly what you want to accomplish by posing five "W" questions:

- Who: Who needs to be involved?
- What: What needs to be accomplished?
- Where: Identify a location.
- When: Establish a time frame.
- Why: Specific reasons, purpose or benefits of attaining the target.

Measurable - To demonstrate that your target is measurable or to evaluate the extent to which the target has been met, ask questions such as: *"How much? How many? How will I know when it is accomplished?"*

Attainable *(or* ***Achievable****)* – Targets are more attainable when you carefully plan the steps to achieve the target and establish a realistic time frame that enables each of those steps to be undertaken.

Realistic *(or* ***Relevant*** *or* ***Resourced****)* - A target must be realistic and represent something that is achievable within the allocated time frame, utilizing the available resources. If possible, base it on something similar that has been accomplished in the past. Certainly, if the necessary resources are not likely to be available, then the target is not realistic.

Timely – It is important to set one or more target dates, deadlines or a frequency of actions. A specific deadline (e.g., *"by end May 2016"*), provides a clear time frame by which the action should be completed. Without clear and realistic deadlines or dates, the target has no focus.

Case Example 3: *GBR Reef 2050 Sustainability Plan* shows actions and targets linked to objectives and desired outcomes.

Case Example 3

A snapshot from the *GBR Reef 2050 Sustainability Plan*, showing targets, objectives and outcomes

2015-2020 ACTIONS		2020 TARGETS	2035 OBJECTIVES	2050 OUTCOME
Improving broadacre land management		WQT1		
WQA1	By 2018, review and update the Reef Water Quality Protection Plan and its targets.	By 2018: • at least a 50 per cent reduction in anthropogenic end-of-catchment dissolved inorganic nitrogen loads in priority areas, on the way to achieving up to an 80 per cent reduction in nitrogen by 2025 • at least a 20 per cent reduction in anthropogenic end-of-catchment loads of sediment in priority areas, on the way to achieving up to a 50 per cent reduction by 2025 • at least a 20 per cent reduction in anthropogenic end-of-catchment loads of particulate nutrients in priority areas • at least a 60 per cent reduction in end-of-catchment pesticide loads in priority areas. [From *Reef Water Quality Protection Plan 2013* targets, based on a comparison with a 2009 baseline]	WQO1 Over successive decades the quality of water entering the Reef from broadscale land use has no detrimental impact on the health and resilience of the Great Barrier Reef.	**Reef water**
WQA2	Continue improvement in water quality from broadscale land use through implementation of *Reef Water Quality Protection Plan 2013* actions.			
WQA3	Pending the outcome of the review of regulation and market-based mechanisms to improve water quality, require farmers to be accredited to best management practice guidelines or to operate under an Environmental Risk Management Plan.			
Improving water quality from all sectors				
WQA4	Implement innovative management approaches through the Reef Trust for improving water quality.			
WQA5	Increase use of cost-effective measures to improve water quality from broadscale land use, urban, industrial and port activities.			
WQA6	Establish an agreed performance-based voluntary reporting framework across agriculture, urban, ports and industry to measure management efforts to achieve best management practice and to inform regional report cards.			
WQA7	Finalise and implement plans (e.g. Water Quality Improvement Plans and Healthy Waters Management Plans) for Reef catchments and key coastal areas, identifying implementation priorities for protection of the Reef.			
WQA8	Increase industry participation in regional water quality improvement initiatives and partnerships aimed at managing, monitoring and reporting of water quality. These should build on existing initiatives such as: • Fitzroy Partnership for River Health • Gladstone Healthy Harbour Partnership • Mackay Whitsunday Healthy Rivers to Reef Partnership.			
WQA9	Review and update water quality objectives and Great Barrier Reef Marine Park Authority Water Quality Guidelines at Reef-wide and regionally relevant scales based on scientifically verified monitoring and research.			
Improving urban and industrial water quality				
WQA10	Review and set regionally relevant standards for urban and point-source discharges into the World Heritage Area and ensure licensees meet these standards.			

PL4 - Is the management plan effective in addressing the threats to the NATURAL VALUES and ecosystem services of the MPA (considering annexures 2a, 3, 4 and 5)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
Management of the MPA does little to safeguard the threatened natural values.	Poor (Score 2.5)	
Management is addressing a few of the threats and is safeguarding some of the threatened natural values.	Fair (Score 5)	
Management is addressing most of the threats and is safeguarding a large number of the threatened natural values.	Good (Score 7.5)	
Management is addressing all of the identified threats and is safeguarding all the identified natural values.	Very good (Score 10)	
Management is addressing the cumulative impacts of many of the identified threats and is safeguarding all the identified natural values.	Excellent (Score 12)	

PL5 - Have the requirements of habitat and species recovery been identified and documented?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
No recovery requirements for species or habitats identified.	Poor (Score 2.5)	
Programs of species/ habitat restoration have been planned in an *ad-hoc* manner.	Fair (Score 5)	
Restoration of prioritized species and/or habitats is planned and reviewed.	Good (Score 7.5)	
Restoration of prioritized species/ habitats is planned and reviewed through a comprehensive monitoring program.	Very good (Score 10)	

PL6 -Is the management effective in addressing the threats to the SOCIAL, ECONOMIC AND CULTURAL VALUES in the MPA (considering annexures 2b, 3, 4 and 5)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
The management does little to safeguard the threatened social, economic or cultural values.	Poor (Score 2.5)	
The management is addressing a few of the threats that are threatening the social, economic or cultural values.	Fair (Score 5)	
The management is addressing most of the threats that are threatening the social, economic or cultural values.	Good (Score 7.5)	
The management is addressing all the identified threats that are threatening the social, economic or cultural values.	Very good (Score 10)	
The management is addressing the cumulative impacts of many of the identified threats that are threatening the social, economic or cultural values.	Excellent (Score 12)	

5.4. PLANNING CRITERIA – methods are in place to effectively engage stakeholders and/ or the local community in planning

There is a wide range of ways in which stakeholders may be specifically engaged for planning tasks (for inputs into the preparation of a management plan or for specific operational interventions).

A wide range of methods and products may be utilized to engage stakeholders during a planning. Some of those utilized in the GBR are listed in **Case Example 4**.

For effective community engagement, it is important to first know and understand the stakeholders (as outlined in **Annexure 6** – Stakeholder mapping and analysis for each MPA) – once you know who are the key stakeholders and have some idea of how to successfully engage them , then you can tailor your products to most effectively reach them.

One of the key lessons from the GBR rezoning was that many people did not understand there was a problem and were therefore reluctant to accept the need for a solution (i.e., a new zoning plan). For example, many people did not understand the importance of non-reef habitats, particularly those between the coast and the mid-shelf coral reefs (*"Why is there a need for a 'no-take' area between the reef and the coast, when there isn't anything there"*).

To assist in promoting public understanding of the importance of all the habitats and the connectivity between them, publications such as *Crossing the Blue Highway* were used (Australian Coral Reef Society, 2000). This color poster provided a unique visual representation explaining the concept of 'connectivity', which was so important for the Representative Areas Program in the GBR and was an extremely useful educational tool for a wide range of stakeholders. A simplified version is available on the web at http://abc.net.au/science/bluehighway/.

Recognizing that different stakeholder groups have differing interests and views about the marine environment, communication messages need to be tailored appropriately. For example, elected representatives, the media and Indigenous communities should each be targeted with information specifically written and formatted for their needs (e.g., see **Annexure 14** for a specific leaders' guide).

Case Example 4

Some of the materials used in community participation phases for planning in the GBR

To facilitate and encourage community participation during the rezoning, the GBR MPA embarked on a public awareness campaign that went above and beyond that required by legislation: the consultation program was designed and conducted to reach a wide range of interest groups at local, national and international levels.

Item	Purpose	When produced
Introductory brochure	Mailed out to key stakeholders with a letter from the GBRMPA Chairperson at the start of the planning phase advising that the GBRMPA was reviewing the zoning of the Marine Park and how to get a submissions brochure.	Before planning commenced
Submissions	Available on the RAP website; but also sent out upon request. It included a questionnaire to focus the collating of information a part of the decision-making.	Once planning program commenced
Website	The website included virtually all the publicly available information and was highlighted on the GBRMPA homepage.	Once planning commenced; regularly updated during planning process
Leaders' Guide	Specifically developed to introduce representatives of peak bodies and politicians at local, state and federal levels to the rezoning.	Once planning program commenced
Bioregions map	Color map showing reef and non-reef bioregions of the GBR World Heritage Area. Used extensively for all public contact work.	Before planning commenced. Updated March 2001 on the basis of community feedback
Information sheets	Stand-alone information sheets covering a wide range of topics (e.g., how the Draft Zoning Plan affected a variety of activities or issues); also available on the Web	Before planning commenced and during program
Update brochures	Periodically released (six over the course of the planning program) to keep stakeholders informed of progress; also available on the RAP website.	Periodically during planning program
Frequently asked questions (FAQs)	On the basis of feedback from the informal consultation, answers to the most commonly asked questions from stakeholders were developed. These FAQs were made available at meetings and presentations and on the website	During planning program
Pie-chart maps	Color maps, available on the Web, showing the percentage of existing 'no-take' areas within reef and non-reef bioregions as pie-charts.	Before planning commenced
Advertisements in newspapers	Advised the general public that the GBRMPA was reviewing the zoning of the Marine Park and how to contact the GBRMPA.	During planning program
'Correcting the misinformation' fact sheet	To counter some of the misinformation in the community, the GBRMPA produced a fact sheet that explained the true situation about some key misconceptions of the community. This fact sheet was invaluable and was update as required.	During planning process when misinformation became apparent
TV/radio spots in regional centres	Advised the general public about the stage of the RAP process, including that the GBRMPA was reviewing the zoning of the Marine Park, the release of a Draft Zoning Plan and how to contact the GBRMPA (TV ad went to air two weeks prior to commencement of the formal community participation phase, regionally as a paid advertisement and nationally as a Community Service Announcement).	Once planning commenced; updated during planning process
Crossing the Blue Highway	This poster provided a unique visual representation of the 'connectivity' concept, which underpins the RAP, and was extremely useful as an educational tool for a wide range of stakeholders. Also available on the Web http://abc.net.au/science/bluehighway/	Before planning commenced

P17 - How involved are all the RELEVANT STAKEHOLDERS in planning in the MPA (considering annexures 1b and 6 and case examples 3 and 4)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
There is little, if any, opportunity for stakeholder participation in planning in the MPA.	Poor (Score 2.5)	
Some stakeholders participate in some planning within the MPA.	Fair (Score 5)	
Most stakeholders participate in most planning processes in the MPA.	Good (Score 7.5)	
All identified stakeholders routinely and systematically participate in all planning processes in the MPA.	Very good (Score 10)	
Stakeholders are well-represented in a sectoral advisory committee (and/ or geographic-based committees), which helps with routine planning in the MPA.	Excellent (Score 12)	

PL8 - How much CROSS-SECTORAL COORDINATION is there in planning in the MPA (considering annexures 1b and 6 and Case Example 3)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
There is little, if any, cross-sectoral coordination in planning in the MPA.	Poor (Score 2.5)	
Relevant sectors and agencies participate in cross-sectoral coordination in planning in the MPA.	Fair (Score 5)	
Most other sectors and agencies participate in cross-sectoral coordination in planning in the MPA.	Good (Score 7.5)	
All identified sectors and other agencies systematically participate in cross-sectoral coordination for any planning processes in the MPA.	Very good (Score 10)	
All sectors and other agencies are well-represented in a cross-sectoral advisory committee that is routinely involved in planning and reviewing in the MPA.	Excellent (Score 12)	

5.5. PLANNING CRITERIA– ensuring the management system is systematically reviewed and updated

Marine and coastal ecosystems are dynamic and changeable – these systems are not static and are constantly changing. Consequently, a plan prepared today, even if thoroughly undertaken, may become out-of-date in a year's time.

The most obvious changes that affect marine and coastal ecosystems include:

- increasing levels and types of use;
- other changing circumstances, whether they be:
  - technological,
  - social or cultural,
  - economic, or
  - political; and
- environmental and natural changes due to the dynamic nature of these ecosystems.

Any management regime of a MPA must be adaptable and be able to incorporate changes such as new information becoming available or circumstances changing. Irrespective of whether a change in marine or coastal management results from new data, 'in-the-field' experience or external circumstances, all management practices must be periodically reviewed and updated where appropriate.

An adaptive management approach enables managers to be flexible and to expect, and deal with, the unexpected. On the other hand, it is also important to recognize that some management actions need to be in place for a reasonable period of time to be effective or to enable a reasonable assessment of their effectiveness (for example, the legislation in the GBR did not stipulate a time period when the zoning needed to be reviewed; however, it did stipulate a minimum period that the zoning plan needed to remain unchanged in order to provide some certainty to users).

PL9 - Is the management planning system ROUTINELY AND SYSTEMATICALLY UPDATED (considering Annexure 8)?		
Assessment criteria	**Rating/ Score**	**Comments/justification**
No formal process in place for any systematic review and update of the Management Plan(s).	Poor (Score 2.5)	
The Management Plan(s) are routinely reviewed and updated.	Fair (Score 5)	
The Management Plan(s) are routinely and systematically reviewed and updated through an effective public participatory process.	Good (Score 7.5)	
The Management Plans are systematically reviewed (mid-term or every five years) through an effective public participatory process and are being scientifically updated.	Very good (Score 10)	

6. Developing a Better Understanding of 'Inputs'

Six questions (IN1 to IN6) help identify the key components within the important element of 'inputs:

6.1. INPUTS – adequate, secure and prioritized financial resources

Having sufficient financial resources on an ongoing basis is a fundamental requirement for the effective management of an MPA. Clearly unless there are adequate and secure financial resources, it is difficult to undertake effective management.

Most financial support for MPAs comes from the government (one level or another). However, some MPAs are also successful in obtaining additional funding from international donors or large NGOs or raising funds locally through fees or other aspects of 'user-pays'.

Annual budgets are usually divided into:

a. *Capital costs* – once-off (or start-up) capital costs for such assets as buildings, vessels and office and field equipment (including communications and GPS)

b. *Recurrent costs* – including recurring costs such as salaries, wages, staff benefits, insurance, office and vessel running costs and maintenance and project costs

c. An annual budget may sometimes also include a special one-off allocation to address a new government priority or project.

The management and funding of a physical asset like a vessel or an office needs to consider the 'whole life cycle' of that asset, including design, construction, commissioning, operation, maintenance, repair, modification, replacement and decommissioning or disposal.

Development of an annual business plan is a standard approach that aims to link expenditure to the key priority actions to ensure the values of the MPA are maintained or enhanced. Consequently, a prioritized list of management actions against specified time frames will help set a realistic budget to achieve the highest-priority tasks.

In addition to an annual business plan, a 3-year rolling program should forecast when additional costs like new assets or major maintenance costs are likely to occur (for example, replacement of outboard motors every 4-5 years or replacement of larger vessels every 10–15 years).

Each year both the annual business plan and the 3-year rolling program should be updated.

While some protected areas, like some national parks, have successfully implemented visitor entry fees, it is rarely easy in a MPA, especially if there is a multitude of access points or no effective way to collect the fees. The process for collecting fees may be so complex or unworkable that it may cost more to collect or enforce than the funds that are generated.

Another obstacle faced by government agencies in implementing revenue-generating mechanisms like user fees or public donations is that it is generally difficult to segregate such revenue for the MPA when government income is expected to be paid into a consolidated fund and allocated according to national priorities (Geoghegan 1998).

There are, however, ways that some costs in a MPA may be minimized. These include:

- Developing cost-sharing arrangements with other agencies to share expensive assets (e.g., boats, shared office facilities) or some costs (jointly chartering a vessel).
- Develop public-private partnerships to co-finance specific aspects of management – this may take the form of a donor paying for a specific asset (e.g. a new boat) or private sector companies subsidizing certain services (e.g. providing some services for minimal cost or assisting with site monitoring).

