

Training Resource Material:
**Communicating Coastal and Marine Biodiversity
Conservation and Management Through the Media**

Module 3

Coastal and Marine Protected Areas

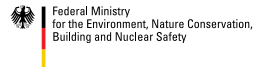
For Media Professionals, Students and Trainers



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Wildlife Institute of India

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Curriculum on
**Communicating Coastal and Marine Biodiversity
Conservation and Management Through the Media**

Module 3 Coastal and Marine Protected Areas

For Media Professional, Students and Trainers

Summary

This module provides the much needed information on marine protected areas (MPAs), the differences between MPAs and terrestrial protected areas, the categories and types of MPAs and their management systems and an overview of the elements of management effectiveness. This module covers the key issues of fisheries and indigenous communities in the context of MPAs. Apart from providing information on different types of MPAs in India and their locations, the module elaborates benefits of and challenges for MPAs.

Imprint

Training Resource Material: **Communicating Coastal and Marine Biodiversity Conservation and Management Through the Media**

- Module 1: Introduction to biodiversity and ecosystem services
- Module 2: Setting the context: Why are the coasts important?
- Module 3: Coastal and marine protected areas
- Module 4: Governance, law and policy framework for coastal and marine biodiversity
- Module 5: Why do we not hear more about the coast?
- Module 6: Mainstreaming coastal and marine biodiversity into overall development and environmental planning
- Module 7: Interlinkages between coastal and marine biodiversity, climate change, natural disasters and coastal livelihoods

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Acronyms

CBD	Convention on Biological Diversity
CCAMLR	Commission on the Conservation of Antarctic Marine Living Resources
CRZ	Coastal Regulation Zone
EEZ	Exclusive economic zone
FSI	Forest Survey of India
GEC	Gujarat Ecology Commission
GOM	Gulf of Mannar
GOMNP	Gulf of Mannar National Park
IBA	Important Bird Area
ICCAs	Indigenous peoples and community conserved territories and areas
ICMAM	Integrated coastal and marine area management
ICMBAs	Important Coastal and Marine Biodiversity Areas
IUCN	International Union for Conservation of Nature
LMMA	Locally managed marine area
MMS	Malvan Marine Sanctuary
MPA	Marine protected area
MTHL	Mumbai Trans Harbour Link
PA	Protected area
SAC	Space Applications Centre
SCME	Sindhudurg Coastal and Marine Ecosystem
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Programme
WCMC	World Conservation Monitoring Centre
WDPA	World Database on Protected Areas
WII	Wildlife Institute of India

Learning outcomes

After completing this module, the participants are able to:

- explain the term ‘protected area’ and describe the different types of protected areas
- differentiate between the key characteristics and factors governing a terrestrial protected area and a marine protected area
- describe different types of management models for MPAs and challenges associated with each
- debate on the sustainability of fishing practices in and around MPAs.

Key messages

1. A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, is mandatory to achieve the long-term conservation of nature with associated ecosystem services and cultural values.
2. One of the most effective means for protecting marine and coastal biodiversity is through the establishment and proper management of marine protected areas (MPAs). MPAs have many different types of protection. Some are ‘no-take zones’ or ‘protected zones’ that are essential to enable fish stocks to recover while others allow multiple use of their resources. MPAs protect key ecosystems such as coral reefs. Not only do they act as safe breeding ground for fish but they can also generate tourism, which in turn brings jobs. Creating more community managed MPAs would enhance the flow of benefits to local people.
3. India has designated four legal categories of PAs—national parks, wildlife sanctuaries, conservation reserves and community reserves. India has created a network of PAs representing all its 10 biogeographic regions. A total of 702 PAs have been established, comprising 103 national parks, 530 wildlife sanctuaries, 65 conservation reserves and 4 community reserves, and 26 wetlands have been designated as Ramsar sites.
4. In India, PAs that fall—in whole or in part—within a swath of width 500 m along the high tide line are included in the MPA network. Based on this definition, there are 24 MPAs in peninsular India and more than 100 MPAs in its islands. The Gulf of Mannar Marine National Park, Sundarbans National Park, Gulf of Kachchh National Park, Bhitarkanika National Park, Coringa Wildlife

Sanctuary and Chilika Wildlife Sanctuary have unique marine biodiversity and provide a range of services to local communities.

5. MPA managers face a wide range of challenges, from insufficient funding and support to non-cooperation from local communities. Good communication and awareness programmes, and involvement of the local communities in the management of MPAs would help generate sustainable livelihoods through revenue from fishing and tourism.
6. Under an Ecosystem Approach to Fisheries, the usual concern of fisheries managers – the sustainability of targeted species – is extended to address the sustainability of ecosystems upon which the fisheries depend, which include people and fish stocks.
7. Ecosystem Approach addresses both human and ecological well-being and merges two paradigms: protecting and conserving ecosystem structure and functioning; and fisheries management that focuses on providing food, income and livelihoods for humans.
8. The main challenges facing marine fisheries development in the country include development of sustainable technologies for capture fisheries, yield optimization, infrastructure for harvest and post-harvest operations, landing and berthing facilities for fishing vessels and uniform registration of fishing vessels.
9. Artisanal fishing (or small-scale fisheries), uses small inshore vessels and/or fixed gear (e.g., coastal traps, gill nets and cast nets) and whose purpose is to catch fish and other organisms for their own consumption and sale. Commercial fishing is the activity of catching fish and other seafood for commercial profit, mostly from wild fisheries. It provides a large quantity of food to many countries around the world, but those who practice it as an industry must often pursue fish far into the ocean under adverse conditions. Large-scale commercial fishing is also known as industrial fishing.

Key terms

Marine protected areas; participatory management; stakeholders' consultation; marine biodiversity, fisheries management, ecosystem approach to fisheries.

3.1 What are protected areas?

Protected areas (PAs) have been used to manage natural resources for biodiversity conservation and for the well-being of people dependent on these resources. They are widely regarded as one of the most successful measures implemented for the conservation of biodiversity, drawing upon traditional and community-based approaches, governance regimes, scientific and traditional knowledge and contemporary practices of governments and conservation agencies (IUCN).

The IUCN defines a PA as a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.

As per Aichi Biodiversity Target 11, 17 per cent of the terrestrial ecosystems and 10 per cent of the marine ecosystems need to be protected globally to safeguard the biodiversity and the dependent communities in the future.

Table 1: Definition and primary objectives of IUCN PA Categories (Dudley 2008)

IUCN category	Definition	Primary objective	Designation in India
Ia	<i>Category Ia: Strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphological features, where human visits, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such PAs can serve as indispensable reference areas for scientific research and monitoring.</i>	To conserve regionally, nationally or globally outstanding ecosystems, species (occurrences or aggregations) and/or geodiversity features—these attributes will have been formed mostly or entirely by non-human forces and will be degraded or destroyed when subjected to all but very light human impact.	National park

IUCN category	Definition	Primary objective	Designation in India
Ib	<i>Category Ib PAs: Usually large, unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitations, which are protected and managed so as to preserve their natural condition.</i>	To protect the long-term ecological integrity of natural areas that are undisturbed by significant human activity and free of modern infrastructure, where natural forces and processes predominate, so that current and future generations have the opportunity to experience such areas.	Wildlife sanctuary
II	<i>Category II PAs: Large natural or near-natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities.</i>	To protect natural biodiversity along with its underlying ecological structure and supporting environmental processes, and to promote education and recreation.	Wildlife sanctuary
III	<i>Category III PAs: Set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, cave or even a living feature such as an ancient grove. These PAs are generally quite small and often have high visitor value.</i>	To protect specific outstanding natural features and their associated biodiversity and habitats.	Wildlife sanctuary

IUCN category	Definition	Primary objective	Designation in India
IV	<i>Category IV PAs: Aim to protect particular species or habitats; management reflects this priority. Many category IV PAs will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.</i>	To maintain, conserve and restore species and habitats.	Conservation reserve/community reserve
V	<i>Category V PAs: Where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.</i>	To protect and sustain important landscapes/ seascapes and the associated nature conservation and other values created by interactions with humans through traditional management practices.	Conservation reserve/community reserve
VI	<i>Category VI PAs: Conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.</i>	To protect natural ecosystems and use natural resources sustainably, when conservation and sustainable use can be mutually beneficial.	Conservation reserve/community reserve

IUCN - World Database on Protected Areas

The World Database on Protected Areas (WDPA) is the most comprehensive global database of marine and terrestrial protected areas and is one of the key global biodiversity datasets being widely used by scientists, businesses, governments, International secretariats and others to inform planning, policy decisions and management.

The WDPA is a joint project between the United Nations Environment Programme (UNEP) and the International Union for Conservation of Nature (IUCN). The compilation and management of the WDPA is carried out by UNEP World Conservation Monitoring Centre (UNEP-WCMC), in collaboration with governments, non-governmental organisations, academia and industry. There are monthly updates of the data which are made available online through the Protected Planet website where the data is both viewable and downloadable.

Source: *Explore the World of Protected Areas: <http://www.protectedplanet.net/>*

Global Forest Watch

Global Forest Watch (GFW) is an interactive online forest monitoring and alert system designed to empower people everywhere with the information they need to better manage and conserve forest landscapes. GFW provides timely and precise information about the status of forest landscapes worldwide, including near-real-time alerts showing suspected locations of recent tree cover loss. GFW is free and simple to use, enabling anyone to create custom maps, analyze forest trends, subscribe to alerts, or download data for their local area or the entire world.

Source and further information: <http://www.globalforestwatch.org/>

The Digital Observatory for Protected Areas (DOPA)

The Digital Observatory for Protected Areas (DOPA) is a set of web services and applications that can be used primarily to assess, monitor, report and possibly forecast the state of and the pressure on protected areas at multiple scales. The data, indicators, maps and tools provided by the DOPA are relevant to a number of end-users including policy makers, funding agencies, protected area agencies and managers, researchers and the Convention on Biological Diversity (CBD).

Source and further information: <http://dopa.jrc.ec.europa.eu/>





3.2 Marine and coastal protected areas (MPAs)

3.2.1 Basic definition and its explanation

As defined by the IUCN, ‘... a marine protected area is any area of the intertidal or sub-tidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment’ (Kelleher 1999).

In India, PAs that fall—in whole or in part—within a swath of 500 m width along the high tide line, are included in the MPA network. On the basis of this definition, there are 24 MPAs in peninsular India and more than 100 MPAs in the country’s islands.

The MPA network is still in its infancy. As of 2014, 6594 MPAs have been established around the world, which cover 2 per cent of total marine areas.

The latest update to the Protected Planet Report 2016 shows that there are now just under 15,000 Marine Protected Areas (MPAs) spread across 18.5 million square kilometres of ocean and sea. Up to 13% of territorial waters are now protected.

<https://www.protectedplanet.net/>

Table 2: Explanation of PAs

Phrase	Explanation provided in 2008 guidelines lines	Discussion and example of application in the marine realm
Clearly defined	In Australia’s Great Barrier Reef Marine Park, the boundary is clearly defined by legal proclamation. The zones in the GBRMP are legally defined in the statutory zoning plan. The MPA goes to a depth of 1000 m below the seabed and a height of 915 m (airspace) above the surface of the water.	This implies that MPAs must be mapped and have boundaries that are legally defined. However, while some MPAs can be clearly defined (e.g., an entire bay bounded by headlands), for others it may be difficult to mark the boundaries, especially if the MPA is offshore. Even boundaries on the landward side, where tide levels can be used (e.g., low-water mark), can be difficult to establish. Increasingly, MPA or zone boundaries are defined by high resolution latitude and longitude coordinates, as determined by modern GPS instruments.

Phrase	Explanation provided in 2008 guidelines lines	Discussion and example of application in the marine realm
Geographical space	Includes land, inland water, marine and coastal areas or a combination of two or more of these. 'Space' has three dimensions, e.g., as when the airspace above a PA is protected from low-flying aircraft or in MPAs where a certain water depth is protected or the seabed is protected but water above is not; conversely subsurface areas sometimes are not protected (e.g., are open for mining).	<p>All PAs exist in three dimensions, but the vertical dimension in MPAs is often a substantial management consideration. In MPAs, management may need to address the airspace above the sea surface, the actual water surface, the water column (or parts of it), the seabed and the sub-seabed, or just one or a combination of two or more of these elements. For example, some MPAs protect just the seabed/benthos and not the water column above. It is therefore important that an MPA has a clear description of the dimensions that are actually protected.</p> <p>Examples:</p> <ul style="list-style-type: none"> In Australia's Great Barrier Reef Marine Park, the boundary is clearly defined by legal proclamation. The zones in the GBRMP are legally defined in the statutory zoning plan. The MPA goes to a depth of 1000 m below the seabed and a height of 915 m (airspace) above the surface of the water
Recognized	Implies that protection can include a range of governance types declared by people as well as those identified by the state but that such sites should be recognized in some way (in particular through listing on the World Database on Protected Areas (WDPA)).	<p>Example:</p> <ul style="list-style-type: none"> The Government of Canada and the Council of the Haida Nation comanage Gwaii Haanas National Park Reserve and Haida Heritage Site and the Gwaii Haanas National Marine Conservation Area Reserve off the Pacific coast of Canada.

Phrase	Explanation provided in 2008 guidelines lines	Discussion and example of application in the marine realm
Dedicated	<p>Implies specific binding commitment to conservation in the long term through, e.g., the following:</p> <ul style="list-style-type: none"> • international conventions and agreements • national, provincial and local law • customary law • covenants of NGOs • private trusts and company policies • Certification schemes 	<p>Examples:</p> <p>The Galápagos Marine Reserve is designated</p> <ul style="list-style-type: none"> • under national law and is also an integral part of the • Galápagos Islands World Heritage Site. • Vueti Navakavu in Fiji is a locally managed marine area (LMMA) established by the community and declared through local cultural protocol systems.
Managed	<p>Assumes some active steps to conserve the natural (and possibly other) values for which the PA was established; note that ‘managed’ can include a decision to leave the area untouched if this is the best conservation strategy.</p>	<p>The requirement that a site is managed applies to both marine and terrestrial situations. As on land, many types of MPA management are possible.</p> <p>Example:</p> <ul style="list-style-type: none"> • Bonaire National Marine Park in the Netherlands Antilles has clearly defined regulations that apply to all users of the park.
Legal or other effective means	<p>PAs must either be gazetted (i.e., recognized under statutory civil law), recognized through an international convention or agreement, or else managed through other effective but non-gazetted, means, such as through recognized traditional rules under which community-conserved areas operate or the policies of established non-governmental organizations.</p>	<p>As for terrestrial PAs, ‘effective means’ include agreements with indigenous groups.</p> <p>Example:</p> <ul style="list-style-type: none"> • Dhimurru Indigenous Protected Area, an area of land and sea in the Northern Territory of Australia, on the Gulf of Carpentaria, is run by the Dhimurru Land Management Aboriginal Corporation, which works with the traditional owners to manage the PA.