The aim of every MPA is to reduce their dependence on government funding if possible and move towards greater financial self-sufficiency. Geoghegan (1998) recommends, when developing revenue generation strategies for a MPA, starting by developing a desired budget for the MPA, creating a fund-raising strategy through a consultative approach with all major stakeholders, ensuring a diverse funding base with a year-on-year reduction of dependence on direct government support and optimizing partnerships and co-management agreements throughout to increase management efficiency and reduce costs.

Annexure 9 will help document the key financial items of the MPA.

IN1 - Are FINANCIAL RESOURCES linked to priority actions and are funds available when needed (considering annexures 3, 5 and 9)?		
Assessment criteria	**Rating/Score**	**Comments /justification**
Resource allocation is *ad hoc*, and funds are inadequate and seldom released in time and therefore not fully utilized.	Poor (Score 2.5)	
Some specific resource allocations made for management of priority actions. Funds are inadequate, and there is some delay in release, so only partially utilized.	Fair (Score 5)	
Some planning and prioritization enables the most important objectives to be resourced. Generally, funds are released with not much delay and are mostly utilized.	Good (Score 7.5)	
Comprehensive planning and allocation of resources enables the achievement of most objectives, particularly the priority ones. Funds generally released on-time and are mostly utilized.	Very good (Score 10)	
Comprehensive planning and allocation of resources enable virtually all the stated objectives to be effectively addressed. Funds released on-time and are fully utilized.	Excellent (Score 12)	

This assessment determines the extent to which the MPA has developed a solid financial structure that allows revenues, expenditures and investments to be managed in a transparent, timely and responsible manner, including the generation, management, implementation, and control of resources.

If a long term financial plan does not exist for the MPA, the managers need to initiate a process to prepare one, ideally when revising the management plan(s).

It is important to ensure that the staff understand that good financial management is a prerequisite for overall effective management of a MPA. This usually requires that a variety of funding sources be available, recognizing that problems can arise if a MPA relies on a single donor or financing mechanism.

Annexure 9 provides a checklist of the key line items that would usually appear in a sound financial system for a MPA.

Periodic audits should be conducted, and any resulting recommendations implemented as required. Also, be aware that some external donors may have special reporting requirements that will need to be followed.

Box 1 provides a checklist of the replacement schedules for capital items.

IN2 - How effective is the financial system in the MPA (considering Annexure 9)?		
Assessment criteria	**Rating/ Score**	**Comments/ justification**
There is very little in the way of a financial system in the MPA, and it is relatively ineffective for sound revenue management (i.e., generation, administration, implementation or control of resources).	Poor (Score 2.5)	
The MPA has a basic financial structure, which just meets the minimum requirements of administration, implementation and control of resources.	Fair (Score 5)	
There is a solid financial structure that contributes towards revenues, expenditures and investments being managed in a transparent and responsible manner and provides a basic replacement schedule for assets.	Good (Score 7.5)	
There is a sound and established financial structure that allows revenues, expenditures and investments to be managed in a transparent, timely and responsible manner, including generation, management and implementation, along with a sound maintenance/replacement schedule for the control of all resources.	Very good (Score 10)	

6.2. INPUTS – sufficient and appropriate CAPITAL ASSETS/ RESOURCES[6]

Managing physical MPA assets (such as patrolling vessels, diving equipment, buildings) should have the objective of providing the required level of service in the most cost-effective manner. Physical asset management should consider the 'whole life cycle' of an asset.

An obvious preference in a MPA is to have a reliable, safe, fit-for-purpose vessel or vessels that is/are well maintained and operational. However, sometimes vessel patrols for some tasks can be shared (such as with other governmental agencies or with the private sector). If vessels are owned by the MPA agency, a prioritized vessel replacement schedule should be part of the regularly reviewed 5-year rolling program.

Beyond a physical presence on the water, MPA managers should seek to augment their field capacity with the adoption of technology and advanced systems (such as global position systems, surveillance equipment and satellite monitoring), particularly where such technology helps capture and retain observations, heighten intelligence gathering and assist the efficient deployment of the MPA's physical assets. Such technology is likely to be most applicable for enhancing compliance and natural resource monitoring capabilities in an informed, contemporary and timely way at both remote and high-risk locations.

Marking no-anchoring areas or snorkelling areas or delineating boating channels is appropriately done using strategically placed markers or signs on the shore; simple buoys in the sea may also be utilized. However, where the placement of a buoy might be questioned from a legislative or enforcement perspective or is required in a high use area that is accessed at night, then the type of buoy, its placement and its visibility all become a lot more complex. Certainly, delineating park and zone boundaries using floating marker buoys is difficult to do in the ocean with certainty such that the placement would stand up in a court of law. Such buoys may initially be expensive, may be costly to maintain and are subject to theft, relocation and vandalism.

One of the most important aspects of a capital asset is a proper up-front assessment of the ongoing running costs, the maintenance costs and the replacement costs – too often, protected areas are provided with (say) a new patrol boat or geographic information system (GIS), but then do not have sufficient funding for regular use, let alone the necessary maintenance. Such expensive assets do need to be effectively and adequately financed in order to be cost-effective and useful.

Some 'best-practice' benchmark approximations for replacement are shown in the box "Replacement Schedule for Capital Items"

6 [Much of the following text is adapted from Day et al. (2015) 'Marine protected area management', in Worboys, Lockwood, Kothari, Feary and Pulsford (Eds) Protected Area Governance and Management, pp. 609–650, published 2015 by ANU Press, Australian National University, Canberra, Australia]

Box 1: Replacement Schedule for Capital Items

Asset	Description	Depreciable/Useful life:
Cars, mini vans, standard vans	Under 13,000 lbs. g.v.w.	4 years or 100,000 miles
Light trucks and 4WD	Light duty (under 13,000 lbs. g.v.w.),	4 years
Office furniture and fixtures	Desks, files, safes	10 years
Office equipment	Copiers, radios (digital/analog, 911, repeater, voice antenna, automatic vehicle locators), fax, phones	5 years
Computers	Laptops/desktops	3 years
Software	IT software *(often have their own upgrades)*	3 years
Associated IT equipment	High speed printers, mass storage units, data entry devices	6 years
Maintenance tools, equipment	Power/hand tools, lawn mowers, Whipper snippers, portable generator, grinders	5 years
Fixed maintenance equipment/other fixtures	Vehicle hoist/lift, pressure washer/steam cleaner, lathes, drill press, roller cabinets, compressor	12 years
Field equipment	Hand-held GPS, binoculars	4 years
Diving equipment	Regulators, buoyancy vests	Serviced every 1 year or 100 dive hours; replaced every 3 years or 300 dive hours
Small vessels	Dinghy or inflatable	5 years
Outboard motors		3 years
Large vessels	Usually with inboard motors and on-board equipment like chart plotter, radios	15-20 years

Some 'best-practice' benchmark approximations are[7]:

Annual Maintenance cost / Replacement asset value of the equipment **<3%**

Planned maintenance / Total maintenance **>85%**

(this means the unplanned or emergency maintenance is ~15%)

7 Source: Worboys and Winkler (2006)

IN3 - Are the CAPITAL RESOURCES (vessels, equipment, buildings, etc.) in the MPA adequate and well managed (considering annexures 3 and 5 and Box 1)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
Few, if any, capital resources have been explicitly allocated for MPA management.	Poor (Score 2.5)	
Some capital resources have been explicitly allocated for MPA management but not systematically linked to management objectives.	Fair (Score 5)	
Some capital resources have been explicitly allocated towards achieving some specific management objectives.	Good (Score 7.5)	
Adequate capital resources have been explicitly allocated and periodically replaced, enabling the achievement of a number of the specific management objectives.	Very good (Score 10)	
The MPA is well-resourced with sufficient capital resources that are regularly maintained and periodically replaced, enabling all the specific management objectives to be achieved.	Excellent (Score 12)	

IN 4 - Are a systematic maintenance schedule and funds in place for management of infrastructure/assets (considering Box 1)?		
Assessment criteria	**Rating/ Score**	**Comments/ justification**
No systematic inventory or maintenance schedule exists.	Poor (Score 2.5)	
The inventory maintenance is *ad-hoc,* and so is the maintenance schedule.	Fair (Score 5)	
A systematic inventory provides the basis for a maintenance schedule, but inadequate funds are made available.	Good (Score 7.5)	
A systematic inventory provides the basis for a regular maintenance schedule, and adequate funds are made available for such maintenance.	Very good (Score 10)	

6.3. INPUTS criteria– adequate and competent personnel are available for managing the MPA

A qualified, competent and committed staff is central to the success of any MPA. Therefore, staff training – based on their specific competency needs- is a vital component of efficient MPA management and should be considered a priority in all states, training Institutions and MPAs. Identifying competency needs should precede any training initiative.

Adequate numbers of competent personnel are required to perform a wide variety of functions while managing an MPA, and this is the most important input to an MPA. Managing an MPA requires special competencies, such as an understanding of the biological and physical elements of the marine, coastal and island ecosystems; skills to assess and monitor the biodiversity resources in the MPA; and the ability to engage effectively with local communities and other key stakeholders and sectors in the coastal and marine context. Its not just a matter of allocating staff members from a terrestrial national park and assuming they will be able to deal with the multitude of issues facing them in a very different environment.

Competence or competency is the proven ability to do a job, defined in terms of the combination of required knowledge, skills and attitude/values. Knowledge provides an awareness and understanding of the conceptual and technical basis for the tasks to be performed as part of one's job. Skills ensure the ability to perform those tasks efficiently, reliably and consistently. Attitude and values help ensure than one remains motivated and result-oriented and completes the tasks professionally and ethically. These are also referred to as 'soft skills'.

The competencies table in Box 2 shows the wide variety of skills different members of the workforce in a MPA might need, whether they are front-line staff or the Park Director. This competencies table is based on the recent publications on capacity needs assessment for coastal and marine protected areas in India.[8,9]

It is very important to assess the existing competencies of the MPA staff and then identify the required capacity development inputs, i.e., training measures, on-the-job coaching and mentoring, field expeditions, peer-learning groups, etc. The recommended annual expenditure on staff training (as a percentage of the overall payroll) is around 4 percent (~4%).

8 Neeraj Khera, V. B. Mathur , K. Sivakumar, Yugraj Yadava, Darryl D'Monte , S. Gopikrishna Warrier, Sanjay Dave, Rajdeep Mukherjee and Vasanthi Hariprakash. 2014. Capacity Needs Assessment for Sustainable Management of Coastal and Marine Protected Areas in India: using a participatory approach. CMPA Technical Series No. 37. Indo-German Biodiversity Programme, GIZ- India, New Delhi. Pp 50. http://indo-germanbiodiversity.com/pdf/publication/publication22-11-2017-1511331630.pdf

9 V. B. Mathur, K. Sivakumar, J. A. Johnson, G. V. Gopi, S. Prakash, Deepak Apte, Suvarna Raju 2014. Capacity Needs Assessment for participatory management of coastal and marine protected areas in India with special reference to Forest Sector and Youth: Situation and Conceptual Analysis. CMPA Technical Series No. 39. Indo-German Biodiversity Programme, GIZ- India, New Delhi. Pp 137. http://indo-germanbiodiversity.com/pdf/publication/publication22-11-2017-1511331694.pdf

Box 2: Competencies Table vis-à-vis Coastal and Marine Biodiversity Conservation

Technical / professional competencies
Understanding of coastal and marine biodiversity basic science, knowledge of key developments in the domain of coastal and marine biodiversity
Understanding of legal framework vis-á-vis coastal ecosystems and enforcement requirements
Understanding of the socio-economic contexts of the coastal ecosystems
Ability to design awareness and education programs
Research and monitoring skills- include planning, implementation, and valuation of assessment and monitoring of required elements of biodiversity including coastal habitats, under-water surveys, identification of suitable indicators, etc
Use of technology
Management and methodological competencies
Protected area policy, planning and projects
Human resource management
Financial and operational resource management
Administrative documentation and reporting
Personal and social competencies
Communication and facilitation skills
Decision-making skills, negotiation skills, conflict management skills, diplomatic sensitivity, trustworthiness/ethics, strategic thinking, strategic networking
Leadership competencies
Result-orientation, problem solving skills
Team work and team leadership, skills to engage with stakeholders from other sectors and local coastal communities

Implementing annexures 10a and 10b for competencies assessment

Annexures 10a and 10b provide formats to assess the individual competencies of key MPA field-level staff members (RFOs, Foresters, Forest Guards) and senior managerial staff members (DFOs and above). The MPA manager/ MEE assessor should first record the individual score of relevance and existing level in columns 1 and 2 for each of the relevant staff members of the MPA. The relevance can be decided on the basis of the specific job profile of the MPA staff member (e.g., a Forester would have a very high relevance to the diving skills, whereas a CCF might have low relevance to the diving skills). The existing level can be assessed from the formal or informal qualification (for the knowledge and skills-related competence), while the level of competencies for the values and attitude would need to be judged by the assessor on the basis of the results of the self-assessment by the individuals. The product of relevance and competence level score would then provide priority scores for each competency. Annexure 10a would, therefore, provide the prioritized list of key competencies that the field-level staff of a particular MPA must have. Any form of capacity development measures implemented for the MPA staff must conform to this prioritized list of competencies.

IN5 - Are there an adequate number of staff members who are competent to manage the MPA (considering annexures 10a and 10b)?		
Scoring criteria	**Score**	**Comments/ justification**
An inadequate staff has been allocated for the MPA, and the staff members do not possess the required competencies for managing an MPA.	Poor (Score 2.5)	
An inadequate staff has been allocated, but the staff members possess a medium level of competencies for managing an MPA.	Fair (Score 5)	
An adequate staff, with a high level of competencies, has been allocated for the MPA.	Good (Score 7.5)	
An adequate number of extremely competent staff members has been explicitly allocated to achieve all the stated management objectives of the MPA.	Very good (Score 10)	

6.4. INPUTS – sufficient and appropriate biophysical information

A good starting point to determine what should be sought is the checklist at **annexures 1a** and **2a**. Annexure **2a** will provide a good indication of the key values for which information should be collated and will also help identify key information gaps.

Recognizing the downstream impacts of adjacent land areas, it is also worthwhile collecting biophysical information for adjoining areas outside the MPA (at least the adjacent coastal areas, if not the entire catchment(s) adjoining the MPA).

Even if it seems that information about the MPA seems scarce, there are likely to be various sources of information. For example, hydrographic charts showing basic depth contours are readily available and can help identify features of ecological significance.

The Internet has vast resources (e.g., http://www.naturalearthdata.com/downloads/ has 1:50M rasters of the ocean bottom at http://www.naturalearthdata.com/downloads/50m-raster-data/, and all these data are in the public domain, and so there are no problems about licenses). Similarly, information about ocean currents and key habitats for key species can be gleaned from the Web.

There is considerable information specifically about coastal marine resources in India. For example, K. Sivakumar and others from the Wildlife Institute of India have surveyed in detail the coastal and marine ecosystems of peninsular India to identify and prioritize the 'Important Coastal and Marine Biodiversity Areas (ICMBA)' for improved management. Using standardized approaches, information collected from 350 sites and a matrix of 26 goals spread over 6 criteria was prepared to identify ICMBA sites around India.

Various other documents have collated information about marine and coastal species and habitats elsewhere in the world that might also prove useful for Indian MPAs. The DVD contains such documents in a folder on 'Further resources'.

A word of caution for managers: Don't wait to collate 'all the necessary information' before commencing a major planning exercise or a major project. It is far better to work with the best available information and to add in additional information if/ when it is available, than to wait in vain for 'perfect data' (if you do wait for perfect data, then it's likely you will never start planning, so start and adaptively plan and adaptively manage as you proceed).