Phrase	Explanation provided in 2008 guidelines lines	Discussion and example of application in the marine realm
... to achieve	Implies some level of effectiveness—a new element that was not present in the 1994 definition but which has been strongly requested by many PA managers and others. Although the category will still be determined by objective management, effectiveness will progressively be recorded on the WDPA and over time will become an important contributory criterion in identification and recognition of PAs.	<p>As for terrestrial PAs, this implies some level of effectiveness and therefore requires that the MPA is subject to monitoring, evaluation and reporting.</p> <p>Example:</p> <ul style="list-style-type: none"> The assessment of management effectiveness of the Aldabra World Heritage Site in the Seychelles, undertaken as part of the Enhancing our Heritage project with the UNESCO World Heritage Centre, provides information on the extent to which the objectives of this MPA are being achieved.
Long term	PAs should be managed in perpetuity and not as short-term or a temporary management strategy.	<p>As with terrestrial PAs, long-term protection (over timescales of human generations) is necessary for effective marine conservation. Seasonal closures of an area for a specific purpose (such as fish spawning, whale breeding, etc), in the absence of any additional biodiversity protection and any primary nature conservation objective, are not considered to be MPAs.</p>
		<p>Seasonal protection of certain species or habitats may be a useful component of management in an MPA.</p> <p>Examples:</p> <ul style="list-style-type: none"> In the Marine Mammal Protection Zone of the Great Australian Bight Marine Park (Commonwealth Waters) the use of vessels is prohibited from 1 May – 31 October each year to protect an important calving and breeding area for southern right whales.

Phrase	Explanation provided in 2008 guidelines lines	Discussion and example of application in the marine realm
Conservation	<p>In the context of this definition, conservation refers to the in situ maintenance of ecosystems and natural and seminatural habitats and of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.</p>	<p>Examples:</p> <ul style="list-style-type: none"> • Ecological reserves in the Florida Keys National Marine Sanctuary in the United States are designed to provide natural spawning and nursery areas for the replenishment and genetic protection of marine life and aim to protect and preserve all habitats and species found throughout the sanctuary. • The inclusion of a minimum of 20 per cent of all 70 bioregions within Australia's Great Barrier Reef Marine Park is designed to provide in situ protection of representative examples of all species and ecosystem processes.
Nature	<p>In this context, 'nature' always refers to biodiversity at the genetic, species and ecosystem levels, and often also refers to geodiversity, landform and broader natural values.</p>	<p>All PAs, whether terrestrial or marine, should aim to protect all the features of conservation importance within their boundaries.</p> <p>Example:</p> <ul style="list-style-type: none"> • The overall objective of the Great Barrier Reef Marine Park is to provide for the long-term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef Region.

Phrase	Explanation provided in 2008 guidelines lines	Discussion and example of application in the marine realm
Associated ecosystem services	<p>Refers to ecosystem services that are related to but do not interfere with the aim of nature conservation. These can include provisioning services such as food and water; regulating services such as regulation of floods, drought, land degradation, and disease; supporting services such as soil formation and nutrient cycling and cultural services such as recreational, spiritual, religious and other nonmaterial benefits.</p>	<p>MPAs provide a wide range of ecosystem services:</p> <p>Examples:</p> <ul style="list-style-type: none"> • Ecosystem services: The MPA network in Belize has been estimated to contribute nearly US\$20 million annually in reef-related visitor expenditure. • Regulating ecosystem services, for example seagrass meadows, mangroves and kelp forests as carbon sinks: The four MPAs designated by the Malta Environment and Planning Authority to protect Malta's Posidonia (seagrass) beds together protect over 80 per cent of this habitat in Malta. <p>Areas set up for wave/wind power are generally not MPAs</p>
Cultural values	<p>Includes those that do not interfere with the conservation outcome (all cultural values in a PA should meet this criterion), including in particular:</p> <ul style="list-style-type: none"> • Those that contribute to conservation outcomes (e.g., traditional management practices on which key species have become reliant) • Those that are themselves under threat. 	

3.2.2 What is not an MPA?

A protected area as defined by IUCN describes a precise set of management approaches with limits, and must have nature conservation as a primary rather than a secondary aim.

Therefore, following types of management areas are not necessarily MPAs:

- Temporary or permanent fishing closures that are established primarily to help build up and maintain reserve stocks for fishing in the future, and have no wider conservation aims or achievements are not considered to be MPAs. For such sites to meet IUCN's definition of a PA, managers would need to address the overall health and diversity of the ecosystem and have a stated primary aim to this effect. Such areas, however, may be important components in the management of an MPA. For example, seasonal closures of fish spawning aggregation areas or pelagic migratory routes, at specific and predictable times of the year for certain species when they are extremely vulnerable, may be essential to the effective management of an MPA.
- Community areas managed primarily for sustainable extraction of marine products, e.g. fish.
- Marine and coastal management systems managed primarily for tourism, even where these also include areas of conservation interest.
- Wind farms and oil platforms that incidentally help to build up biodiversity around underwater structures by excluding fishing and other vessels.
- Marine and coastal areas set aside for other purposes but which have an indirect conservation benefit: military training areas or their buffer areas (e.g. exclusion zones); disaster mitigation (e.g. coastal defences that also harbour significant biodiversity); communications cable and pipeline protection areas; shipping lanes, etc.
- Large areas (e.g., regions, provinces, countries) where certain species are protected by law across the entire region.

Case Story: Spanish fishermen fight for MPAs

After years of overfishing, illegal fisheries and the consequences of a big oil spill caused by a ship accident, the fishermen's association (COFRADIA) of Lira, a small town in the coast of Galicia (northwestern Spain), has pioneered a co-management initiative in the region by proposing the creation of a marine reserve.

The proposal was designed and developed by the fishers in partnership with biologists, social scientists, environmentalists and members of the autonomous government of Galicia in a highly participatory process. The views of different stakeholders on the implementation process for the marine reserve were assessed through a programme of semistructured interviews. These findings were also used to analyse issues related to the implementation process, employing a governance analysis framework.

It was observed that the inclusion of fishers in the decision-making and the use of their traditional ecological knowledge in the design of the reserve promoted a better understanding of its benefits and an improved compliance with the fishing regulations. The effectiveness of the marine reserve was very high during the first years but it has been recently undermined due to the reduction of State financial support for enforcement in the light of the current economic recession in Spain. Though this marine reserve is driven by the stakeholders, the prospects depend on an adequate state enforcement capacity.

Source: *de Oliveira, L.P. 2013.*

3.2.3 Indigenous people and community-conserved territories and areas (ICCAs)

Indigenous peoples and community conserved territories and areas (ICCA) are defined by IUCN as ‘natural and/or modified ecosystems containing significant biodiversity values, ecological functions and benefits, and cultural values voluntarily conserved by indigenous peoples and local communities both sedentary and mobile—through customary laws or other effective means.’

Determining when an ICCA is also a PA, and therefore eligible for listing on the World Database of Protected Areas (WDPA), is more complex than for some other PA governance types and has two stages:

- **Agreement by the indigenous people or community involved:** no community-managed site should be identified as a PA or listed on the WDPA without express consent by the community. Recognition and listing can bring benefits but also costs, such as increased exposure.
- **Alignment with the IUCN definition of a PA:** the 2008 definition of a PA stipulates that for a site to be a PA, priority must be given to nature conservation; other values present may be of similar importance, but in the event of conflict between values, nature conservation must be considered the most important. As is the case with other governance types, community areas managed primarily for sustainable extraction of marine products will not be considered PAs according to the IUCN definition unless nature conservation is the primary stated objective of the management regime.

Many ICCAs have been established by coastal communities in marine ecosystems. The ICCA Registry website is an online information portal and secure database, developed by UNEP-WCMC with support from UNDP's GEF Small Grants Programme, that documents indigenous and community conservation areas, including in the marine environment.