IN6 - Is there adequate BIOPHYSICAL INFORMATION available for effective management of the MPA (considering annexures 1a, 2a, and 3)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
There is very little or no biophysical information available which is relevant for the management of the MPA.	Poor (Score 2.5)	
There is some biophysical information but it is neither up to date nor spatially widespread throughout the MPA.	Fair (Score 5)	
There is reasonable biophysical information available in some areas but it is patchy and variable in its timeliness.	Good (Score 7.5)	
There is good and spatially-comprehensive biophysical information available throughout the MPA but some of it is dated.	Very good (Score 10)	
Spatially comprehensive biophysical information is readily available throughout the MPA and it is regularly updated.	Excellent (Score 12)	

6.5. INPUTS – sufficient and appropriate socio-economic information

In the vast majority of MPAs in India, people are an integral part of the area. Effective management of a MPA therefore requires more than just a comprehensive understanding of the biophysical values and pressures, or the current state of the ecosystem. Understanding the 'human dimension' of the MPA and the surrounding context is essential for long-term planning and management, and for monitoring and evaluation.

The 'human dimension' includes how people, industries and communities perceive, interact with, and value the MPA, and how these groups are likely to respond to and cope with changes associated with environmental degradation, management changes and regulatory frameworks.

Managers of MPAs should therefore be using social and economic data to assist them in their day-to-day duties; having such data can directly enhance the management of their MPA and give decision-makers a far more holistic understanding of the social and economic values of the MPA both in itself but also compared with the surrounding context (say within the region or the state). Monitoring of the socio-economic conditions around the MPA can help evaluate the effectiveness of management interventions and assess equity dimensions within the MPA.

Various other documents have collated information about social and economic aspects elsewhere in the world that might also prove useful for Indian MPAs. The DVD contains such documents in a folder on 'Further resources'.

IN7 - Is SOCIO-ECONOMIC INFORMATION available for effective management of the MPA (considering annexures 1b, 2b, 3, 6 and 7)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
There is very little or no socio-economic information available that is relevant for the management of the MPA.	Poor (Score 2.5)	
There is some socio-economic information, but it is neither up to date nor spatially widespread throughout the MPA.	Fair (Score 5)	
There is reasonable socio-economic information available in some areas, but it is patchy and variable in its timeliness.	Good (Score 7.5)	
There is good and spatially-comprehensive socio-economic information available from throughout the MPA, but some of it is dated.	Very good (Score 10)	
Spatially comprehensive socio-economic information is readily available from all over the MPA and is regularly updated, and it shows the economic benefits of the MPA.	Excellent (Score 12)	

Social and Economic Long Term Monitoring Program (SELTMP)

Case Example 5

In the GBR, a Social and Economic Long Term Monitoring Program (SELTMP) was established in 2011 and is gathering long-term data specific to GBR users, coastal communities, marine tourism, commercial fishing, recreational fishing, Indigenous communities and shipping. SELTMP is led by researchers from CSIRO and James Cook University, in partnership with the Great Barrier Reef Marine Park Authority, the GBR Foundation and NQ Dry Tropics.

SELTMP is already providing new insights into relationships between people and the iconic GBR by conducting large-scale surveys of user groups and residents. The first of these surveys, in 2013, questioned 8300 people (commercial fishers, tourism operators, tourists and coastal and national residents) about their dependence, usage and affinity with the GBR, as well as their perceptions, values, experiences, attitudes and behaviors.

6.6. INPUTS – non-government inputs (e.g., local communities, volunteers, universities, NGOs, traditional/indigenous knowledge) that help to address specific management actions

A wide range of institutions and individuals can play a direct, significant and specific role in helping to effectively manage a MPA. The reasons for this may originate from a historical association, dependence for livelihood, geographical proximity or economic interest or a variety of other reasons (McNeely et al, 2006). Such stakeholders may include:

- Individuals, families and households who have a long-standing association with the area (e.g., fishworkers within or around the MPA)
- Local traditional authorities (such as village councils of elders or traditional chiefs)
- Community-based groups, self-help groups, Biodiversity Management Committees, local disaster management committees
- Political authorities prescribed by law (e.g., elected representatives at the village, district or municipality level), Panchayats
- NGOs or volunteers dedicated to conservation or to the environment at the local, national or international level;
- Businesses and commercial enterprises who may make a commercial gain from the area (and some may be keen to promote a positive corporate image of being ‘green’)

- Collectives like chambers of commerce or industry associations
- Universities and research organizations
- Other agencies with an interest in the area (at the local, municipal, provincial, state or national level)

These stakeholders have their own specific reasons for being interested in the management of the MPA. They often possess specific skills, knowledge and networks that the managers themselves do not have. This gives another reason to an MPA manager to get them effectively involved. For reasons of dependence and social justice, it is imperative to encourage the inclusion of traditional owners and local communities as far as is possible is - we must therefore recognize that local knowledge is equally important for decision-making as scientific understanding.

Research undertaken by universities or research institutes can provide managers with important information on a range of biophysical and socio-economic matters. Much research, however, is carried out on topics of greatest interest to the researchers themselves and so managers need to proactively and clearly define their management questions and their key information gaps.

It is also important that any research that is carried out does not significantly disrupt the natural values or processes for which the MPA was declared and so all research in a protected area should need prior approval on the basis of a clear research plan stipulating what is proposed to be done where, when and how. Among the various research conditions attached to a research permit must be the requirement to submit copies of progress and final research reports with the MPA.

Getting a wider group of users involved in periodic monitoring of the MPA can be a cost-effective way of obtaining regular monitoring data.

Voluntary community-based committees can play an important role and provide a two-way conduit for input to managers but also to disseminate key messages from managers back into the community. In the Great Barrier Reef Marine Park, these are called Local Marine Advisory Committees. There are 12 such committees at major population centers along the GBR Coast, providing a community forum for interest groups, the government and the community to collectively discuss issues around marine resources.

IN8 - What resources are available from key stakeholders for implementing the MPA management plan (considering Annexure 8)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
There are few civil society resources available to assist with the management of the CPMA.	Poor (Score 2.5)	
There are some civil society resources, but they are not spatially widespread nor readily offered.	Fair (Score 5)	
There is a range of civil society resources potentially available, but only some of it is readily offered	Good (Score 7.5)	
There is a very wide range of civil society resources and expertise readily offered for the achievement of specific management objectives.	Very good (Score 10)	
There is a very wide range of civil society resources and expertise, and these are regularly utilized by the management of the MPA to achieve all the key management objectives.	Excellent (Score 12)	

Case Example 6

Eye on the Reef: a reef monitoring and assessment program

In the Great Barrier Reef, a program called the *Eye on the Reef* is a reef monitoring and assessment program coordinated by the managing agency. This enables anyone who visits the GBR to contribute to its long-term protection by collecting valuable information about reef health, marine animals and incidents. All types of users and visitors (from day visitors, tourists, fishers, Marine Park Rangers and marine tourism staff members right through to marine scientists) are encouraged to report their observations to this program.

One way is to download the Eye on the Reef app and share photos of what you have seen out on the reef. This can be anything from wildlife (including protected species) to pests like the crown-of-thorns starfish or marine pollution, to special events like fish spawning. This app will help identify the wildlife as well as share your Eye on the Reef sighting photos on social media.

All information collected through the Eye on the Reef program is combined in a single data management and reporting system (Eye on the Reef Survey Activity map - see http://www.gbrmpa.gov.au/visit-the-reef/eye-on-the-reef). This data can provide park managers and researchers with up-to-date information on reef health status and trends, the distribution of protected and iconic species and early warnings of environmental impacts.

7. Developing a Better Understanding of 'Processes'

Six questions (PR1 to PR6, below) help identify the key components within the important element of 'process':

7.1. PROCESSES – key priority issues effectively managed across key sectors and stakeholders working in and affecting the MPA

Sound governance arrangements are fundamental for effective and integrated management and, if done effectively, can facilitate integrated input from a range of relevant stakeholders. Governance can be defined as *'the involvement of a wide range of institutions and actors in the production of policy outcomes … involving coordination through networks and partnerships'* (Johnston et al. 2000: 317).

Governance systems can be broadly separated into three general approaches: top down, bottom up and governance based on market incentives. The 'top-down' approach emphasizes government-led governance from 'above', through the establishment of laws and other regulatory mechanisms that implement and enforce biodiversity conservation. The 'bottom-up' approach focuses on decentralizing decision-making processes from government to incorporate local community-based approaches, often with a focus on harnessing local or traditional knowledge bases. A system that integrates both top-down and bottom-up governance has been shown to be the most effective. Co-management has the potential to incorporate a diverse range of stakeholders and knowledge in decision making processes to improve effective governance. This requires a balanced approach that maintains and incorporates the cultural values, customs and knowledge of traditional communities living within and adjacent to the MPA.

If properly understood and adopted, co-management can lead towards more effective and transparent sharing of decision-making powers, a more active, conservation-friendly and central role for Indigenous and local communities in MPA management and better synergy of the conservation capacities of different stakeholders.

The following committees might help achieve good governance in a MPA:

- A multi-sectoral *Advisory Committee* to facilitate engagement with the key users, including fish workers and other local community representatives**
- An *Independent Scientific Panel* to provide expert advice on objectives and targets, knowledge gaps and science priorities for effective delivery. This panel should include members with biophysical, heritage, social and economic expertise**.
- A *Cross-sectoral Committee* of senior officials from the key State Government agencies and Line Departments to facilitate coordination of MPA-related activities.

***In the case of the Advisory Committee and the Independent Scientific Panel, there is usually a secretariat provided by the main MPA managing agency.*

PR1 - Are all high-priority issues effectively managed across key SECTORS and stakeholders (considering annexures 5, 6, 8 and 11)?		
Assessment criteria	**Rating/ Score**	**Comments/ justification**
The MPA has little or no consultation with the other sectors/ stakeholders in the region who have a direct or indirect influence on the threats or issues likely to impact the MPA.	Poor (Score 2.5)	
The MPA has consulted, in an opportunistic way, with the other sectors/stakeholders in the region who have a direct or indirect impact upon the threats or issues likely to impact the MPA.	Fair (Score 5)	
The MPA has systematically consulted with the other sectors and stakeholders in the region and considered their plans for the key threats or issues likely to have a direct or indirect impact upon the MPA.	Good (Score 7.5)	
The MPA has comprehensively and systematically consulted with the other sectors and stakeholders, and considered their plans for all known threats or issues likely to have a direct or indirect impact upon the MPA.	Very good (Score 10)	

7.2. PROCESSES – Is there effective performance monitoring to gauge progress towards achieving the objective(s)?

There are a number of reasons why people and organizations wish to monitor their performance. Hockings *et al* (2015) explain that such evaluations can:

- facilitate an adaptive approach by providing essential information to managers at all levels about the extent to which management interventions are being implemented and are successful;
- assist in effective resource allocation by indicating gaps and areas of highest need and likelihood of success— and facilitating prioritization where resources are scarce;
- promote accountability and transparency through providing senior management, funding bodies, stakeholder groups and the public with information about how resources are being used and decisions are made; and
- involve the community, build a constituency to support MPAs and promote the values at a particular site or more generally across a system of protected areas.

As well as these substantive benefits, the process of assessing management effectiveness can itself provide a number of procedural benefits such as improved communication and cooperation between managers and other stakeholders. Many managers have commented that the major benefits to them have come during the

assessment process rather than from any formal report – such a process provides an opportunity to reflect on the challenges faced in managing a site and systems from a different perspective, away from the day-to-day concerns of management.

Monitoring performance is most useful as a tool if it is repeated at regular intervals because this gives better information on trends and shows if management changes are improving the conditions at the site. When MPAs are in an establishment or strengthening phase or under a particular threat, yearly assessments may be necessary, but usually two- to five-year intervals are adequate to reveal changes and guide management.

PR2 - What is the level of monitoring and assessment in the MPA (considering annexures 12a, 12, and 12c)?		
Assessment criteria	**Rating/ Score**	**Comments/justification**
Progress against the objectives of the MPA is rarely monitored AND no assessment of effectiveness has ever occurred or been reported.	Poor (Score 2.5)	
There is some *ad hoc* monitoring, and progress against at least one of the objectives of the MPA has been monitored and/or publicly reported.	Fair (Score 5)	
There is an agreed and implemented monitoring program, and progress against some of the objectives of the MPA is objectively monitored periodically, with the results publicly available and/or used in adaptive management.	Good (Score 7.5)	
A good monitoring and evaluation system exists, with progress against most, if not all, of the objectives of the MPA being monitored regularly and objectively, with the results being widely disseminated and used in adaptive management.	Very good (Score 10)	
There is a comprehensive, integrated program of monitoring and regular assessment that is relevant to the management objectives and is undertaken regularly and used in adaptive management.	Excellent (Score 12)	

7.3. PROCESSES- Are appropriate capacity development measures being made available to the MPA staff?

Capacity development is a process that enables individuals, organizations and societies as a whole to shape their own development sustainably and adapt to changing conditions.

The success of conservation projects depends not only on the political will and finances but also largely on the people managing the conservation projects and protected areas. Since management of protected areas, especially MPAs, involves 'people management' as one of the dominant elements, it is imperative that the training of the managers also include a focus on global competencies that are beyond the technical knowledge and skills of conservation issues. Leadership skills, networking and communication skills, negotiation and conflict resolutions skills and interdisciplinary skills for multi-stakeholder participation are some of the key competence areas. IUCN also defines such competencies as "Universal Work Competencies" that anybody working in a protected area should possess, whether the director or a local volunteer.

Competencies-based training programs are a way of approaching professional training that place the primary emphasis on facilitating the participants in further developing their competencies, which are required to enable them to perform their jobs more efficiently and effectively. It aims at preparing people more effectively for real workplaces.

An ideal training/ course for MPA staff/ officials should be developed after a thorough capacity needs assessment process. The course should intend to enable participants in developing a sound understanding of the concepts and issues related to managing coastal and marine biodiversity, coastal and marine protected areas, the ecological and socio-political context, conservation approaches and legal-policy frameworks of terrestrial and coastal–marine protected areas as well as equip them with the skills needed to conduct assessments and monitoring of coastal and marine habitats and species, prepare field reports and develop operational plans (under supervision) for MPAs on the basis of management effectiveness guidelines.

The training must use a mix of field-based and classroom training sessions, in almost equal proportions, to facilitate the participants to apply theoretical information learnt in classroom sessions in field conditions and to absorb the experience of local ecological and human communities. The training should use participatory training methods for classroom sessions and field exercises (Khera et. al 2015[10]; Khera et al 2017[11]).

10 Neeraj Khera, K. Sivakumar, Sarang Kulkarni and Pradeep Mehta. 2015. Trainer's Guide on Coastal and Marine Biodiversity Conservation and Protected Area Management for Field-Level MPA Managers: Using participatory training methods. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) India and the Wildlife Institute of India. ISBN 978-81-933282-2-4. Pp 190

11 Neeraj Khera, Pradeep Mehta and Senthil Kumar. 2017. Facilitator's Guide: Training Expedition on Coastal and Marine Biodiversity and Protected Area Management for IFS Probationers. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) India and the Indira Gandhi National Forest Academy (IGNFA). ISBN 978-81-935619-0-4. Pp 152

PR3 – Are appropriate capacity development measures being made available to the MPA staff (considering the extreme right columns of annexures 10a and 10b)?		
Assessment criteria	**Rating/ Score**	**Comments/ justification**
The officers or frontline staff in the MPA are trained in the priority competencies, only in an adhoc manner.	Poor (Score 2.5)	
A few of the officers or members of the frontline staff in the MPA are regularly trained, but the training programs do not address the competencies required for effective MPA management.	Fair (Score 5)	
Moe than 75% of the officers or frontline staff in the MPA are regularly trained on most of the competencies required for effective MPA management.	Good (Score 7.5)	
100% of the officers or frontline staff in the MPA are trained on most of the competencies required for effective MPA management.	Very good (Score 10)	
The MPA has a system of assessing the capacity needs of the staff and officers on a regular basis and sending them for the required training or organizing special training programs and carrying out other capacity development measures to fill the identified capacity gaps.	Excellent (Score 12)	Bonus score

7.4. PROCESSES – Is there a procedure available to resolve differing views/conflicts regarding management issues?

Inevitably there will be conflicts between users or differing views about appropriate management regimes in an MPA. When such differences occur, it helps if there is a clear and established process to resolve them.

Lewis (1996) notes that staff members may find themselves occupying a variety of roles in conflicts that affect their MPAs: they may be mediators, negotiators, convenors, experts, advocates or decision-makers. Often, they will find themselves in more than one of these roles at once. Regardless of the roles MPA staff occupy at any particular time, they can be critical players in conflicts and are often in a position to help find a resolution.

Any conflict management approach must be appropriate for the context in which it happens and must take local conflict resolution customs and institutions into account. Nevertheless, Lewis (1996) highlights three general principles that should be applicable to the majority of protected area conflicts.

- Principle One - Focus on Underlying Interests.
- Principle Two - Involve All Significantly Affected Stakeholders in a Fair and Respectful Process.
- Principle Three - Understand the Power that Various Stakeholders Have, and Take that into Account when Trying to Resolve a Conflict.

Lewis (1996) also has case studies and many useful suggestions for dealing with conflicts, including:

- Dealing with large numbers of stakeholders
- Building trust and confidence-building measures
- Dealing with important stakeholders who do not want to participate in the conflict resolution process
- Involving less powerful stakeholders
- Reaching a satisfactory resolution

Process of conflict resolution in management plan for Belize

Case Example 7

The appendix in the draft management plan for Belize outlines a process for conflict resolution; it includes such guidance as:

- Do not concentrate on differences but rather on points of convergence.
- Make brief summaries of what you hear the speaker saying every so often.
- Emphasize and enlarge achievements and agreements even though they appear to be simple.
- Establish the point or points of interest of each party.
- Determine a methodology to follow.
- Build scenarios and alternatives as far as possible.
- Make an effort to listen to the speaker before listening to yourself.
- Give credit to all parties.
- When you get stuck, take a break or change the subject.
- Make a list of possible solutions with an analysis of advantages and disadvantages.
- Determine the best solution and get commitment from all parties to implement it.

PR4 - Has there been adequate COMMUNITY ENGAGEMENT for effective MPA management (considering annexure 6)?		
Assessment criteria	**Rating/Score**	**Comments/justification**
There is no planned community engagement program relevant to the management of the MPA.	Poor (Score 2.5)	
There is an *ad hoc* community engagement program relevant to the effective management of the MPA.	Fair (Score 5)	
There is a program for community engagement, but it only partly addresses the effective management of the MPA.	Good (Score 7.5)	
There is an appropriately funded program for community engagement that is relevant to the effective management of the MPA.	Very good (Score 10)	
There is an appropriately funded and regularly reviewed program of community engagement that also demonstrates some of the benefits of effective management of the MPA.	Excellent (Score 12)	

PR5 - What is the level of compliance occurring in your MPA (considering annexures 7, 8 and 12)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
Less than 25% of all your MPA users are aware of, understand and comply with the rules/regulations.	Poor (Score 2.5)	
Realistic estimates indicate that between 25% and 50% of all your MPA users are aware of, understand and comply with the rules/regulations.	Fair (Score 5)	
Realistic estimates indicate that between 50% and 75% of all your MPA users are aware of, understand and comply with the rules/regulations.	Good (Score 7.5)	
A comprehensive survey and other effective assessment methods demonstrate that virtually all MPA users and stakeholders are aware of, understand and comply with the rules/regulations.	Very good (Score 10)	

PR6 - Is there a responsive system for handling COMPLAINTS AND CONFLICTS about MPA management?		
Assessment criteria	**Rating/ Score**	**Comments/ justification**
No systematic or responsive system exists for handling complaints or conflicts.	Poor (Score 2.5)	
A system for handling complaints exists, but it is not responsive to individual issues, and usually there is limited follow-up.	Fair (Score 5)	
A coordinated system for handling complaints exists that logs and responds effectively to most complaints/conflicts.	Good (Score 7.5)	
All complaints/conflicts are systematically logged in a coordinated system, and a timely response is provided leading, to minimal repeat complaints.	Very good (Score 10)	

7.5. PROCESSES – Is there a process to ensure that cumulative impacts of threats are appropriately considered?

Cumulative impacts occur when different impacts combine or exacerbate each other so that the cumulative impacts may be far greater than any individual impact. Cumulative effects may arise from multiple pressures, such as a bay receiving nutrients from both direct point-source discharges (for example, sewage) and diffuse agricultural run-off. Alternatively, it may be the same pressure that is repeatedly affecting a feature over time, such as seabed features exposed to episodic fishing (such as trawling with bottom-towed gear), or different pressures arising from the same development acting cumulatively on one feature—for example, development of infrastructure on intertidal mudflats leading to habitat loss (footprint) and disturbance (through increased use of vessels).

When addressing cumulative impacts, it is important to also consider any direct or indirect legacy impacts (i.e., impacts from activities that occurred long ago but that are still having severe and long-lasting impacts on the values of the MPA). Examples of legacy impacts that no longer occur in the GBR but that today still affect its values include commercial harvesting of dugongs, green turtles, crocodiles and whales, collecting pearl shells and trochus shells and unsustainable activities on the reefs and in the adjoining catchments (broad-scale land clearing, changes to natural water flows, etc.). Today many of these legacies still are causing impacts, substantially affecting the ability of some species to recover from more recent impacts, including climate change and unsustainable fishing.

Cumulative impacts have important consequences for MPA management, including the need to manage as many impacts as possible so as to reduce cumulative effects and the recognition that reductions in one impact may reduce the effects of other impacts, thus increasing the 'resilience' of the ecosystem to cope with other less manageable impacts such as those caused by climate change.

Cumulative impact assessment (CIA) focuses on the receiving environment - the receptors. It considers, for each relevant receptor, the impacts of the proposed action, together with other past, present and future actions to determine the cumulative impacts.

While there is widespread recognition of the need to manage cumulative effects and there are a number of guidance documents on approaches and methodologies, it is proving difficult to make practical progress, even in well-established and well-researched MPAs.

PR7 - What is the level of RESEARCH being conducted relevant to effective management of the MPA (considering annexures 12b and 12c)?		
Assessment criteria	**Rating/ Score**	**Comments/ justification**
There is little or no scientific, social or economic research to support planning and management, or the available information is not used for decision-making.	Poor (Score 2.5)	
There is limited scientific, social or economic research to support planning and management, but it is rarely used for decision-making.	Fair (Score 5)	
There is some scientific, social and economic research to support planning and management, and whatever is available is used for decision-making.	Good (Score 7.5)	
All available scientific, social and economic research is used to support planning and management, and it is regularly used for effective decision-making.	Very good (Score 10)	
All available scientific, social and economic research is used and regularly updated to support planning and management in the MPA, and there is an ability to incorporate new information into subsequent planning or ongoing management tasks.	Excellent (Score 12)	

PR8 - Have the CUMULATIVE IMPACTS affecting the MPA been identified and prioritized (considering annexures 12b and 12c)?		
Assessment criteria	**Rating/ Score**	**Comments/ justification**
There is little or no understanding, or consideration, of cumulative impacts when undertaking planning or management.	Poor (Score 2.5)	
There is an understanding of cumulative impacts, but it is rarely considered when decision-making occurs for planning or management.	Fair (Score 5)	
There is some consideration of cumulative impacts when planning and managing the MPA, and it is a component of MPA decision-making.	Good (Score 7.5)	
All available information including direct, indirect and cumulative impacts are considered when planning and managing the MPA, and this is regularly used for effective decision-making in the MPA.	Very good (Score 10)	

8. Developing a Better Understanding of 'Outputs'

It is important to recognize that:

- **Outputs** are the goods and/or services that are produced during the management cycle as a result of management actions.
- **Outcomes,** on the other hand, are the effects of management and may be a mixture of process, products and behavioral change and may not be obvious for years....

Five questions (OP1 to OP5 below) help identify the key components within the important element of 'outputs':

8.1. OUTPUTS – What outputs have been produced that address the key priority issues or ensure the values of the MPA are protected

This component aims to asses which planning and/or strategic documents have been produced that aim to ensure the values of the MPA identified in CO1 are protected and that address the key priority issues identified in CO3. Two annexures help determine what documents exist and whether those documents are focussed on the highest priority pressures.

Annexure 11 is a matrix designed to determine which management documents are addressing the key priority issues. It relies on key information collated in **two previous annexures:**

- Key information from **Annexure 8** (a list of all the management tools that exist for the MPA, the extent of the area that each of those document covers and the date each document was enacted).
- That information needs to then be crossed-referenced with the priority threats assessed in **Annexure 5** to determine whether the highest priorities are being addressed and in which management documents.

Unless these high priority matters are being effectively addressed in publicly available management documents, the managers have little basis to focus their efforts where it is probably needed most or to argue for more resources.

OP1 – Is there a protection system in place to control resource use and/or access in the MPA (considering annexures 5, 8, 11 and 12a)?		
Assessment criteria	**Rating/ Score**	**Comments/ justification**
Protection systems (e.g., patrols, permits) do not exist or are not effective in managing access or resource use.	Poor (Score 2.5)	
Protection systems (e.g., patrols, permits) exist but are only partially effective in managing access or resource use.	Fair (Score 5)	
Protection systems (e.g., patrols, permits) are moderately effective in managing access or resource use.	Good (Score 7.5)	
Protection systems (e.g., patrols, permits) are largely or wholly effective in managing access or resource use.	Very good (Score 10)	
There is an integrated protection system in place that is widely understood by stakeholders with a high level of compliance and that has proven effective in managing both access and resource use.	Excellent (Score 12)	

8.2. OUTPUTS – To what extent have the actual management activities in the MPA over the past 3-5 years achieved the stated management objectives in any management planning documents produced for the site?

Background

This is an extension of OP1 and seeks to determine the extent to which management activities have been implemented over the past 3 years, and whether they have addressed the stated management objectives in any planning documents relevant to the MPA.

Annexure 12a is a Template that seeks to document implementation over the past 3 years under three separate headings:

1. Management actions already completed
2. Progress on actions that are expected to be completed within the next 12 months
3. Progress on 'ongoing' management actions that will continually be delivered through ongoing management programs.

All planning and/or strategic documents for the MPA should be publicly available, have clear management objectives and be systematically reviewed and periodically updated *(this was also addressed in Component 5 of PLANNING)*.

OP2 - How much information about the MPA management is publicly available (considering annexures 6 and 12a[12])?		
Assessment criteria	**Rating/ Score**	**Comments/justification**
Little or no information on the management of the MPA is publicly available.	Poor (Score 2.5)	
The publicly available information is general and has limited relevance to management accountability and the condition of public assets.	Fair (Score 5)	
The publicly available information provides detailed insights into major management issues of the MPA.	Good (Score 7.5)	
Comprehensive reports are routinely provided on the management and condition of resources in the MPA	Very good (Score 10)	

OP3 - How many of the prioritized threats in and around the MPA have been reduced/ minimized ? (considering Annexures 4, 5 and 12a)		
Assessment criteria	**Rating/ Score**	**Comments/ justification**
Threats to the MPA have not been reduced but have increased.	Poor (Score 2.5)	
Some threats to the MPA have been reduced, but others continue to have an impact on values.	Fair (Score 5)	
Most threats to the MPA have been reduced; the few remaining threats are being addressed.	Good (Score 7.5)	
All threats to the MPA seem to have been effectively contained or reduced, and an effective system is in place to deal with any emerging threats.	Very good (Score 10)	

12 Assessment is t be done after considering key relevant stakeholders for the MPA, and the kind of information to be provided to each type of stakeholder

8.3. OUTPUTS – To what extent have research and monitoring contributed to management in the MPA?

This output seeks to determine what research and monitoring activities have occurred in the MPA over the past 3 years and the extent to which these activities have contributed to management in the MPA.

Monitoring	A series of measurements that are repeated on the same sites or individuals over a period of time
	Quantifying levels and types of activity in an area and changes in these (or the impacts of particular activities) over time
	Evaluating success and impacts of management strategies
Applied research	Assessing the specific causes of observed changes in areas or resources
	Understanding the factors that control the distribution and abundance of animal and plant resources
	Establishing the existence of links between activities and impacts on an area or resource
Resource assessment	Finding out what is there and what is special about an area or resource
	Assessing the uses and values of an area or the impacts for planning

[Adapted from Kenchington R, Ch'ng K. Staff training materials for the management of marine protected areas. RCU/EAS Technical Report Series, No. 4. UNEP, 1994].

Annexure 12b is a format that documents:

1. What, if any, biophysical research and monitoring activities have occurred in the MPA over the past 3 years
2. Who has undertaken that research and/or monitoring (name the agency, organization or individual)
3. Whether a report about that research or monitoring has been submitted. If yes, the link/ reference can be provided.
4. Any implications for management arising from that biophysical research or monitoring.

If a monitoring program has yet to be developed, Human (2010) has a checklist for what makes a good indicator:

- An indicator needs to be responsive to change in the system and accurately reflect what is happening in the system.
- An indicator needs to be sensitive to particular threats (pressures) that have been identified for the system.
- The indicator can be used to distinguish between anthropogenic impacts and natural variation.
- An indicator should be largely insensitive to expected sources of interference.

- The indicator is usable over a range of spatial and temporal scales.
- The response time of an indicator must be appropriate for the temporal scale of the environmental processes and functions that occur within the system.
- An indicator must be accessible for year-round sampling; if not, seasonal factors (or other factors) need to be accounted for accurately.

OP4 - How much research and monitoring have been undertaken in the MPA (considering Annexure 12b)?		
Assessment criteria	**Rating/ Score**	**Comments/ justification**
There is little or no monitoring, and no research has been reported in the last 5 years.	Poor (Score 2.5)	
There is some *ad hoc* monitoring and research, but they are not coordinated nor effectively reported.	Fair (Score 5)	
A sound research and monitoring program exists, prioritized to meet the key knowledge gaps with regard to prioritized threats and values in the MPA.	Good (Score 7.5)	
A sound research and monitoring program exists, prioritized to meet the key knowledge gaps in the MPA and with the results being used in adaptive management.	Very good (Score 10)	
There is an integrated research and monitoring program in place that is periodically updated by the management of the MPA in conjunction with researchers and that has proven to be effective in monitoring access, resource use and the key objectives of the MPA.	Excellent (Score 12)	

8.4. OUTPUTS – How much has the socio-economic knowledge base for the MPA increased over the last 3 years?

Background

As with OP3, this output seeks to quantify what social and economic knowledge has been collated for the MPA in the past 3 years and how this knowledge has contributed to the management. It is assumed that some social and economic research and monitoring will be part of the prioritized list of research and monitoring activities on the basis of the knowledge gaps. **Annexure 12C** builds on the same template as Annexure 12B.

OP5 - How much socio-economic research has been undertaken in the MPA (considering Annexure 12c)?		
Assessment criteria	**Rating/ Score**	**Comments/ justification**
There is little or no monitoring, and no socio-economic research has been reported in the last 5 years.	Poor (Score 2.5)	
There is some *ad hoc* socio-economic monitoring and research, but it is not coordinated nor effectively reported.	Fair (Score 5)	
A sound socio-economic research and monitoring program exists, prioritized to meet the key knowledge gaps with regard to key stakeholders, prioritized threats and values in the MPA.	Good (Score 7.5)	
A sound socio-economic research and monitoring program exists, prioritized to meet the key knowledge gaps with regard to key stakeholders and their interaction with the MPA, with the results being used in adaptive management.	Very good (Score 10)	
There is an integrated research and monitoring program in place that is updated by the management of the MPA periodically in conjunction with researchers and that has proven to be effective in monitoring stakeholder engagement, access, resource use and the key objectives of the MPA.	Excellent (Score 12)	

9. Developing a Better Understanding of ‘Outcomes’

Eight questions (OC1 to OC5 below) help identify the key components within the important element of 'outcomes':

9.1. OUTCOMES – Have the priority management issues been effectively addressed? And are the resulting management actions and targets clearly linked to specific outputs and outcomes in any plan(s)?

Background

Having initially determined the key management issues on the basis of the highest priority threats (**Annexure 5**), there is a need to show clear linkages between those issues and the management actions, targets and objectives and outputs in any plan.

Case Example 3 shows how actions and targets have been linked to specific outputs and desired outcomes in the GBR Reef 2050 Sustainability Plan. **Annexure 11** provides a matrix to determine which planning and/or management documents are addressing the key priority issues, and **Annexure 12A** provides a format to assess the status of key management actions to address key pressures.