It aims to increase awareness of the biodiversity values of areas managed by communities and provide information on a wide range of aspects. As part of this process, it is hoped that further guidance on implementing the IUCN categories in terrestrial and marine ICCAs will be developed. Additional information is available through the ICCA Consortium, and the primary reference for determining whether a marine community conservation area is an MPA will be the 2008 Guidelines.

Source: <http://www.iccaregistry.org/>

The IUCN definitions of 'protected area' and management categories are neutral about the type of ownership or management authority. With respect to who holds decision-making and management authority and responsibility for protected areas, IUCN distinguishes four broad governance types—governance by governments, shared governance, private governance and governance by indigenous people and local communities—which are described in the 2008 Guidelines. All combinations of protected area categories and governance types are possible in an MPA. IUCN suggests that the governance type of a protected area be identified and recorded at the same time as its category in national environmental statistics and accounting systems and in protected area databases.

Case Story: Combination of indigenous and scientific knowledge for Fiji's marine biodiversity

Fish workers and scientists have worked hand in hand on an assessment of changes in the occurrence and abundance of over 1000 species that have occurred over the past 50 years within the fishing grounds of Vanua Navakavu in the Fiji Islands.

The assessment was based on a comparison of time–depth testimonies of surviving older male and female fishers with results from more recent surveys in an effort to record and correlate observed changes with factors such as intense overfishing, use of fish poisons, increased pollution, a 1953 tsunami and the establishment of locally managed marine areas in 1991.

At present, local vernacular names for over 1000 species have been recorded and the recovery status of almost 900 assessed. Results show that the successful restriction of fish poisons, dynamite fishing, and small-mesh gill netting, combined with the establishment of a successful MPA, seems to be largely responsible for the return and increasing abundance of many species not seen for decades.

The basis for this success was a partnership of local fishworkers and communities who had personally witnessed and been involved in the collapse of their fisheries, with the Fiji national and provincial government agencies, NGOs, private industry, the University of the South Pacific and international funders. More than 200 villages have entered the Fiji Locally Managed Marine Areas Network. They can see impressive improvements in reef ecosystems and gains in marine biodiversity.

Source: *UNESCO*





3.3 Where are the MPAs located in India?

India has a vast coastline of 7517 km, of which an extent of 5423 km is in peninsular India and 2094 km in the Andaman, Nicobar and Lakshadweep Islands. The coastline also supports a huge human population, which is dependent on the rich coastal and marine resources.

It is estimated that nearly 250 million people live within a 50 km wide swath along the coastline of India. Therefore, the ecological services of marine and coastal ecosystems of India play a vital role in India's economic growth. India represents 2.5 per cent of the world's landmass and supports a population of over 1 billion people. India is also one of 17 mega biodiverse countries in the world, with 7.8 per cent of the recorded species of the world, including 45,500 recorded species of plant and 91,000 recorded species of animal.



Figure 1: Location of MPAs in India

In India, PAs that fall entirely or partly within a swath extending 500 m from the high tide line are considered to be in the MPA network. On the basis of this definition, India has designated four legal categories of PAs: national parks, wildlife sanctuaries, conservation reserves and community reserves.

India has designated four legal categories of PAs and created a network of PAs representing all its 10 biogeographic regions. A total of 730 PAs have been established, comprising 103 national parks, 535 wildlife sanctuaries, 66 conservation reserves and 26 community reserves, and 26 wetlands have been designated as Ramsar sites. [Source: ENVIS Centre on Wildlife & Protected Areas website <http://wiienvis.nic.in/>]

There are 25 MPAs in peninsular India and about 106 MPAs in its islands. The Marine National Park Jamnagar, Gulf of Mannar Marine National Park, Sundarbans National Park, Gulf of Kutchch National Park, Bhitarkanika National Park, Coringa Wildlife Sanctuary and Chilika Wildlife Sanctuary, in peninsular India, have unique marine biodiversity and provide a range of services to local communities around them. The latest addition is the Thane Creek Flamingo Sanctuary in Maharashtra.

The 24 MPAs of the mainland have a total area of about 8214 km², which is about 5 per cent of the total PA network of India and represents 0.25 per cent of the total geographic area of the country. Dedicated efforts are required to secure and strengthen community participation in managing the MPA network in India.

India has taken several steps for achieving Aichi Biodiversity Targets, especially Target No. 11 (at least 10 per cent of coastal and marine areas are conserved in networks of PAs) and Target No.14 (ecosystems that provide water, health, livelihoods and well-being are restored and safeguarded). Towards achieving these two targets, 106 coastal and marine sites have been identified and prioritized as Important Coastal and Marine Biodiversity Areas (ICMBAs). [Visit the ENVIS website to explore further or click this link http://wiienvis.nic.in/Database/ICMBAs_8247.aspx]

India has also identified 12 trans-boundary PAs under the framework of the IUCN Transboundary PA Programme. Two of these sites, namely, the Sundarbans Tiger Reserve and Gulf of Mannar Biosphere Reserve, are MPAs. India has also designated five UNESCO World Heritage Natural sites, including the Sundarbans National Park.







3.4 Why do we need MPAs to conserve the oceans?

Fish, algae, nutrients, pollutants and much else move freely in the water column in oceans. There are few natural boundaries in the oceans. Setting up an MPA will not stop fish moving out or prevent pollutants moving in. Then why should MPAs be managed?

3.4.1 A summary of the major benefits of MPAs

- Protect ecosystem structure and functioning, allowing recovery from past damage, and serving as stepping stones for migratory/dispersive species.
- Protect the genetic variability of exploited species.
- Improve fishery yields by protecting spawning stocks, enhancing recruitment and reducing overfishing of vulnerable species.
- Provide other direct and indirect social and economic benefits, such as attracting tourists, to traditional users of biodiversity, preserve reefs which prevent wave erosion of the shore and shelter moorings.
- Provide opportunities for the public to enjoy natural or relatively natural marine environments, for public education and to allow the public to develop an understanding of the effects of humans on the marine environment.

More than 90 per cent of the world's carbon dioxide is stored in the oceans, and they remove 30 per cent of the carbon dioxide released to the atmosphere. MPAs, which often encompass 'barrier' or 'bioshield' ecosystems such as coral reefs or mangroves, can also reduce the impact of damage from natural disasters such as hurricanes. Waves are slowed by the reefs while mangroves are effective windbreaks that reduce soil erosion.

Close to 25 per cent of fishing in developing countries is carried out near a coral reef and more than 70 per cent of the world's fisheries are in danger. Studies have shown that the knock-on effect of 'no take' MPAs not only doubles the amount of fish but also their size in a very short period of time. The global MPA network, including in the High Seas, are key to replenishing biodiversity and nourishing the growing human population. They also serve as nurseries for key threatened species including whales and turtles whilst protecting a variety of marine ecosystems and the rich biodiversity they sustain. Furthermore, global networks of MPAs provide 'stepping stones' for migratory species.

3.4.2 Major benefits of MPAs for management of fisheries

- producing fish of exploitable size, which then directly disperse/'spill over' into the surrounding area where they become available to fishers
- producing more offspring (from a greater density of breeding adults within MPAs) which are then dispersed by currents to eventually recruit into surrounding fisheries
- providing information that is necessary to make regulatory decisions about controls (e.g., measures of natural mortality, reproduction, maximum size, trophic interactions)
- providing insurance against resource management mistakes outside MPAs by providing a refuge from the collection of organisms (e.g., corals, sponges, aquarium fish), and from fishing and making overfishing more difficult
- providing insurance by preserving populations.

Presently, only about 1 per cent of the global ocean is protected. There has been a worldwide collapse in fisheries and attendant environmental damage and disruption to ecosystem structure and function. There have been many global calls to create many more MPAs. The World Sum-

mit on Sustainable Development, the World Parks Congress and the Convention on Biological Diversity have all committed to goals of establishing a global network of MPAs, including on the high seas.