OC1 - How many of the planned management objectives have been achieved (considering Annexure 12a)?		
Assessment criteria	**Rating/ Score**	**Comments/ justification**
Virtually no part of the annual work program has progressed as planned, failing to achieve most of the stated management objectives in the management plan.	Poor (Score 2.5)	
Some parts of the annual work program have progressed as planned, meeting most of the stated management objectives in the management plan.	Fair (Score 5)	
Most of the annual work program has progressed as planned, meeting most of the stated management objectives in the specified time frame.	Good (Score 7.5)	
The entire annual work program has progressed as planned, in the specified time frame and meeting the stated management objectives.	Very good (Score 10)	

9.2. OUTCOMES – To what extent is the MPA moving towards the attainment of the desired outcomes for threatened species set out in any planning documents?

Background

Where habitats, species or groups of species have been identified as being potentially at risk, some form of vulnerability assessment should be undertaken to help inform the management actions and priorities.

Such an assessment needs to determine the overall vulnerability of each threatened species to each threat (see **Annexure 5**) as well as assess its capacity to adapt naturally or in response to management actions. It can also act as a catalyst for consultation and engagement with relevant sectors and stakeholders.

OC2 - Are the populations of endemic/ threatened species declining, stable or increasing (considering annexures 1a, 2a and 5)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
Most or all endemic, threatened or endangered species populations are declining or no information is known.	Poor (Score 2.5)	
Only a few threatened/ endangered species populations are stable or increasing; most of the others appear stable, but little information is available.	Fair (Score 5)	
Most populations of endemic, threatened and endangered species are known to be either increasing or stable.	Good (Score 7.5)	
All populations of endemic, threatened and endangered species have been shown to be either increasing or stable.	Very good (Score 10)	

OC3 - Are the prioritized values declining, stable or increasing (considering annexures 1b, 2a, 2b, 3 and 5)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
Most or all the high priority natural values are declining or no information is available.	Poor (Score 2.5)	
Only a few of the high priority natural values are stable or increasing; most of the others appear stable, but little information is available.	Fair (Score 5)	
Most of the high priority natural values are known to be either increasing or stable.	Good (Score 7.5)	
Virtually all the high priority natural values have been shown to be either increasing or stable.	Very good (Score 10)	

OC4 - Are the prioritized threats declining, stable or increasing (considering annexures 1 - 5)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
Very few, if any, of the high priority threats are decreasing, or no information is available.	Poor (Score 2.5)	
Only a few of the high priority threats are decreasing; most of the others appear to be increasing or stable, but little information is available.	Fair (Score 5)	
Some of the high priority threats remain, with all the other threats either decreasing or stable.	Good (Score 7.5)	
Very few of the high priority threats remain, with all the other threats either decreasing or eliminated.	Very good (Score 10)	
All the high priority threats have been eliminated or have been shown to be decreasing.	Excellent (Score 12)	

9.3. OUTCOMES – To what extent have the MPA managers developed effective partnerships with local communities and/ or stakeholders to address the priority management issues?

Background

The protection of the range of values of the MPA requires more than just the efforts of the managers. Local communities, resource users, businesses, industries, researchers and various line departments and agencies- all need to work together to ensure the best possible outcomes for the MPA. This requires engagement in various ways, including enhancement of community awareness, best practice education and ongoing community consultation as well as open and productive partnerships between key stakeholders.

Communication and engagement across sectors need to create awareness of all management and planning documents and the efforts by managers, governments, industry, researchers and the community to work together to maintain the values of the MPA. Regular communication with partners, stakeholders and the community about threats, management actions and achievements will help build awareness and develop a spirit of co-operative management.

The tourism industry can be a key partner in the protection and management of a MPA, through enhancing visitor experience.

Annexure 6 is about developing a stakeholder register for the MPA; this outcome is about assessing the extent to which the wider community, not just tourism, has been engaged in the MPA.

OC5 – How supportive are LOCAL COMMUNITIES about MPA management (considering annexures 3 and 6)?		
Assessment criteria	**Rating/ Score**	**Comments/justification**
Most of, if not all, the local communities have little awareness of the MPA or are hostile toward to the MPA.	Poor (Score 2.5)	
Some local communities are aware of and supportive of the management of the MPA.	Fair (Score 5)	
Most locals and their communities are supportive of the management of the MPA.	Good (Score 7.5)	
All local communities are aware of and supportive of the management of the MPA, with local Advisory Committees regularly meeting at key centres.	Very good (Score 10)	

9.4. OUTCOMES – To what extent are the expectations of visitors to the MPA being met?

Background

Many factors can influence a visitor's perception of a visit to a MPA including:

- Individual visitor characteristics
  - usual place of residence;
  - cultural background;
  - age;
  - motivations/expected benefits (type of experience sought or expected);
  - experience with the site and activities; and
  - knowledge of the site and minimal impact behaviors.
- Actual on-site behavior
  - types of activities undertaken
  - level of activity participation; and
  - encounters with other users (i.e., level of crowding)
- Perceived quality of the natural environment, including contact with wildlife, scenic quality and perceived human impacts; and
- Perceived quality of the tour operators
  - staff friendliness and competence; and
  - amount and quality of information/ interpretation.

Managers can have some influence over some the above factors (but clearly not all!) but should also recognize that not all visitors are looking for the same kind of experience from their visit. One way is to actively manage to provide for different experiences in different locations. **Case Example 8** outlines five different visitor settings in high use parts of the GBR (it is important to understand that these settings sit on top of the underlying zoning).

Case Example 8

Five different visitor settings provided in high use parts of the GBR

Setting	Description	Management guidelines	Maximum group size (including crew)	Maximum overall length of vessel (meters)
Setting 1 (Developed)	Areas in this setting are immediately adjacent to urban areas and resorts. They are the access points to the Planning Area and a focus of intensive tourism and recreation. The areas are heavily used by a wide range of craft, and contain permanent facilities (for example, marinas, jetties and boat ramps).	Each site will require detailed assessment of adjacent development proposals. Additional site planning may also be required to determine appropriate visitor management arrangements.	No limit	70
Setting 2 (High Use)	This is a natural setting that may have high levels of visitation. The areas in this setting are easily accessed, and appropriate facilities (for example, pontoons, moorings, markers) may be required to manage impacts and assist in visitor appreciation of the area. The areas are regularly visited by larger vessels and aircraft.	Sites will be managed for large groups of people and have appropriate facilities to minimize visitor impacts and help improve the visitor experience. Each site will have specific strategies to guide site development and management.	No limit	35
Setting 3 (Moderate Use)	This is a natural setting that may have moderate levels of visitation, with appropriate moorings and management facilities to manage impacts. The areas in this setting are occasionally visited by larger vessels and aircraft.	Sites will have appropriate facilities to minimize visitor impacts and enhance the visitor experience.	40 people	35
Setting 4 (Natural)	This is a natural setting that has low levels of visitation. The areas in this setting are generally free of facilities, larger vessels and aircraft.	Visitor sites are generally free of facilities unless these facilities are essential for minimizing visitor impacts, e.g., toilets. Commercial activity permits may be issued. Group activity permits and special activity permits will not be issued. Some sites may be set aside for noncommercial use only; no generators or compressors permitted.	15 people	35
Setting 5 (Protected)	This is a protected natural setting that has areas of outstanding or unique conservation value and areas of special management concern. Operations conducted in these areas are limited and managed according to individual site plans. Seasonal closures may be enforced (eg. during key breeding times)	No facilities provided. Group activities and special activity not permitted. Commercial use (including filming) generally not permitted. Free and independent traveller use permitted, except for locations with seasonal or permanent closures. No generators or compressors permitted.	15 people	20

One key assumption regarding output criteria 6 is that basic feedback is being obtained from visitors to record their experience and their suggestions on the facilities, etc in the tourism zone of the MPA. Expectations are perceptions, and therefore, at present there are no objective criteria here.

OC6 - Are the expectations of visitors generally met or exceeded?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
The expectations of most visitors generally not met.	Poor (Score 2.5)	
The expectations of some visitors are usually met.	Fair (Score 5)	
The expectations of most visitors are met.	Good (Score 7.5)	
High expectations of the majority of visitors are met, and sometimes their experiences exceed their expectations.	Very good (Score 10)	

9.5. OUTCOMES - Is the MPA being consciously managed to adapt to climate change and natural disasters?

Background

Ecosystem services arising out of protected marine and coastal ecosystems are the foundation for the livelihood security of coastal communities as well as business establishments and coastal megacities. The positive impact that the marine and coastal protected areas have for climate change management and disaster risk reduction strategies further accentuates their role in safeguarding human habitations, livelihoods and overall well-being. However, there is a trade-off in the use of ecosystem services by different activities of various sectors, and this trade-off exists within the 'green sector' as well. For sustaining the life-supporting ecosystem services, it is extremely relevant to be able to identify such synergies and trade-offs at the right time and integrate the mitigation measures into the MPA management planning.

By its global nature, climate change is affecting many aspects of marine and coastal ecosystems throughout the world. Direct evidence of the vulnerability of these habitats has arisen following major coral bleaching events and widespread damage of reefs and other key habitats from extreme weather events.

A comprehensive vulnerability assessment in the GBR confirmed that increasing sea temperature is the single biggest risk factor over the short- to mid-term (years to decades) and the major cause of the predicted decline in coral communities in the foreseeable future, with flow-on effects through the entire ecosystem.

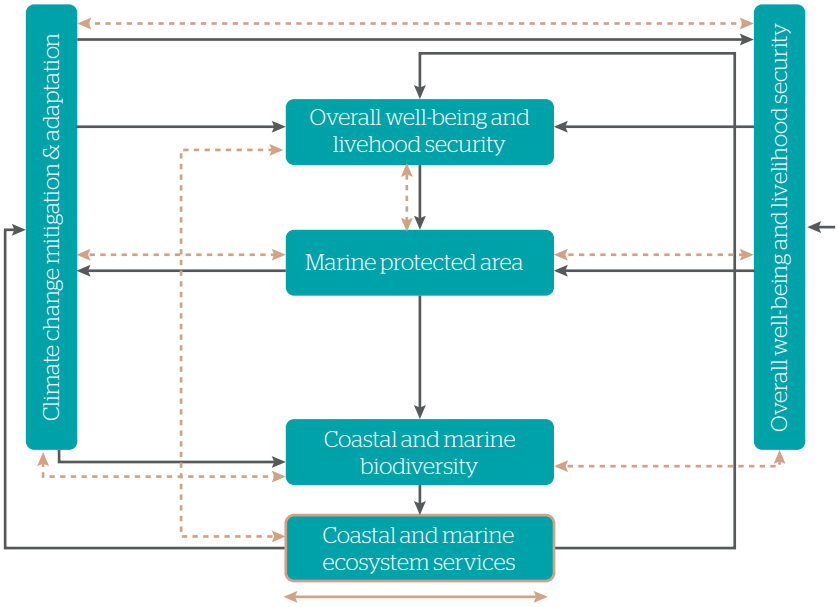
Marine and coastal ecosystems around the world are experiencing an increasing demand for their diverse ecosystem services, required for different sectors such as fisheries, tourism and biodiversity conservation.

Threats to marine and coastal biodiversity are further enhanced in light of the observed and predicted impacts of climate change. Climate change will have heightened negative impacts on the coastal ecosystems by increasing the risk of natural disasters such as coastal flooding and other extreme events (IPCC 2012). CCA is an important management strategy for reducing the vulnerability of people and infrastructure to the negative impacts of climate change. CCA interventions reduce the threats to habitats and tourism infrastructure and therefore enhance tourism opportunities (Parry et al 2007).

However, 'trade-offs' can be seen with the adaptation options, viz., progress toward one objective such as increasing tourism facilities has often been at the cost of other objectives such as conserving biological diversity or improving water quality (MEA 2005). Similarly, protective hard infrastructure raised as CCA options (such as seawalls, floodgates and tidal barriers and saltwater-intrusion barriers) have been reported to be ineffective in extending protection, rather enhancing the risk of natural disasters and contributing to habitat loss due to coastal squeeze (Knogge et al 2004; Rochelle-Newall et al 2005). Such CCA strategies, termed mal-adaptation (Burton 1996), may compromise biodiversity and ecosystem stability in the long term and not only increase disaster risk but also diminish livelihood opportunities of the population and make them more vulnerable to climate change.

Sustainable management of MPAs can be realized only with an inclusive approach toward managing marine and coastal biodiversity, where all climate change adaptation and disaster risk reduction activities in and around MPAs should be implemented keeping in mind the possible synergies and trade-offs with coastal and marine biodiversity conservation.

Figure 1: Overview of synergies and trade-offs of marine and coastal protected areas and their interrelationships
(Source: Khera 2014)



OC7 - Is the MPA being consciously managed to adapt to climate change (considering annexures 1a, 1b, 2a, 3, 4, 5 and 12a)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
There have been no efforts to consider adaptation to climate change in the management.	Poor (Score 2.5)	
Some initial thought has taken place about likely impacts of climate change, but this has yet to be translated into management plans.	Fair (Score 5)	
Detailed plans have been drawn up about how to adapt management to predicted climate change, but these have yet to be translated into active management.	Good (Score 7.5)	
Detailed plans have been drawn up about how to adapt management to predicted climate change, and these are already being implemented.	Very good (Score 10)	

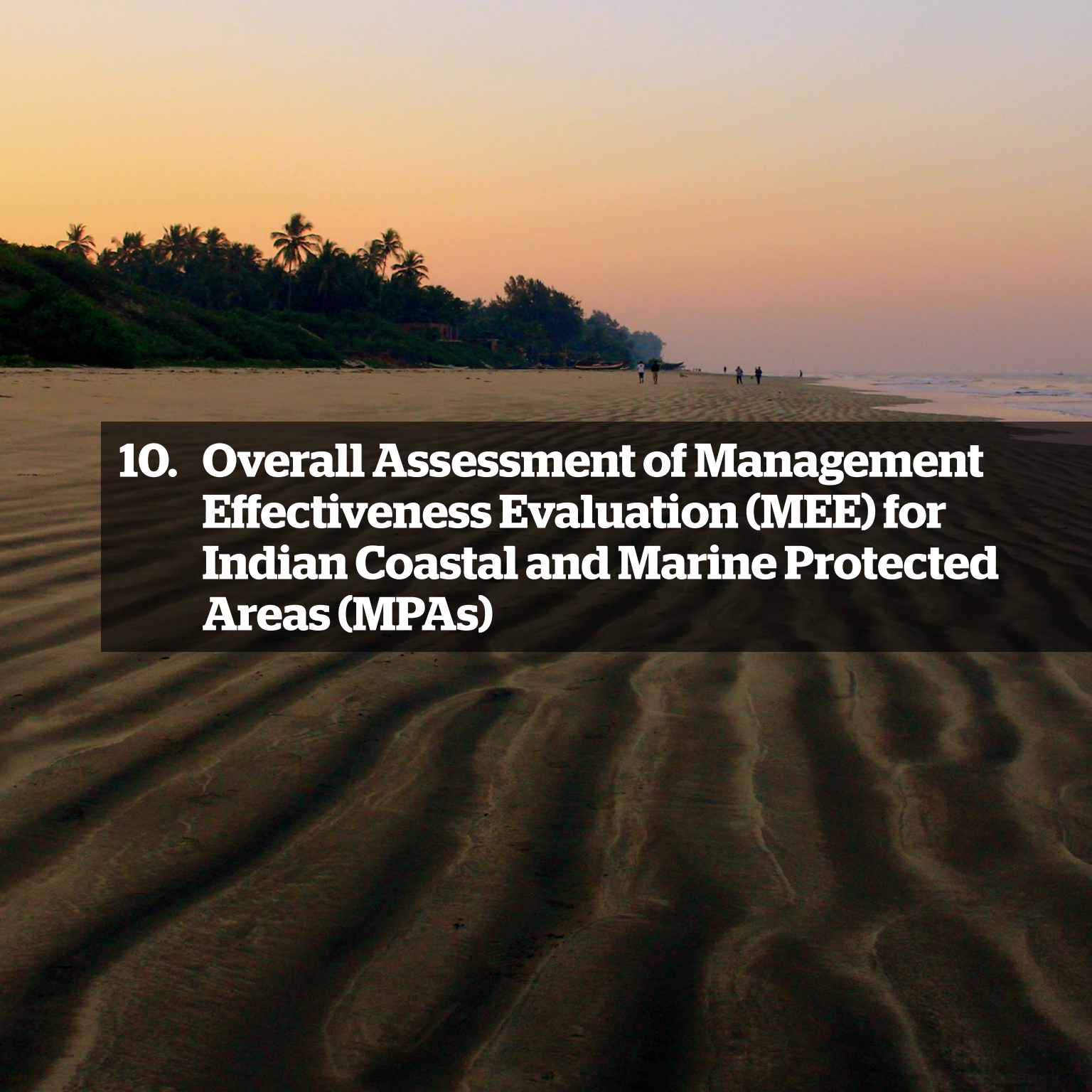
OC8 - Is the MPA being consciously managed for disaster risk reduction (considering annexures 1a, 1b, 2a, 3, 4, 5 and 12a)?		
Assessment criteria	**Rating/Score**	**Comments/ justification**
There have been no efforts to consider disaster risk reduction in the management of the MPA.	Poor (Score 2.5)	
Some initial thought has taken place about disaster risk reduction, but this has yet to be translated into management plans.	Fair (Score 5)	
Plans have been drawn up about disaster risk reduction, but these have yet to be translated into active management.	Good (Score 7.5)	
Detailed plans have been drawn up about disaster risk reduction, and these are already being implemented.	Very good (Score 10)	