An effective MPA system is needed to ensure that the oceans recuperate and continue to store carbon dioxide, fish stocks recover and coastlines are protected from harsh climatic conditions. It is no longer a technical question but a matter of survival for the planet and humankind. Some existing and proposed MPAs have been criticized by local communities as impinging on land usage rights. This criticism is stronger in developing countries. Therefore, securing and strengthening community participation in the management of MPAs is the need of the hour.

As these pressures intensify, MPAs are increasingly recognized as a critical management tool to protect, maintain, and restore natural and cultural resources in coastal and marine waters. A network of MPAs, elimination of destructive fishing practices, and the implementation of ecosystem-based management could help meet the global goal of maintaining or restoring fisheries stocks to levels that can produce the maximum sustainable yield.

3.5 Challenges in managing coastal and marine biodiversity and MPAs

Protected Area managers face a wide range of challenges, from insufficient funding and support, to antagonism from local communities. With good communication and awareness programmes, this trend could be reversed. Involving the local population in the protection of marine protected areas would help generate sustainable livelihoods through revenue from fishing and tourism.

3.5.1 Characteristics of marine ecosystems

Key aspects of the marine and coastal environment that are relevant to MPAs:

- Ocean and coastal environments cover most of the earth and contain all marine biodiversity. All the 29 known phyla of free-living, multicellular animals are known to have occurred in the ocean and 14 are known only from the oceans.
- Most marine organisms in offshore waters are very sensitive to ‘unknown’ disturbances and pollution, especially as they are physiologically ‘open systems,’ not well protected against external harmful agents.

Marine and coastal environments are three-dimensional and highly dynamic in space and time. Primary productivity is often accomplished by small, mobile organisms. Marine food webs are in general more complex than terrestrial food webs. There are strong linkages between the pelagic and benthic components, as well as between the land and nearshore waters. All of these characteristics make the understanding of marine biodiversity, and its management, more complex and difficult. Most marine organisms have at least one free-swimming or floating stage in the life cycle, enabling wide dispersal. It is not possible to physically enclose the marine portion of MPAs. This has the advantage of allowing dispersal from the MPAs to enhance biodiversity in the surrounding areas

(‘stepping stone’ function), but carries the substantial disadvantage that the MPA is strongly affected by ‘upstream’ events, for example, water quality and sedimentation.

- Human exploration of these areas is difficult, and so we cannot easily observe and measure what is happening. Our knowledge of marine biodiversity is poor (e.g., new species are constantly being discovered), as is our knowledge of the way in which marine ecosystems and processes operate.

Acquisition of new information is generally a good deal more expensive and requires more sophisticated equipment than terrestrial equivalents.

Environmental degradation is less easily observed by both scientists and others than on land, making it more likely that degradation will need to reach a catastrophic level before it is recognized and addressed. It also makes gaining political and public support for measures such as MPAs more difficult.¹

1 Vallega, A. 1999. *Fundamentals of Integrated Coastal Management*. Kluwer, Dordrecht, The Netherlands.

3.5.2 Characteristics of the marine environment that affect MPAs

The marine environment has particular characteristics that are often absent or relatively uncommon on land. As a result, MPAs present management challenges that may need different approaches from those used for PAs in terrestrial environments.

Characteristic	How does this characteristic affect MPAs?
Multidimensional environment	MPAs are designated in a fluid multidimensional environment. As a result, in some cases, different types of management may be needed at different depths. In some MPAs vertical zoning has been used to achieve this. In others, there may be no vertical zoning, but the management put in place may nevertheless vary with the depth of water. The sub-seafloor may also need management, if there is a potential impact such as mining below the seabed. This is similar to the situation in terrestrial PAs, where activities such as mining might potentially impact the PA below the ground.
Currents and tides causing flows/impacts	MPAs are subject to surrounding and 'up-current' influences from tides and currents. These are generally outside the control of the manager or management agency and cannot be managed. Although similar to the situation of airborne or wind-borne impacts on terrestrial PAs, MPAs are perhaps more consistently subject to such influences.
Lack of clear tenure or ownership	Tenure and ownership in the marine environment is often different from those on land, where there is usually clear public or private ownership. Under the United Nations Convention on the Law of the Sea (UNCLOS), nations have the right to use their Exclusive Economic Zones (EEZs), which extend from shore out to 200 nautical miles, and to establish management regimes such as MPAs. However, within an EEZ, there is generally no individual ownership of either the seabed or water column, and the EEZ may often be used and accessed by all those belonging to the nation concerned. Outside the EEZs, that is, on the high seas, the oceans are invariably considered to be 'commons' which may be used and accessed by all nations. MPAs can represent a legitimate restriction on such rights under the UNCLOS or Regional Sea Agreements, according to provisions of the Convention on Biological Diversity (CBD) or Regional Fisheries Agencies.
Multiple jurisdictions	Often, the water column, seabed, sea life and foreshore are managed by different jurisdictions or government agencies, which may create difficulties for designation and management.

Characteristic	How does this characteristic affect MPAs?
Difficulties in enforcement and management	Restricting entry to, and activities in, an MPA is often more difficult than for terrestrial PAs (and often impossible) as there are usually multiple access points, the site is often remote and thus difficult and expensive to patrol, and under international law, rights of ‘innocent passage’ are afforded to all vessels. While controlling activities in the marine environment is more difficult than on land, modern satellite technology is making it easier.
Lack of visibility of features being protected	Being unable to see sub-tidal features poses particular problems in terms of management and enforcement. Illegal or unregulated activities may damage features within an MPA without anyone knowing, unless appropriate monitoring or surveillance is undertaken (and this may be expensive, requiring scuba diving).
Boundary demarcation	It is often difficult to know where the boundary of an MPA is, both seawards (where electronic charts, a global positioning system (GPS) or similar technologies are needed), and on the landward side where boundaries based on high and low water marks may be difficult to locate in the field or may be only loosely defined. In a few cases, vertical zoning has been attempted, and horizontal boundaries have been established at certain depths if an MPA does not extend to either the sea surface (such as a PA for a seamount) or to the seabed. However, such boundaries are difficult if not impossible to mark and thus effective and practical compliance is also extremely difficult.
Connectivity between ecosystems and habitats	The scale over which marine connectivity occurs can be very large. Since the extent of connectivity may be critical to the health of an MPA, sufficiently large areas must be considered to ensure that ecosystem values are adequately protected.

Integrated Marine and Coastal Area Management Approaches for Implementing the Convention on Biological Diversity

Elements of the framework

A national framework that will deliver ICMAM should comprise the following three elements, representing, respectively, high, intermediate and low levels of resource protection for biodiversity:

- a representative network of highly protected areas where extractive uses are prevented, and other significant human pressures are removed (or at least minimised) to enable the integrity, structure, functioning and exchange processes of and between ecosystems to be maintained or recovered
- an ancillary network of areas that support the biodiversity objectives of the highly protected network, where specific perceived threats are managed in a sustainable manner for the purposes of biodiversity conservation and sustainable use
- sustainable management practices over the wider coastal and marine environment.

[Source: CBD 2004]

In India, seven threatened marine species have been selected for preparation of recovery plans, such as the Dugong, the Whale Shark, marine turtles (two species), giant clams, holothurians (sea cucumbers), the Horseshoe Crab and sea horses. The MoEFCC has already chosen the threatened Dugong, marine turtles, coral reefs and mangroves under its Integrated Development of Wildlife Habitats programme as a priority. Conservation actions have already been initiated.