Case Example 9

The GBR Climate Change Adaptation Strategy (2012-17)

The GBR Climate Change Adaptation Strategy (2012-17) is guided by the following key principles:

- Focusing on reducing non-climate stresses – thereby building ecosystem resilience to better cope with climate change.
- Involving local communities - adaptation measures are more successful when the local population participates in both planning and implementation.
- Multi-partner strategy development - collaborating with industry groups, communities and other organizations can raise awareness, share experiences and build capacity - these are the core ingredients of effective adaptation.
- Building on existing good practices in natural resource management - ecosystem-based adaptation helps reduce vulnerability and increases resilience to climate and non-climate risks. It can provide multiple benefits to society and the environment.
- Adaptive management approaches - identify and test adaptation options and monitor their implementation so that management actions can be adjusted.
- Integrating ecosystem-based adaptation with wider adaptation strategies - everyone can play a role in increasing resilience in the face of global threats and local pressures. The importance of partnerships and stewardship in securing a sustainable future for the Reef.
- Communicating and educating - knowledge transfer, capacity building, integrating science and local knowledge and raising awareness are fundamental, about both climate change impacts and the benefits of sound ecosystem management.



10. Overall Assessment of Management Effectiveness Evaluation (MEE) for Indian Coastal and Marine Protected Areas (MPAs)

The scorecard below provides the summary assessment of all the elements of the MEE framework.

Framework element number	Framework element name	Number of questions (a)	Maximum mark per question (b)	Total (a) x (b)	**Marks obtained for the element** *(after completing the relevant annexure)*	**Overall score (%)**
1.	Context	5	10	50		
2.	Planning	9	10	90		
3.	Inputs	6	10	60		
4.	Process	8	10	80		
5.	Outputs	6	10	60		
6.	Outcomes	8	10	80		
Total				420		

Annexure 14 provides some alternative checklists that may be utilized instead of some of the exiting checklists (primarily within inputs, planning, or processes).

Annexure

Annex: Tools for assessment

This section provides the checklists, formats and templates required for conducting the assessment. For downloading these tools in an editable Word format, click here: https://indo-germanbiodiversity.com/publications.html (this weblink will change later).

Annexure 1a– Checklists of key natural values and attributes of the MPA and adjoining areas (tick those that occur in the MPA)

Key values and attributes within the MPA and adjoining marine areas	Tick if relevant	Values and attributes of coastal/terrestrial habitats that are adjacent to, and support, the MPA	Tick if relevant	Values and attributes of key marine species within, or adjoining, the MPA	Tick if relevant
Islands		Intertidal lands (mudflats)		Endemic species	
Beaches		Estuaries		Mangroves	
Rocky coastline		Salt marshes		Seagrasses	
Mangrove forests		Freshwater wetlands		Macroalgae	
Seagrass meadows		Forested floodplains		Benthic microalgae	
River deltas		Heath/shrublands		Corals	
Shallow coral reefs (<25 m)		Grasses		Other invertebrates	
Deeper reefs (>25 m)		Sedgelands		Plankton and microbes	
Inter-reef communities		Woodlands		Bony fish	
Shoals		Forests		Sharks and rays	
Algal communities		Rainforests		Sea snakes	
Continental slope		Connecting water bodies		Marine turtles	
Channels and canyons		Wetlands of international importance		Crocodiles	
Deep oceanic waters		River deltas		Seabirds	
Other (list).....		*Other* (list).....		Shorebirds	
				Whales	
				Dolphins	
				Dugongs	
				Other (list).....	

Annexure 1 b - Checklists of key cultural and socio-economic values and attributes of the MPA and adjoining areas

Traditional or religious values and attributes	Tick if relevant	Historic or scientific values and attributes	Tick if relevant	Values and attributes relating to community well-being	Tick if relevant
Sacred sites, sites of special cultural significance		Features of non-military historic significance – e.g., historic ship-wrecks		Places important for collection of marine/coastal resources for livelihoods	
Places important for cultural practices, observances, customs, ongoing cultural traditions		Features of military historic significance – e.g., war features or sites		Places of employment/ for earn-ing income	
Places relevant to traditional stories, song-lines, totems and languages		Structures of historic signifi-cance – e.g., ports, light stations		Community gathering places	
Indigenous values		Sites/locations of historic signifi-cance – e.g., historic landing site		Places for public appreciation/ understanding	
Indigenous structures		Places of **scientific** significance e.g., research stations, expedition sites, endemic type localities		Places of esthetic importance	
Archaeological sites, heritage research sites		Places of **educational** signif-icance, e.g., interpretive trails, education centres,		Places recognized for health benefits	
Places of personal/spiritual connection		Places of other **social signifi-cance** *(if not already addressed in the traditional/indigenous table), e.g., iconic sites*		*Other* (list).....	
Other (list).....		Strategic value			
		Other (list).....			

Annexure 2 a- Template for assessing key natural values and attributes (bring from Annexure 1 the natural values to be written in the first column)

Natural values and attributes within marine-related habitats within the MPA	**Extent (number or area in hectares)**	**Condition** (Very Good, Good, Fair, Poor) and **Trend** (improving, stable or deteriorating)				**Significance of values**					**Importance**				**Score**	**Priority of value**
						Biodiversity	**Socio-economic**	**Scientific/ educational**	**Historical/ cultural**	**Traditional/ indigenous**	**Local**	**Regional**	**National**	**Global**		

Annexure 2 b - Template for assessing key socio-economic values and attributes (once Annexure 1 is completed, use it to populate the last column)

Socio-economic values and attributes within the MPA	**Extent (number or area in hectares)**	**Condition** *(Very Good, Good, Fair, Poor) and* **Trend** *(improving, stable or deteriorating)*				**Significance of values**				**Importance**				**Score**	**Priority of value**
						Socio-economic	**Scientific/ educational**	**Historical/ cultural**	**Traditional/ indigenous**	**Local**	**Regional**	**National**	**Global**		

Annexure 3– Template for assessment and prioritization of ecosystem services of the MPA

Type of ecosystem service	**Relevant use in MPA**	**Extent of use**** *(see below)*		**Ecosystem services trade-offs** *(indicate major trade-offs from another ES)*	**Priority rank of the ecosystem service**	**Special management needs**
		Inside MPA	**Outside MPA**			
Provisioning services (products obtained from the coastal and marine ecosystem)	Fishing – mechanized					
	Fishing – artisanal					
	Fishing – recreational					
	Collection fisheries (e.g., shells and mollusks)					
	Aquaculture/mariculture					
	Extractive marine activities (e.g., seabed mining, salt extraction,)					
	Extractive non-marine activities (e.g., wood harvesting, sand mining)					
	Ports and port activities, marinas, water ways					
	Small boat fishing harbor					
	Ship building, ship-breaking, etc.					
	Oil transfer facilities					
	Military training/practices					
	Bio-prospecting					
	Others					

Type of ecosystem service	Relevant use in MPA	Extent of use** *(see below)*		Ecosystem services trade-offs *(indicate major trade-offs from another ES)*	Priority rank of the ecosystem service	Special management needs
		Inside MPA	Outside MPA			
Cultural services (non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and esthetic experiences)	Fee-paying tourism					
	Non- extractive recreational activities (e.g., sailing, swimming, snorkelling, sea-walk, diving)					
	Scientific research activities					
	Educational/interpretive activities (school programs, marine science training)					
	Religious activities					
	Spiritual activities					
	Others...					
Regulatory services (benefits obtained from the regulation of ecosystem processes)	Protection by mangroves					
	Fish breeding grounds					
	Protection from cyclones, erosion					
	Reducing the impact of disasters					
	Carbon sequestration					
	Flood regulation					
	Other....					
Support services (services necessary for the production of all other ecosystem services)	Sedimentation (inflow, dispersal, resuspension and consolidation of sediments)					
	Nutrient cycling *(especially the nutrient coming off the land and impacting the MPA)*					
	Connectivity (land-sea, across shelf, long-shore, etc.)					
	Herbivory					
	Other (specify)					

** **Extent** *(insert one only)* Throughout =10 Widespread =7.5 Localised/sporadic= 5 Small/only specific area= 2.5

Annexure 4- Assessment of factors affecting the MPA to determine the key/priority threats [The Annexure 4 table is based largely upon Salafsky et al (2008)[13] with adaptations.]

	Specific factor for the MPA (Present/ Absent)	Positive	Negative	Current	Potential	Inside	Outside
1. Residential & commercial development	Human settlements or other non-agricultural land uses with a substantial footprint						
1.1 Housing & urban areas *urban areas, suburbs, villages, vacation homes, , offices, schools, hospitals, military establishment, landfills*							
1.2 Commercial & industrial areas *manufacturing plants and industrial area, shopping centers, office parks, military bases, power plants, train & ship yards, airports, special economic zones, wind mills, solar parks, ship-building and shipbreaking*							
1.3 Tourism & recreation assets *Water sports, amusement park, golf courses, hotels and resorts, cricket fields, county parks, major camp ground, home stays,* ***visitor centres, jetties, waste due to religious mass tourism***							
1.4 Park interpretation centers and visitor facilities *Park visitor facilities – signage, trail hardening, information booths, minor picnic facilities, minor camp sites, moorings/ marker buoys*							

	Specific factor for the MPA	Positive	Negative	Current	Potential	Inside	Outside
2. Agriculture & aquaculture	Threats from farming and ranching as a result of agricultural expansion, intensification or practices; includes silviculture, mariculture and aquaculture						
2.1 Annual & perennial non-timber crops *Farms, homegrdens, plantations, orchards, vineyards, mixed agroforestry system, coconut, areca, cashew, casuarina*	Crops planted for food, fodder, fiber, fuel, or other uses						

13 Salafsky et al (2008) *A Standard Lexicon for Biodiversity Conservation: Unified Classifications of Threats and Actions.* Conservation Biology, 22: 897–911

	Specific factor for the MPA	Positive	Negative	Current	Potential	Inside	Outside
2.2 Wood & pulp plantations *Teak, rubber, eucalyptus, etc. plantations*	Stands of trees planted for timber or fiber outside of natural forests, often with non-native species						
2.3 Livestock farming & ranching *Cattle feed lots, dairy farms, grazing, cattle ranching, chicken farms, goat, emu farms, piggery*	Domestic terrestrial animals raised in one location on farmed or non-local resources (farming); also, domestic or semidomesticated animals allowed to roam in the wild and supported by natural habitats (ranching)						
2.4 Marine & freshwater aquaculture *Shrimp or fin fish aquaculture, turtle hatchery, cage mariculture, artificial algal beds*	Aquatic animals raised in one location on farmed or non-local resources; also, hatchery fish allowed to roam in the wild						
3. Energy production & mining	Threats from production of non-biological resources						
3.1 Oil & gas drilling *Oil wells, refineries, onshore and deep-sea oil and natural gas explorations, drilling, oil transects*	Exploring, developing and producing petroleum and other liquid hydrocarbons						
3.2 Mining & quarrying *Coal mines, rare earth material mining, gold mines, rock quarries, coral mining, deep sea mining, sand mining*	Exploring, developing, and producing minerals and rocks						
3.3 Renewable energy *Solar farms, wind mills and tidal farms*	Exploring, developing, and producing renewable energy, *threat to birds or bats flying into windmills*						
3.4 Non-renewable energy *Thermal, nuclear, diesel power generation*							

	Specific factor for the MPA	Positive	Negative	Current	Potential	Inside	Outside
4. Transportation & service corridors	Threats from long, narrow transport corridors and the vehicles that use them, including associated wildlife mortality						
4.1 Roads, rail and waterways *National highways, state highways, village roads, bridges & culverts, railway tracks, locks & canals*	Surface transport on roadways and dedicated tracks						
4.2 Utility & service lines *Electrical & phone wires, aqueducts, oil & gas pipelines,*	Transport of energy & resources						
4.3 Ports and shipping lanes and waterways *Ports, harbours, canals, shipping lanes*	Freshwater and ocean waterway transport: *dredging, wakes of cargo ships, ballast water*						
4.4 Air transport/flight paths *Airports, helipads, airstrips, landing grounds, flight paths*	Air and space transport: *jets impacting birds*						
5. Biological resource use	Threats from consumptive use of "wild" biological resources, including deliberate and unintentional harvesting effects; also persecution or control of specific species						
5.1 Hunting and poaching of terrestrial animals *Bushmeat hunting, subsistence hunting, trophy hunting, fur trapping, insect collection, honey or bird nest collection, predator control, pest control*							
5.2 Collection of NTFPs							
5.3 Logging & wood harvesting *Clear cutting of hardwoods, pulp operations, charcoal production*							
5.4 Fishing & harvesting aquatic resources *Mechanized, artisanal fishing via trawling, blast / spear fishing shellfish harvesting, turtle egg / live coral / seaweed collection, bycatch, incidental take of protected animals, fish aggregation*							
5.5 Illegal collection of coastal and marine species for handicrafts Manufacturing of artefacts and handicrafts out of protected species, e.g., shells, cowries and stuffed animals							

	Specific factor for the MPA	Positive	Negative	Current	Potential	Inside	Outside
6. Human intrusions & disturbance	Threats from human activities that alter, destroy and disturb habitats and species associated with non-consumptive uses of biological resources						
6.1 Recreational activities *Motorboats, aquatic sports, jet-skis, SCUBA dive boats, ultralight planes, whale and dolphin/ whale shark watching, hikers, birdwatchers, pets in MPAs, backcountry camping, caving, rock-climbing, backwaters, boardwalks*	People spending time in nature or traveling in vehicles outside of established transport corridors, usually for recreational reasons						
6.2 War, civil unrest & military exercises *Military exercises, training and firing ranges, armed depots, ammunition and explosive deposits*	Actions by formal or paramilitary forces, mostly without leaving a permanent footprint						
6.3 Illegal activities *Encroachment, poaching, illegal extraction, illegal plantation, drug smugglers, looting, theft, vandalism, treasure hunting, illegal removal of fossils, graffiti, arson, illegal immigrants*	People undertaking illegal activities in natural environments for illegal gain or causing unwanted destruction of natural features						

		Positive	Negative	Current	Potential	Inside	Outside
7. Change in land-use pattern	Threats from actions that convert or degrade habitats to "manage" natural or semi-natural systems, often to improve human welfare						
7.1 Specific disaster management measures *Fire suppression to protect homes, inappropriate fire management, escaped agricultural fires, arson, campfires, fires for hunting, flood and cyclone protection measures*	Suppression or increase in frequency and/or intensity outside of its natural range of variation						

		Positive	Negative	Current	Potential	Inside	Outside
7.2 Hydro projects *Dam construction/operations, sediment control, change in salt regime, wetland filling for levees and dikes, surface water diversion, groundwater pumping, channelization, artificial lakes*	Changing water flow patterns from their natural range of variation either deliberately or as a result of other activities						
7.3 Ecosystem modifications *Land reclamation, rip-rap along shoreline, mowing grass, tree thinning in parks, beach construction, removal of snags from streams*	Other actions that convert or degrade habitats in "managing" natural systems to improve human welfare						
8. Invasive & problematic species, pathogens and genes	Threats from non-native and native plants, animals, pathogens/microbes, or genetic materials that have or are predicted to have harmful effects on biodiversity following their introduction, spread and/or increase in abundance or virulence						
8.1 Invasive non-native/alien species plants & animals *Kappaphycus, snowflake coral etc., introduction of species for biocontrol and as commercial crops, feral dogs and cats, household pets, species transported in ballast water*	Harmful plants and animals not originally found within the ecosystem(s) in question and directly or indirectly introduced and spread into it by human activities						
8.2 Problematic native plants & animals *Overabundant native species such as crown-of-thorns starfish and jellyfish, overabundant algae due to loss of native grazing fish, plague affecting rodents, invasive grasses, crocodiles, elephants, sharks*	Harmful plants and animals that were originally found within the ecosystem(s) in question but have become "out-of-balance" or "released" directly or indirectly due to human activities; hyper-abundant species leading to an ecological imbalance						
8.3 Introduced genetic material *Pesticide resistant crops, restoration projects using non-local seed stock, genetically modified insects for biocontrol, genetically modified trees, other genetically modified organisms*	Human-altered or -transported organisms or genes						
8.4 Pathogens & microbes	Harmful native and non-native agents that cause disease or illness to a host, including bacteria, viruses, prions, fungi and other microorganisms						

		Positive	Negative	Current	Potential	Inside	Outside
9. Pollution	Threats from introduction of exotic and/or excess materials or energy from point and nonpoint sources						
9.1 Household sewage & urban waste water *Discharge from municipal waste treatment plants, leaking septic systems, untreated sewage, outhouses, oil or sediment from roads, fertilizers and pesticides from lawns and golf-courses*	Water-borne sewage and non-point run-off from housing and urban areas, including nutrients, toxic chemicals and/or sediments						
9.2 Industrial & military effluents *Toxic chemicals from factories, illegal dumping of chemicals, mine tailings, arsenic from gold mining, leakage from fuel tanks, PCBs in river sediment and at coast, oil spills,*	Water-borne pollutants from industrial and military sources, including mining, energy production and other resource-extraction industries (nutrients, toxic chemicals, sediments, etc.)						
9.3 Agricultural & forestry effluents *Nutrient loading from fertilizer run-off, herbicide run-off, manure from feedlots, nutrients from aquaculture, soil erosion*	Water-borne pollutants from agricultural, silvicultural and aquaculture systems, including nutrients, toxic chemicals and/or sediments						
9.4 Garbage & solid waste *Municipal waste, litter from cars and boats, marine debris, construction debris, landfill sites*	Rubbish and other solid materials including those that entangle wildlife						
9.5 Air-borne pollutants *Acid rain, smog from vehicle and industry emissions, excess nitrogen deposition, radioactive fallout, wind dispersion of pollutants or sediments or dust from fields, smoke from forest fires or wood stoves*	Atmospheric pollutants from point and nonpoint sources						
9.6 Excess energy *Noise from highways or airplanes, sonar from submarines and oil exploration that disturbs whales, heated water from power plants, lamps attracting insects, beach lights disorienting turtles*	Inputs of heat, sound or light that disturb wildlife or ecosystems						

		Positive	Negative	Current	Potential	Inside	Outside
10. Geological events	Threats from catastrophic geological events						
10.1 Volcanoes *Eruptions, emissions of volcanic gasses*	Volcanic events						
10.2 Earthquakes/tsunamis	Earthquakes and associated events						
10.3 Landslides and landslips *Landslides, mudslides*	Avalanches or landslides						
11. Climate change and extreme events	Changes in climate patterns (e.g., those resulting from increased atmospheric greenhouse gases like CO_2) and/or events outside the natural range of variation that could wipe out a vulnerable species or ecosystem						
11.1 Changes in sea-level and resulting habitat loss	Large-scale effects of ecosystems shifting and impinging on other species and ecosystems.						
11.2 Changes in geochemical regimes	Broad-scale changes in the geochemical conditions of ecosystems including ocean acidification, changes in salinity and other changes in water quality						
11.3 Changes in temperature regimes	Broad-scale changes in temperature mean, variability, seasonality, and extremes, including changes in temperature extremes, increased average summer temperature, and decreased minimum winter/spring temperature						
11.4 Changes in precipitation & broad-scale hydrological regimes	Broad-scale changes in precipitation mean, variability, seasonality, and extremes, including decreased or increased precipitation, changes in timing of precipitation, changes in form of precipitation (e.g., snow vs rain; snow-cover and snowpack where applicable), changes in evapotranspiration rates and hydrological cycles, and droughts and floods						
11.5 Severe/extreme weather events *Thunderstorms, tropical storms, cyclones, dust storms*	Changes in frequency, timing and/or intensity of storms as well as severe weather events that threaten targets that have lost resilience *(i.e., erosion of beaches during storms)*						

		Positive	Negative	Current	Potential	Inside	Outside
12. Social/cultural change	Changes in climate patterns (e.g., those resulting from increased atmospheric greenhouse gases like CO_2) and/or events outside the natural range of variation that could wipe out a vulnerable species or ecosystem						
12.1 Ritual/spiritual/ religious and associated uses ***Festivals, spiritual gatherings***	Changes to **rituals/spiritual/ religious or associated uses**						
12.2 Changes in traditional ways of life	**Changes in traditional ways of life, loss of traditional knowledge or practices linked to the landscape**						
12.3 Changes in socio-economic conditions	**Changes in livelihoods, local populations and communities, migration to or from the site**						
13. Management activities							
13.1 Infrastructure for patrolling and protection activities. navigational aid ***Navaids, major marker buoys,***							
13.2 Survey, research and monitoring activities ***Bathymetric surveys, geodetic surveys, other survey, research and monitoring activities***	Including routine park management activities and conducting research or surveys						
13.3 Maintenance of public utilities ***(power, water, sanitation, health services, souvenir shops, watch towers, resting places, diving centers, communications)***							
13.4 Facilities to remove or salvage a vessel or aircraft that is wrecked, stranded, sunk or abandoned **Maintenance of ship wrecks, oil spills**							
13.5 Emergency response infrastructure **Disaster preparedness infrastructure such as life boats**							
13.6 Constructed SCUBA diving sites							
14 Other factor(S) impacting the MPA							
14.1							
14.2							

Annexure 5– Prioritization of threats to the MPA

Threats (list here the negative factors identified in Annexure 4)	**Qualifier (see box at the bottom of this table for scoring)**					**Total score[14] (a+b+c+d+e)**
	Spatial scale (a)	Temporal scale (b)	Impact (c)	Management response (d)	Trend (e)	

Box for scoring

Qualifier	Score 1	Score 2	Score 3	Score 4
SPATIAL SCALE – **is the area affected by the factor...**	Restricted (i.e., **over less than 10% of the properties area at any one time)**	Localized (i.e., affecting between 11% **and 50%)**	Extensive **(i.e. 51-90%)**	Very widespread **(91% to 100%)**
TEMPORAL SCALE - **the occurrence of the impact, and whether it is ....**	One-off or rare	Intermittent or sporadic	Frequent	Ongoing
IMPACT **- if the impact on the prioritized ecosystem services are ....**	Insignificant	Minor	Significant	Catastrophic
MANAGEMENT RESPONSE - **the capacity (i.e., staff time, resources, budget, knowledge) of the management to respond to the negative factors**	High capacity	Medium capacity	Low capacity	No capacity and/or resources
TREND - how the trend has developed over the last 6 years and whether the overall impact of the negative factor is..	Decreasing	Static	Increasing	Increasing rapidly

14 Negative factors with the highest scores are the highest priorities that do need to be addressed in a management plan.

Annexure 6 – Stakeholder mapping and analysis for the MPA

Stakeholder (can also be sub-categorized into government, private sector, civil society)	Size (approximate number of organizations or individuals)	Geographical area of influence	Mandate, role, responsibility and function in relation to coastal and marine areas and PAs	Interest in and support to MPA (can be positive, neutral or inhibitive)[15] (at a scale of 0-5)	Power to influence management of coastal and marine PAs, specific areas of influence (at a scale of 0-5)	Relevance score of the stakeholder (interest score + power score)
Global						
National						
State/ region within India						
MPA specific						

15 Includes dependence on coastal and marine areas for livelihood

Annexure 7 – Checklist of key legislative and policy instruments relevant to MPAs

Key international conventions/ agreements/frameworks	Comments - relevance to MPA
The Convention on Biological Diversity (CBD) 7	
The Convention on the Conservation of Migratory Species of Wild Animals (CMS—also known as the Bonn Convention)	
The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	
The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR)	
The Ramsar Convention or the Convention on Wetlands of International Importance	
The World Heritage Convention (WHC)	
The United Nations Framework Convention on Climate Change (UNFCCC)	
United Nations Convention to Combat Desertification (UNCCD)	
Hyogo and Sengai Frameworks for Actions (for Disaster Risk Management)	
The United Nations Convention on the Law of the Sea (UNCLOS)	
Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks	
The London Convention or the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter	
The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes	
The Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries (CCRF)	
International Principles for Responsible Shrimp Farming	
International Convention for the Regulation of Whaling (ICRW), 1946	
International Convention for the Prevention of Pollution from Ships (MARPOL)	
Others.....	

Key Indian (federal) legislation	Comments - relevance to MPA
National Environment Policy	
Wildlife Protection Act of 1972 and Wild Life (Protection) Amendment Act, 2002	
Biological Diversity Act, 2002	
Coastal Regulation Zone (CRZ) notification 2011	
Environment (Protection) Act, 1986	
Water (Prevention and Control of Pollution), 1974, amended in 1988	
Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	
Forest Conservation Act, 1980	
Air (Prevention and Control of Pollution) Act of 1981, amended in 1987	
Environmental Impact Assessment (EIA) Notification, 1994	
Wetland (Conservation and Management) Rules 2017	
National Policy on Marine Fisheries 2017	
Others....	
Key state-level legislation/ rules/ guidelines[16]	**Comments - relevance to MPA**
Local traditional or customary laws relevant to the MPA	**Comments - relevance to MPA**

16 Covering topics such as, Fisheries management, Nature Conservation , Environmental Protection, Coastal Protection and Management, Community rights and participation and Animal rights

Annexure 8 – Checklist of key management tools relevant to MPAs

Key management tools		Responsible agency(ies)		Date/year this management tool was enacted, duration	
A	**The Approved Management Plan of the MPA**				
B	**An annual plan of operation**				
C	**Other management tools** (which may or may not be in the Management Plan)	**Specific name(s) of the actual management tool(s)**	**Extent** of application of tool within MPA**	**Responsible agency(ies)**	**Date/Year this management tool was enacted, duration**
1	Act and/or regulations (see Annexure 7)				
2	Zoning scheme (*If zoning does exist in MPA, list the different zone types)*				
3	Special management areas				
4	Site plans				
5	Other plan(s) from other agencies				
6	Fisheries management rules/ regulations *(spatial or non-spatial)*				
7	Defined shipping lanes				
8	Defined port limits				
9	Temporal/seasonal closures				
10	Environmental impact assessment procedures				
11	Best environmental practices/codes of practice				
12	Approved policies				
13	Permits/licences				
14	User pays/entrance fees				
15	Surveillance/enforcement				
16	Research				
17	Monitoring				
18	Community awareness/outreach				
19	Education and interpretive activities				
20	*Other* (list)				

** **Extent**: Throughout MPA/designated locations as specified/local areas only/wherever required

Annexure 9 – Documenting key financial aspects of the MPA

Categories	Year 1	Year 2	Year 3	Year 4	Year 5	Comments
Income Sources						
State/ UT Government						
Central Government						
Private Sources						
Self-generated Funds (e.g., entry fees, fines)						
Total National Income sources						
International Sources						
Bilateral/Multilateral Agencies						
Private Sources (e.g., foundations)						
Total International Sources						
TOTAL SOURCES OF INCOME						
Breakdown of total expenditure by line item						
Salaries/wages						
Training						
Minor equipment and materials						
Capital assets (vessels, vehicles)						
Field operation costs						
Major conservation projects						
Special studies/consultancies						
Institutional administrative support						
Accrual items (replacement and depreciation)						
TOTAL EXPENDITURE						
Breakdown of expenditure by outcome (see list of component activities below)						
Management of Natural and Cultural Resources						
Compliance and Enforcement						
Community Education on Conservation and Wildlife Matters						
Nature Based Recreation and Tourism						
Administrative Support Services						
TOTAL EXPENDITURE (same as total above)						
ANNUAL BUDGET (INCOME – EXPENDITURE)						

Outcome	Component activities to address the outcome		
Management of Natural and Cultural Resources	• Key Area/Sites Protection • Research & Monitoring • Resource Assessment	• Invasive Species and Feral Animal Management • Fire Management on Islands • Management Planning	• Site Planning Activities • Incident Response Management • Cultural Heritage
Compliance and Enforcement	• Enforcement and Surveillance • Vessel Patrols	• Aerial Surveillance • Permits	
Community Education on Conservation and Wildlife Matters	• Interpretive Centres • Interpretive Products	• Education Services • Community Communication	• Local Advisory Committees
Nature Based Recreation and Tourism	• Maintain existing facilities to appropriate standard	• Priority given to visitor health and safety issues	• Prioritize recreational facilities on the Infrastructure Replacement Capital Program
Administrative Support Services	• Program Coordination • Administration Services • Financial Management	• Transport Management (including vessels) • Training and Staff Development	• Departmental Infrastructure • Plant and Equipment • Staff Services

Annexure 10a: Assessment of priority competence development needs for field-level staff of MPAs[17]:

Types of competence	**Relevance of competence** [Very high relevance=4, High relevance=3, Medium relevance =2, Low relevance=1]	**Existing level of competence** [Very high level=1, High level=2, Medium level =3, Low level=4]	**Priority score** [relevance score + existing level score]	**Capacity development possibility** (e.g., outsourced training, organizing special training programs, MoUs with local institutes, nominations for national training programs, mentoring/ coaching system)
Technical / professional competencies				
Knowledge of Protected Area Policy, planning				
Understanding of coastal and marine biodiversity basic science				
Knowledge of key developments in the domain of coastal and marine biodiversity				
Understanding of legal framework vis-à-vis coastal ecosystems and enforcement requirements				
Ability to plan, manage and monitor activities for crime prevention, law enforcement and compliance				
Ability to design awareness and education programmes				
Understanding of the socio-economic contexts of the coastal ecosystems				
Research and monitoring skills- include planning, implementation and valuation of assessment and monitoring of required elements of biodiversity including coastal habitats, underwater surveys and identification of suitable indicators				
Swimming skills				
Diving skills (mention the number of PADI/other certified staff)				

17 Khera et al (2014)

Types of competence	**Relevance of competence** [Very high relevance=4, High relevance=3, Medium relevance =2, Low relevance=1]	**Existing level of competence** [Very high level=1, High level=2, Medium level =3, Low level=4]	**Priority score** [relevance score + existing level score]	**Capacity development possibility** (e.g., outsourced training, organizing special training programs, MoUs with local institutes, nominations for national training programs, mentoring/ coaching system)
Ability to use required technology such as GPS				
Management competencies				
Preparation of workplan and monitoring its implementation				
Financial and operational resources management				
Administrative documentation and reporting				
Assessment of capacity needs for each level of staff in the MPA				
Ensuring compliance with the legislation				
Preparation of monitoring and achievements reports on the MPA activities				
Strategic planning of the research projects in the MPA				
Coordinate and oversee research activities in the MPA				
Undertake assessment and monitoring of key biodiversity elements of the MPA (including coral, mangroves, seagrasses)				
Personal and social competencies				
Effective personal communication skills				
Meeting and workshop facilitation skills				
Negotiation skills (especially to deal with the local community and other departments active in and around the MPA)				
Diplomatic sensitivity				
Empathy with the people dependent on resources from the MPA				
Trustworthiness/ethics				