Further resources:

<http://www.moef.nic.in/division/introduction-19>

http://www.wiienviis.nic.in/Database/SRP_8555.aspx



3.6 Relationship between the categories of MPAs and the permissible activities therein

Fishing and extraction of wild living resources are still very widespread in the marine environment and more so than on land (marine fisheries are the last wild commercial ‘harvest’ in the world), though hunting is obviously a significant issue for some terrestrial PAs. Many people thus still make their living from the exploitation of wild marine resources. As a result, the conflict between fishing and MPAs tends to be a much greater issue than that of extraction of living resources in terrestrial PAs.

Table 4: Matrix of marine activities that may be appropriate for each IUCN management category

Activities	Ia	Ib	II	III	IV	V	VI
Research: nonextractive	Y*	Y	Y	Y	Y	Y	Y
Nonextractive traditional use	Y*	Y	Y	Y	Y	Y	Y
Restoration/enhancement for conservation (e.g., invasive species 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
Nonextractive 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 of wildlife management (e.g., shark control programmes)	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

Activities	Ia	Ib	II	III	IV	V	VI
Restoration/enhancement for other reasons (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
Works (e.g., harbours, 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 exists, 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's objectives	*



3.7 Sustainable Fisheries Management

3.7.1 What is fisheries management?

Historically, fishing has been a major source of food for humanity and a provider of employment for coastal population. As fish has been considered as renewable natural resources, the tendency of harvesting these resources has been intensified in recent days. As a results, over-exploitation of important fish stocks, modifications of ecosystems, significant economic losses, and international conflicts on management and fisheries economic trade threatened the long-term sustainability of fisheries as well as of the MPAs.

The integrated process of data gathering, analysis, planning, consultation, decision-making, allocation of resources and formulation and implementation, with enforcement as necessary, of regulations or rules which govern fisheries activities in order to ensure the continued productivity of the resources and the accomplishment of other fisheries objectives - FAO, 1997.

3.7.2 Concept of Maximum Sustainable Yield (MSY)

In fisheries management, the maximum sustainable yield or **MSY** is, theoretically, the highest catch that can be taken from a fishery stock over an indefinite period (Europa, 2006). Under the assumption of logistic growth, the MSY will be exactly at half the carrying capacity of a species, as this is the stage at when population growth is highest. The maximum sustainable yield is usually higher than the optimum sustainable yield. Any small population at initial stage going through a slow growth at first and some point the growth will accelerate and that will start to level off once the species approaches carrying capacity. The idea of maximum sustained yield is to decrease population density to the point of highest growth rate possible.

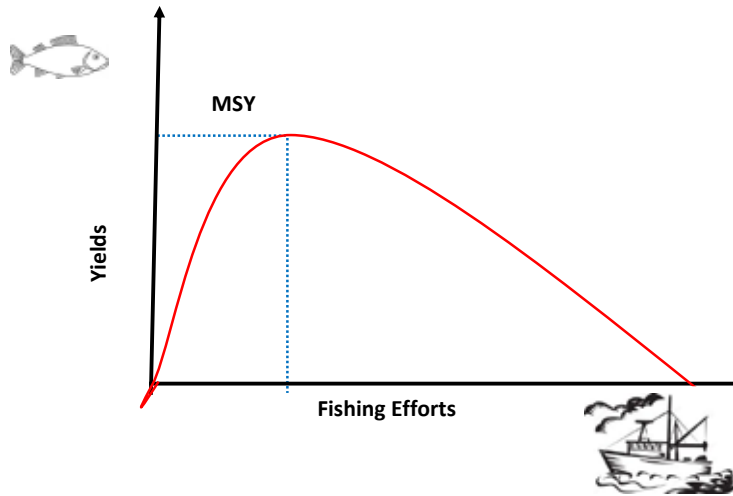



Figure : Illustrate the basic concept of Maximum Sustainable Yield

The horizontal axis is the fishing effort measure, for example number of fishing days. On the other axis is the yield i.e length and weight of target species. The graph shows that up to certain level we gain by increasing the fishing effort., but after that level the renewal of the resource (the reproduction and the body growth) cannot keep pace with the removal caused by fishing and a further increase in exploitation level leads to a reduction in yield (FAO 1991).

APPLICATION

Based on MSY, harvest rate can be assessed and predicted. We get to understand species recruitment rate, especially predict the addition of young ones. Based on the population growth, harvest rate can be decided at the point in their population growth rate where it is highest (the exponential phase). **Fixed fishing quotas** will produce a constant harvesting rate (i.e. a constant number of individuals fished in a given period of time).

A coastal scene with fishing boats and women on a beach. In the foreground, several large, round, woven baskets are filled with fish, resting on the sand. In the middle ground, two women are standing in the shallow water, handling a blue net. In the background, several fishing boats are visible on the water, and a bird is flying in the sky.

Watch the following videos at the channel of "Conservation Strategy Fund" for further information on sustainable fisheries management:

Fisheries Economics & Policy:
Intro to Fisheries Management
<https://www.youtube.com/watch?v=Z4AXnZOsrK8>

Fisheries Economics & Policy: Maximum
Economic Yield
<https://www.youtube.com/watch?v=7DNhqtYf47E>

3.7.3 Overfishing

Overfishing is a form of overexploitation where fish stocks are reduced to below acceptable levels.

Overfishing has significantly affected many fisheries around the world. As much as 85% of the world's fisheries may be currently over-exploited, depleted, fully exploited or in recovery from exploitation.

3.7.4 Artisanal fishing (small-scale) Vs Industrial fisheries (large-scale)

Artisanal fishing (often called small-scale fisheries), uses small inshore vessels and/or fixed gear (e.g., coastal traps, gill nets and cast nets) and its purpose is to catch fish and other organisms for their own consumption and sale (Pauly 2013).

Commercial fishing is the activity of catching fish and other seafood for commercial profit, mostly from wild fisheries. It provides a large quantity of food to many countries around the world, but those who practice it as an industry must often pursue fish far into the ocean under adverse conditions. Large-scale commercial fishing is also known as industrial fishing. Commercial fishermen harvest a wide variety of animals, ranging from tuna, cod, and salmon to shrimp, krill, lobster, clams, squid, and crab in various fisheries for those species.

Artisanal fishing	Commercial fishing
1. Uses small boats without any facility for fish processing	Large sized vessels with facility for fish processing
2. Uses fixed gears	Used large sized commercial trawl nets
3. Net with bigger mesh size for targeting adult individuals	Net with closed mesh size for targeting all species (small and large body size)
4. Minimum by-catch and trash fish landing	Huge landing of trash fish, which is wanted for animal husbandry industries
5. Operates in coastal area and shallow seas	Operates in EEZ and also deepwater
6. No negative impact on fish stock and ecosystem	Overexploitation of stock and degradation in habitat quality

3.7.5 Principles and Criteria for Sustainable Fisheries

(Source: MSC, 2010)

Principle 1: A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited stock and for those stocks that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Criteria

1. The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
2. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.
3. Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

Principle 2: Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

Criteria

1. The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.
2. The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimises mortality of, or injuries to endangered, threatened or protected species.

3. Where exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time frames, consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.

Principle 3: The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Criteria

A. Management System Criteria:

1. The fishery shall not be conducted under a controversial unilateral exemption to an international agreement.

The management system shall:

2. demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishing-dependent communities shall be addressed as part of this process;
3. be appropriate to the cultural context, scale and intensity of the fishery – reflecting specific objectives, incorporating operational criteria, containing procedures for implementation and a process for monitoring and evaluating performance and acting on findings;
4. observe the legal and customary rights and long term interests of people dependent on fishing for food and livelihood, in a manner consistent with ecological sustainability;
5. incorporates an appropriate mechanism for the resolution of disputes arising within the system³;

6. provide economic and social incentives that contribute to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing;
7. act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty;
8. incorporate a research plan – appropriate to the scale and intensity of the fishery – that addresses the information needs of management and provides for the dissemination of research results to all interested parties in a timely fashion;
9. require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted;
10. specify measures and strategies that demonstrably control the degree of exploitation of the resource, including, but not limited to:
 - a) setting catch levels that will maintain the target population and ecological community's high productivity relative to its potential productivity, and account for the non-target species (or size, age, sex) captured and landed in association with, or as a consequence of, fishing for target species;
 - b) identifying appropriate fishing methods that minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
 - c) providing for the recovery and rebuilding of depleted fish populations to specified levels within specified time frames;
 - d) mechanisms in place to limit or close fisheries when designated catch limits are reached;
 - e) establishing no-take zones where appropriate;
11. contains appropriate procedures for effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specifies corrective actions to be taken in the event that they are.

B. Operational Criteria

Fishing operation shall:

12. make use of fishing gear and practices designed to avoid the capture of nontarget species (and non-target size, age, and/or sex of the target species); minimise mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive;
13. implement appropriate fishing methods designed to minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
14. not use destructive fishing practices such as fishing with poisons or explosives;
15. minimise operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.;
16. be conducted in compliance with the fishery management system and all legal and administrative requirements; and
17. assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

Sustainable Seas: what is the MSC Fisheries Standard and how does it ensure healthy oceans

<https://www.youtube.com/watch?v=bw5tsy05uM8>



3.8 Participatory planning of MPAs

3.8.1 What is participatory planning?

While it is generally acknowledged that stakeholder participation is an essential component of effective management of natural resources, perceptions of what participation entails vary widely. In the context of MPA planning and management, participation can be defined as a process that facilitates dialogue among all stakeholders, mobilizes and validates popular knowledge and skills, supports communities and local institutions to manage and control resources, and seeks to achieve sustainability, economic equity, and social justice while maintaining cultural integrity.

Participation is relevant to all aspects of protected area management. The challenge is to define the form of participation that is the most appropriate for a given situation.

The arguments in favour of participation in planning and managing MPAs include the following:

- It contributes to improved management by incorporating popular knowledge and practices.
- It increases the likelihood of stakeholder compliance and support through participation in decision making.
- It incorporates a wide range of perspectives and ideas, resulting in improved management decisions and actions.
- It provides a forum for identifying conflicts between users and negotiating solutions to them.
- It can contribute to community empowerment and local institutional development, especially when the sharing of management responsibility is involved.

Planning processes can be described as participatory when they also include:

- the identification and involvement of all stakeholders, early in the process
- the incorporation of the diverse views and opinions of the individuals within these groups

- the sensitization of stakeholders to the issues being addressed
- provision of information needed to shape opinions and make decisions, in forms that are accessible to all participants
- the recognition of and accommodation for the inequities among stakeholder groups and among individuals, in order to assure that those who are more powerful do not dominate or manipulate processes
- respect for the process and the decisions that are reached—participatory planning cannot manipulate participation to arrive at a predetermined conclusion or even start from a predetermined point.

3.8.2 Key steps in participatory process

- *Identification of the groups, sectors, communities and individuals who have a stake in the resource or issue* which is the object of the planning initiative. This activity is generally not participatory, as its purpose is to identify those who should participate in the process.
- *Analysis of the expectations, rights and responsibilities of these various stakeholders.* This step is ideally conducted in a participatory manner, and can be an excellent mechanism for conflict management because it provides a forum for each party to hear and understand the perspectives of others, and to make its own perspectives heard and understood.
- *Analysis of needs, issues, causes and options.* This is the first main step in a classical planning process. In a participatory process, these analyses follow the identification and analysis of stakeholders and must therefore involve all these stakeholders. A wide range of tools is available and used to conduct such analyses, including participatory rural appraisal and rapid rural appraisal techniques, as well as scientific methods such as biological and socio-economic surveys, impact assessment studies and literature reviews.
- *The identification of options.* This is a critical step in a participatory process, as this is where all participants use the results of the various analyses to define priorities and to identify the various options available to them, with an appreciation of the costs and benefits associated with each.

Because the purpose of a participatory planning process is change (in perceptions, relations, practices and outcomes), it is not linear, but creates change at every step along the way. Inherent in the concept of participatory planning, therefore, is the idea that change is constant and that action can take place at any stage in the process. Participatory planning processes do not require the completion of a plan to witness changes on the ground. Their purpose is to change conditions and thus to provoke action. In the participatory approach to planning, implementation does not follow planning. It is a part of the planning process.

3.8.3 Constraints and obstacles

- A major constraint to participatory planning processes is the general lack of enabling policies and the prevalence of centralized systems of management.
- Participatory approaches require radical changes within the culture of organizations, notably those of the state. From a culture of enforcement and control, they need to move to the new attitudes, which can be achieved through capacity development, training, facilitation and support to the MPA managers.
- Involving all the agencies that have jurisdiction or responsibility over the area and its surroundings can be extremely difficult, but if any are not included, it may prove impossible to implement the decisions that are reached.
- Effective participation requires that all participants have a good grounding in the issues being addressed. The process of awareness building that is required to assure this can be time consuming and expensive.
- Facilitation is key to effective participation, and facilitators must be skilled and appear to be impartial, while assuring that stakeholder participation is fair and equitable. Many participatory planning processes are spoiled by poor or biased facilitation.
- Finally, participatory planning requires high investments of time as well as human and financial resources.

Case study: MPAs secure fish supply in the Philippines

The current nationwide productivity of fishing grounds in the Philippines is only ten per cent of what it used to be during the 1970s. This is mainly due to overfishing, but illegal practices such as cyanide fishing have also caused damage to fish stocks and coral reefs, which are important breeding grounds of fish species.

Some years ago, the coral reefs in the Visayas Region were in a pitiful condition. The local fisher folk and administration recognized that they had to act if they wanted to secure food supply and income. In 2005, local authorities designated MPAs. People learned to manage and to protect these zones, focusing not only on the ecological implications of destructive fishing methods but also on rights and law.

To better control the areas, volunteer patrols received equipment and watch towers were built in selected areas. Neighbouring communities joined the programme, which now covers 93 MPAs, with a total surface of more than 400 km². Many of the PAs show positive trends in fish stocks in terms of abundance, biomass and biodiversity.

Source: GIZ

Case study on Media reporting on coastal and marine biodiversity issues: Fishermen ride sustainability wave

By Richard Black

Environment correspondent, BBC News website

Colourful boats bob on the waves, children play their breathless games along the sandy tracks and fishermen and their families chat in the village's small pine-clad bar. But some here fear the future is less than bright for the sea and the catches it brings; they fear the sun is about to go down on an entire way of life. 'Since the 1990s, there has been a big depletion of species in this area,' says Juan Manuel Gomez Leis, over a glass of brown beer. 'In general, all of them have been depleted; here in Lira, octopus, squid, brown crab and turbot have virtually disappeared. We think overexploitation and overfishing is a large part of this, and we as fishermen have a responsibility.' The Lira fishermen, led by Mr. Gomez Leis, have embarked on a radical plan to safeguard their fishery—they are asking fishers to catch less. They want to establish a marine reserve along their stretch of coast, which lies between La Coruna and Vigo, two major ports in the province of Galicia. Within the reserve, fishing will be prohibited at certain places and in certain seasons of the year. They hope this will allow the stocks of brown crab, octopus and turbot to recover, so the grounds where they do fish will regain their former bountiful condition. They hope that catching less now will enable them, at some point in the future, to catch more.