Types of competence	**Relevance of competence** [Very high relevance=4, High relevance=3, Medium relevance =2, Low relevance=1]	**Existing level of competence** [Very high level=1, High level=2, Medium level =3, Low level=4]	**Priority score** [relevance score + existing level score]	**Capacity development possibility** (e.g., outsourced training, organizing special training programs, MoUs with local institutes, nominations for national training programs, mentoring/ coaching system)
Proficiency in self-defense techniques				
Appreciation of nature				
Leadership competencies				
Organisational leadership and development				
Decision-making skills				
Result-orientation				
Problem solving skills				
Team leadership				
Skills to engage with stakeholders from other sectors and local coastal communities				
Conflict management skills				
Strategic thinking				
Strategic networking				

Annexure 10b- Assessment of priority competence development needs for senior staff responsible for planning and management of MPAs

Types of competence	**Relevance of competence** [Very high relevance=4, High relevance=3, Medium relevance =2, Low relevance=1]	**Existing level of competence** [Very high level=1, High level=2, Medium level =3, Low level=4]	**Priority score** [relevance score + existing level score]	**Capacity development possibility** (e.g., outsourced training, organizing special training programs, MoUs with local institutes, nominations for national training programs, mentoring/coaching system)
Technical / professional competencies				
Knowledge of Protected Area Policy, Planning				
Understanding of coastal and marine biodiversity basic science,				
Knowledge of key developments in the domain of coastal and marine biodiversity				
Understanding of legal framework visa-vis coastal ecosystems and enforcement requirements				
Ability to plan, manage and monitor activities for crime prevention, law enforcement and compliance.				
Ability to design awareness and education programmes				
Understanding of the socio-economic contexts of the coastal ecosystems				
Research and monitoring skills- include planning, implementation, and valuation of assessment and monitoring of required elements of biodiversity including coastal habitats, under-water surveys, identification of suitable indicators, etc				
Swimming skills				
Diving skills (mention the number of PADI/others certified staff)				
Ability to use required technology such as GPS				

Types of competence	Relevance of competence [Very high relevance=4, High relevance=3, Medium relevance =2, Low relevance=1]	Existing level of competence [Very high level=1, High level=2, Medium level =3, Low level=4]	Priority score [relevance score + existing level score]	Capacity development possibility (e.g., outsourced training, organizing special training programs, MoUs with local institutes, nominations for national training programs, mentoring/coaching system)
Management competencies				
Preparation of workplan and monitoring of the its implementation				
Financial and operational resources management				
Administrative documentation and reporting				
Assessment of capacity needs for each level of staff in the MPA				
Ensuring compliance with the legislation				
Preparation of monitoring and achievements reports on the MPA activities				
Strategic planning of the research projects in the MPA				
Coordinate and oversee research activities in the MPA				
Undertake assessment and monitoring of key biodiversity elements of the MPA (including corals, mangroves, seagrasses)				
Personal and social competencies				
Effective personal communication skills				
Meeting and workshop facilitation skills				
Negotiation skills (especially to deal with the local community and other departments active in and around MPA)				
Diplomatic sensitivity				
Empathy with the people dependent on resources from the MPA				
Trustworthiness/ethics				
Proficiency in self-defence techniques				
Appreciation of nature				

Types of competence	**Relevance of competence** [Very high relevance=4, High relevance=3, Medium relevance =2, Low relevance=1]	**Existing level of competence** [Very high level=1, High level=2, Medium level =3, Low level=4]	**Priority score** [relevance score + existing level score]	**Capacity development possibility** (e.g., outsourced training, organizing special training programs, MoUs with local institutes, nominations for national training programs, mentoring/coaching system)
Leadership competencies				
Organisational leadership and development				
Decision-making skills				
Result-orientation				
Problem solving skills				
Team leadership				
Skills to engage with stakeholders from other sectors and local coastal communities				
Conflict management skills				
Strategic thinking				
Strategic networking				

Annexure 11– A two-way matrix to determine which planning and/or management documents are addressing the key priority issues

	Highest priority pressures in MPA (transcribed from Annexure 5)				
List of management documents that exist for the MPA (from Annexure 8)	**List pressure 1**	**Pressure 2**	**Pressure 3**	**Pressure 4**	**Pressure 5**
Document 1 (insert doctitle)					
Document 2					
Document 3					
Document 4					
Document 5					
Document 6					
Document 7					
Document 8					

Annexure 12a– Template for status of management actions to address the prioritized values and threats in the MPA

Management action	Highest priority pressures in the MPA (transcribed from Annexure 6)				
	Pressure 1	Pressure 2	Pressure 3	Pressure 4	Pressure 5
Management actions already completed					
1					
2					
3					
Progress on actions that are expected to be completed within the next 12 months					
4					
5					
6					
7					
Progress on 'ongoing' management actions that will continually be delivered through ongoing management programs					
8					
9					
10					

Note: One management action might address one or more pressures.

Example of completing Annexure 12 - Status of management actions to address the prioritized values and threats in the MPA

Management action	Highest priority pressures in the MPA (transcribed from Annexure 6)				
	Overfishing	**Land-based pollution**	**Nearby salt extraction**	**Unsustainable tourism**	**Climate change**
Management actions already completed					
1. All tourist operations need a permit with conditions				Grater control on number of operators and where they can go	
2. Work with adjacent land uses to reduce impacts		Reduce level of polluted water flowing into MPA	Reduce level of super-saline water flows into MPA		Help build resilience in certain zones
3. Increase awareness of values of MPA and threats	Increase public awareness of impacts of overfishing	Increase public awareness of impacts of pollution	Increase public awareness of impacts of pollution		Increase awareness of climate change impacts
Progress on actions that are expected to be completed within the next 12 months					
4. Zoning to be completed for MPA	No-fishing zones				Zoning will help build resilience
5. Improvements in training tourist operators		Tourist operators improving public education about WQ impacts		Operators using best practice approaches	Tourist operators improving public education about climate change impacts
6. Appointment of Compliance officer	Will help address overfishing	Will help reduce pollution	Will help reduce pollution	Will help address unsustainable tourism	
Progress on 'ongoing' management actions that will continually be delivered through ongoing management programs					
7. Increase park patrols	Reduction in fishing effort in certain zones			Increased compliance by tourist operators	
8. Systematic water quality monitoring		Monitoring key pollution sources	Monitoring key pollution sources		
9. Increased liaison with local communities	Increase public awareness of impacts of overfishing	Increase public awareness of impacts of pollution	Increase public awareness of impacts of pollution		Increase awareness of climate change impacts

Annexure 12 b– Biophysical research and monitoring activities in the MPA

List of research and monitoring activities conducted in the past 5 years (including the dates of research)	Name of agency, organization or individual undertaking research or monitoring	Link/ reference to the research reports	Relevant prioritized values and threats
Biophysical research and/or monitoring activities undertaken by MPA staff			
Biophysical research and/or monitoring activities undertaken by non- MPA staff ((e.g., universities, NGOs)			

Annexure 12 c– Social and economic research and monitoring activities in the MPA

List of socio-economic research and monitoring activities conducted in the past 3 years (including the dates of research)	Name of agency, organization or individual undertaking research or monitoring	Link/ reference to the research reports	Relevant prioritized values and threats
Social and/or economic research and/or monitoring activities undertaken by MPA staff			
Social and/or economic research and/or monitoring activities undertaken by non-MPA staff (e.g., universities, NGOs)			

Annexure 13– Matrix of marine activities that may be appropriate for each IUCN management category

[Taken from Day et al (2012) 'Guidelines for Applying the IUCN Protected Area Management Categories to Marine Matrix Protected Areas']

Activities	Ia	Ib	II	III	IV	V	VI
Research (non-extractive)	Y*	Y	Y	Y	Y	Y	Y
Non-exractive traditional use	Y*	Y	Y	Y	Y	Y	Y
Restoration/enhancement for conservation (e.g., invasive control, coral reintroduction)	Y*	*	Y	Y	Y	Y	Y
Traditional fishing/collection in accordance with cultural tradition and use	N	Y*	Y	Y	Y	Y	Y
Non-extractive recreation (e.g., diving)	N	*	Y	Y	Y	Y	Y
Large-scale, low-intensity tourism	N	N	Y	Y	Y	Y	Y
Shipping (except as may be unavoidable under international maritime law)	N	N	Y*	Y*	Y	Y	Y
Problem wildlife management (e.g., shark control programs)	N	N	Y*	Y*	Y	Y	Y
Research (extractive)	N*	N*	N*	N*	Y	Y	Y
Renewable energy generation	N	N	N	N	Y	Y	Y
Restoration/enhancement for other reason (e.g., beach replenishment, fish aggregation, artificial reefs)	N	N	N*	N*	Y	Y	Y
Fishing/collection (recreational)	N	N	N	N	*	Y	Y
Fishing/collection (long-term and sustainable local fishing practices)	N	N	N	N	*	Y	Y
Aquaculture	N	N	N	N	*	Y	Y
Work (e.g., harbors, ports, dredging)	N	N	N	N	*	Y	Y
Untreated waste discharge	N	N	N	N	N	Y	Y
Mining (seafloor as well as sub-seafloor)	N	N	N	N	N	Y*	Y*
Habitation	N	N*	N*	N*	N*	Y	N*

Key:

No	N
Generally no unless special circumstances apply	N*
Yes	Y
Yes because no alternative, but special approval is essential.	Y*
* Variable; depends on whether this activity can be managed in such a way that it is compatible with the MPA.	*

IUCN category	Long term and sustainable local fishing/collecting practices	Recreational fishing/ collecting	Traditional fishing/ collecting	Collection for research
Ia	No	No	No	No*
Ib	No	No	Yes**	Yes
II	No	No	Yes**	Yes
III	No	No	Yes**	Yes
IV	Variable#	Variable#	Yes	Yes
V	Yes#	Yes	Yes	Yes
VI	Yes#	Yes	Yes	Yes

Key:

*	Any extractive use should be prohibited in MPAs, with possible exceptions for scientific research that cannot be done anywhere else.
**	In Category Ib, II and III MPAs, traditional fishing/collecting should be limited to an agreed sustainable quota when it is for traditional, ceremonial or subsistence purposes; fishing/collecting for commercial sale or trade should be prohibited.
#	Whether fishing or collecting is or is not permitted will depend on the specific objectives of the MPA.

Annexure 14– Some additional checklists for consideration when assessing MEE in MPAs

(adapted from Day and Laffoley 2006)

Resilience (no-take areas)	
Virtually no part, if any, of the area* is free from extractive activities or habitat-altering activities, or other significant human-induced stresses.	2.5
Only a small part the area* (<10%) is free from extractive activities or habitat-altering activities, or other significant human-induced stresses.	5
Between 10-30% or the area* is free from extractive activities or habitat-altering activities, or other significant human-induced stresses.	7.5
Your MPA network has been specifically designed so 30% or more of the area* is free from extractive activities or habitat-altering activities, or other significant human-induced stresses.	10
Your MPA network has been specifically designed to maximize the resilience of the network in the face of long-term geophysical and/or biochemical changes.	Bonus 12

Connectivity	
The design of your MPA network took little or no account of any known ecological processes known to occur in the area.*	2.5
Your MPA network was purposefully designed and does consider a few (one or more) of the known ecological processes (spatial and/or temporal) known to occur in the area.*	5
Your MPA network was purposefully designed and does consider some of the known ecological processes (spatial and/or temporal) known to occur in the area.*	7.5
Your MPA network has been purposefully designed to maximize all or most of the known ecological processes (spatial and/or temporal) known to occur in the area.*	10
Your MPA network has been purposefully designed to maximize and enhance most of the linkages between individual MPAs in the network.	Bonus 1

Spatial & temporal considerations	
Spatial and temporal issues were not considered in the design or in the ongoing implementation of your MPA network.	2.5
The design of your MPA network did consider one or more spatial or temporal issues; and some of these are still considered by managers in the ongoing implementation of the network.	5
The design of your MPA network did consider some spatial and temporal issues; and managers continue to consider each of these issues as part of ongoing implementation.	7.5
The design of your MPA network considered a wide range of spatial and temporal considerations, including ecological processes, connectivity and external influences; and managers continue to consider these as part of ongoing implementation.	10
There is good historical baseline information (or historic data) to determine whether there are 'shifting baselines' for a range of issues.	Bonus 12

Scientific research and monitoring considerations	
There is little or no scientific, social or economic information to support planning and management, or the available information is not used for decision-making.	2.5
There is limited scientific, social or economic information to support planning and management, but it is rarely used for decision-making.	5
There is some scientific, social and economic information to support planning and management, and whatever is available is used for decision-making.	7.5
All available scientific, social and economic information is used to support planning and management, and it is regularly updated and used for effective decision-making.	10
There is an ability to incorporate new information into subsequent planning or for ongoing management tasks.	Bonus 12

Economic & social considerations	
No consideration was given to the economic or socio-cultural setting, or to the benefits or costs, when your MPA network was initially designed, and little/no consideration is given during implementation.	2.5
Some consideration was given to the economic and socio-cultural setting, or to the benefits or costs, when your MPA network was initially designed.	5
The design and implementation of your MPA network initially considered the economic and socio-cultural setting, as well as the real benefits and costs of the network (and may have included tangible and intangible benefits and/or costs).	7.5
The design and implementation of your MPA network continues to consider the economic and socio-cultural setting, as well as the real benefits and costs of the network (including both tangible and intangible benefits and costs).	10
Your MPA network has addressed the need for structural adjustment or compensation for lost benefits from foregone economic opportunities.	Bonus 12

Adaptive management	
The MPA does not have management systems nor any monitoring arrangements to determine system responses and provide a basis for adaptive management; nor is it able to incorporate changes such as new information becoming available.	2.5
The MPA has very limited ability to incorporate some changes when new information becomes available, in a random fashion.	5
The MPA network has some ability to systematically incorporate some changes when new information becomes available.	7.5
The MPA network is readily able to incorporate changes such as new information becomes available (e.g., from 'in-the-field' experience, or as a result of changing external circumstances).	10
The MPA network has effective management systems that implement policies (i.e., specifying locally appropriate actions), as well as monitor arrangements to determine system responses and provide a sound basis for adaptive management.	Bonus 12

Permanence	
Your MPA network has little or no backing by way of any legislative instruments or administrative instruments, and its viability may be affected by any adverse activities occurring either within or adjacent to, the area.	2.5
Your MPA network has some backing by way of legislative instruments (e.g., statutes, laws, regulations) or administrative instruments (eg policies), but some of these may be varied by governments and/or ignored by officials.	5
Your MPA network has some legislative instruments (eg statutes, laws, regulations) and/or administrative instruments (e.g., policies) that collectively assist in protecting the MPA network.	7.5
Your MPA network has the backing of an efficient combination of legislative instruments (e.g., statutes, laws, regulations) and administrative instruments (e.g., policies) at various levels (local/state/national) that collectively provide long-term protection for the MPA network and ensure its viability.	10
Your MPA network has the backing of an efficient combination of legislative instruments that can extend outside the spatial domain of the MPA network if external threats need to be addressed.	Bonus 12

Public education, communication & awareness	
The community has little or no awareness of the MPA network or the managing agency.	2.5
Part of the community has some awareness of the MPA network, and the managing agency.	5
Most of the community has some awareness of the MPA network and the managing agency(or agencies).	7.5
Virtually the entire community (including the local communities and the wider public) is very familiar with the MPA network and the managing agency (or agencies).	10
The community (including the local communities and the wider public) is familiar with the objectives of the MPA network.	Bonus 12

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The GBRMPA webpages contains some useful information, including:

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