Precautionary principle

The Lira marine reserve will by no means be the first in the world, of course, or even the first in Spain; though it is a Spanish first in the sense that the fishermen themselves are demanding the restrictions. And with global stocks in such stark decline that there may be no commercially viable marine fisheries within half a century, the logic behind them appears irrefutable. 'Marine reserves are a new, different and additional idea to marine management generally,' says Bill Ballantine, a New Zealand marine biologist who has spent three decades campaigning for the issue. 'Ordinary marine management doesn't do anything until there's some sort of problem.'

But marine reserves are precautionary, they say “we’re going to leave some bits alone so they can and will continue in their natural state, or that they will restore themselves, revert towards a more natural state.””

The price of fish

Across the globe you can find various types of reserves, ranging from places where all fishing is banned—the so-called no-take zones—to those where, like Lira, certain species can be caught at certain times of the year. The key, usually, is to protect the grounds where creatures spawn and reproduce, and the nurseries which shelter and feed the young. ‘Reserves give incredible results,’ asserts Ricardo Aguilar, Research Director of the campaign group Oceana. ‘In some areas they are multiplying the catch by a factor of 25, because destructive fishing gear is not there. In an area of Sicily, for example, they decided to ban trawling for mullet; and the catches by local fishermen using gillnets multiplied by 27, in only five years.’ Such tales are becoming more commonplace as coastal waters gain protection. Britain has one no-take reserve, established in 2003 around the Isle of Lundy off the north Devon coast, historically fertile ground for lobsters and other shellfish. ‘Initially we were somewhat sceptical of the marine nature reserve, as we weren’t quite sure what was being asked of us,’ recalls John Butterwith, head of the North Devon Fishermen’s Association. ‘The wardens and different people such as the divers who look after the area report a huge increase in the stocks of shellfish and also the sizes; so yes, an MPA is a very good thing.’ Evidence such as this was one of the factors persuading the community in Lira to push for their own PA. They were helped by a local academic, Antonio Garcia Allut, from the University of La Coruna, for whom making fisheries sustainable is a grail-like quest. He believes that establishing the reserve is just one link in the chain. Another is to make sure that fishermen are properly rewarded for their efforts. If they receive a higher price per fish, there is less pressure to catch more. Currently, he says, a big slice of the final market price is commanded by middlemen who may not care where the fish comes from or how it is caught. ‘I found that some products, for example shrimp, you could buy firsthand from the fishermen at 15 euros, and then finally the product would be sold in the market for 50 or 60 euros,’ he tells me. Hence the es-

establishment of Lonxanet, a cooperative venture which aims to change the paradigm and remove the financial reason to overfish.

Premium rates

The price of fish in the early morning markets where newly returned Galician skippers sell their catch is set by the market. Lonxanet buyers pay a premium over that market price. Fish are transported to the depot in La Coruna. A small sales team contacts potential buyers all over Spain, and products are despatched the same afternoon. 'In general, buyers want something that's certified as authentic Galician produce,' says Javier Vitancourt, Lonxanet's manager. 'On top of that, they want to buy a good fish caught by traditional means, and more and more restaurateurs favour the philosophy of protecting artisanal fishermen; and there are 'ecological' restaurants which look for our products.' By cutting out the traditional network of middlemen, Lonxanet says it will return about 90 per cent of the final price to the fisherman. On the face of it, it is a win-win situation. By certifying their wares, fishermen are able to enter the relatively new and lucrative marketplace of the discerning gourmand who demands fish produced to social and ecological standards. By making sustainability part of the certifying process, Lonxanet ensures that if fishermen want to continue reaping the rewards, they must harvest the shrimps, crab and hake with techniques that leave stocks healthy.

Open verdict

Combining the concepts of certification and marine reserves may be a model for the truly sustainable fishery. But there are limits. Clearly, not every consumer is willing to spend time selecting the supplier, or spend extra funds for the clean bill of ecological health that comes with these selected products. It is also doubtful whether the Lonxanet approach could work on large-scale open-water fisheries, though bodies such as the Marine Stewardship Council are doing their best to extend certification into these areas. The notion of marine reserves is probably more generally accepted than certification, but out on the water there is a long way to go. The CBD recommends that about 10 per cent of the oceans should be protected from fishing;

currently the total stands at about 0.5 per cent. There is some doubt, too, whether protecting 10 per cent would be enough. 'I've been recommending 10 per cent of everything for a quarter of a century now,' notes Bill Ballantine, 'and that is what we'd need for science and recreation and education. But if you wanted to be serious about conservation, keeping the options open for our grandchildren, you'd need at least 20 per cent of everything. If your primary concern was fishing, what you'd be recommending is 30 per cent.' After four years of preparatory work, the Lira fishermen hope to have their reserve established soon. They will regulate and police it themselves; and perhaps, in time, add to the evidence that in fisheries, less can be more. 'Many people who were against the project are now in favour, and we hope others will join us,' says Mr. Gomez Leis.

'We think that with the project of a marine reserve we can earn a living while allowing the next generation to continue fishing.'

Source: BBC NEWS <http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7067795.stm>



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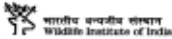
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About the CMPA project

The Project –‘Conservation and Sustainable Management of Existing and Potential Coastal and Marine Protected Areas (CMPA)’, under the Indo-German Biodiversity Programme, is a technical cooperation project jointly implemented by the Governments of India and Germany (2012-17). The Project is commissioned by the German Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety (BMUB) with funds provided under the International Climate Initiative (IKI), in partnership with the Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India.

The project aims at contributing to conservation of biodiversity through participatory approaches in the management of existing and potential coastal and marine protected areas in India. Project activities are implemented together with the Forest Departments of the project partner states - Gujarat, Goa, Maharashtra and Tamil Nadu, as well as with premier national training institutions.

Our partners



The Wildlife Institute of India (WII), Dehradun

WII has a mandate to train Indian Forest Service officers, State Forest Service officers and other key stakeholders such as the Coast Guard and Customs and has recently initiated a one-week refresher course exclusively addressing issues related to integrated management of coastal and marine biodiversity that is targeted at senior forest officials. <https://www.wii.gov.in/>



Xavier Institute of Communications (XIC), Mumbai

XIC is a professional media centre offering a variety of services in training and production. XIC is an autonomous educational unit of the Bombay St. Xavier's College Society Trust, which comprises St. Xavier's College, the Institute of Management, the Institute of Counseling and the Heras Institute of Indian History and Culture. XIC pilot-tested the curriculum between December 2014 and May 2015 and subsequently decided to integrate the curriculum into its Communication for Development (C4D) diploma course. www.xaviercomm.org



BMM Department, St. Xavier's College, Mumbai

St. Xavier's College is one of the most prestigious liberal arts colleges in India. The BMM department was established in 2002. The Bachelor in Media Studies, a programme begun by the University of Mumbai in 1999, is being run by St. Xavier's College under the system of academic autonomy. While this is an applied course that seeks to provide industry with qualified media professionals, St. Xavier's believes that an academic grounding is very essential for forming young people for this crucial job of communications. www.xaviers.edu



St. Paul's Institute of Communication Education (SPICE), Mumbai

St. Paul's Institute of Communication Education (SPICE) is a fast-growing media school in India offering a comprehensive post-graduate diploma in journalism that trains students for a career in print journalism, television journalism and digital journalism. With top-notch media faculty members and excellent infrastructure, SPICE is the go-to destination for Gen Next journalists. www.stpaulsice.com



Department of Communication, Journalism and Public Relations, Gujarat University

The Department of Communication, Journalism and Public Relations was established in 1987–1988. The department plays a vital role in providing media professionals and communication experts to various fields. Two courses are offered by the department, the Master's in Mass Communication and Journalism (MMCJ) and the Master's in Development Communication (MDC). <http://www.gujaratuniversity.org.in>

