Managing Coastal Marine Biodiversity and Protected Areas

For MPA managers

Module 9

Tools for mainstreaming: Impact assessment and spatial planning

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Disclaimer:

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Summary

To ensure that biodiversity-related issues and concerns become a part of the larger development planning process in the country, there is a need to incorporate it into policies, strategies and action plan. There is also a need to use science-based tools to understand the impact that projects can have on the environment and ensure that spatial planning incorporates measures for conservation of coastal and marine biodiversity.

Key Messages

- Biodiversity policy should not be seen as independent of sectoral policies, but rather sectoral policies should be seen as an instrument to implement national biodiversity goals. “Mainstreaming” means integrating or including actions related to conservation and sustainable use of biodiversity in sectoral strategies.
- To ensure that development is planned and implemented with biodiversity in mind, impact assessment is being used as an important tool.
- Severity of impacts of infrastructure development in the coastal zone varies widely depending on many factors such as the extent, period and type of disturbance, manmade perturbations, capacity of the receiving water to assimilate requirements for assessing such impacts as general baseline information.
- The inclusion of biodiversity in EIA is a two-way process. It not only draws on information on biodiversity but also generates useful biodiversity data. There is no debate on the immediate need for biodiversity conservation, although debate regarding the best methodology to address biodiversity continues.
- Where Strategic Environmental Assessment (SEA) is applied to plans and programmes, a structured approach to integrating environmental considerations can be used.
- In the next 20 years, our oceans could be very different. We could have achieved a vision of clean, safe, healthy, productive and biologically diverse oceans. Ecosystem-based, marine spatial planning of human activities could result in society gaining more benefits from the use of the marine environment than previously, while its natural diversity is better protected.

9.1 Mainstreaming biodiversity:

According to the CBD, "Mainstreaming" means integrating or including actions related to conservation and sustainable use of biodiversity in sectoral strategies relating to production sectors (such as agriculture, fisheries, forestry and mining), in national plans and programmes (such as poverty reduction plans and national sustainable development plans).

At the core of the concept of 'mainstreaming' lies the fact that like any relationship, the interlinkagebetween biodiversity and other sectors and processes is also a two-way process, where biodiversity affects the activities of the other sectors and/or is affected by the activities of a particular sector. Whether the relationship will be positive or negative, depends on the degree to which the activities are carried out, keeping biodiversity in mind.

> Ideally, biodiversity policy should not be seen as independent of sectoral policies, but rather sectoral policies should be seen as an instrument to implement national biodiversity goals.

So, if biodiversity concerns are integrated in the overall development planning, sectoral strategies and legal frameworks, there will be a two-fold impact:

1. Negative impacts of the activities/ strategies/policies of the other sectors can be minimized, leading to conservation of biodiversity, for example urban development and agriculture.
2. Conservation of biodiversity may significantly increase sustainability of certain sectors, viz, poverty alleviation, climate change adaptation.

The enabling conditions for mainstreaming biodiversity include

- An institutional and legal framework
- A planning system
- Knowledge and information
- Political commitment (provided it refl ects what society really wants)
- Participation
- Technical capacity

- Awareness
- Mainstreaming in sectors
- Ensuring livelihoods (tenure, certainty, long-term perspective)
- Communication and cooperation (in particular scientists-managers)
- National Biodiversity Strategy and Action Plans (NBSAPs)
- A monitoring system
- Regional cooperation
- Economic and social incentives

9.2 Impact assessment as a legal instrument for mainstreaming biodiversity

One legal instrument specifically of relevance to mainstreaming biodiversity is impact assessment. In the following section, we discuss two forms of impact assessment: EIA, which is already a mandatory requirement in India supported by law, and SEA, which is still in its infancy and purely voluntary. These two differ in scales and objectives.

To ensure that development is planned and implemented with biodiversity in mind, impact assessment is being used as an important tool. The major conventions on biodiversity—CBD, the Ramsar Convention and the Convention on Migratory Species—recognize impact assessment as an important decision-supporting tool to help plan and implement development with biodiversity 'in mind.'

The CBD requires parties to apply impact assessment to projects (EIA) as well as to programmes, plans and policies (SEA), which have potential negative impact on biodiversity. The impact assessment should ideally address biodiversity conservation, sustainable use and equal benefit-sharing issues at the three levels, viz, habitat, species and genetic diversity. Some of the areas where integration of biodiversity may yield significant positive results are urban development, combating climate change, forestry, fisheries, trade, biotechnology, tourism, energy and climate change, and poverty reduction

9.3 Environmental impact assessment (EIA)

EIA is a planning tool used to predict and evaluate the potentially significant impacts of proposed action and provide a mitigation plan for minimizing adverse impacts for making decisions on the proposed project/program/policy. It is a procedure to know the positive and negative aspects of a proposed activity including the natural, social and economic aspects. It is a decision-making process to take a decision whether a developmental project must start or not. The International Association for Impact Assessment (IAIA) defines EIA as '*the process for identifying, predicting, evaluating and mitigating the biophysical, social and other relevant effects of development proposals prior to major decisions being taken and commitments made.*' In environmental cases the purpose of the assessment is to ensure that decision makers consider the ensuring environmental impacts when deciding whether a project should be allowed to proceed or not. The EIA includes likely adverse effects on human beings, vegetation cover, animal kingdom, air, water, land and property.

The EIA is a tool that seeks to ensure sustainable development through the evaluation of those impacts arising from a major activity (policy, project or programme and plan) that are likely to have environmental effects. The purpose of EIA is to ensure the protection and conservation of the environment and natural resources including human health aspects against uncontrollable development. It is anticipatory, participatory and systematic in nature and relies on multidisciplinary input.

9.3.1 The legal basis for EIA

EIA is an important management tool for ensuring optimal use of natural resources for sustainable development. A beginning in this direction was made in our country with the impact assessment of river valley projects in 1978–79, and the scope has subsequently been enhanced to cover other developmental sectors such as industries, thermal power projects and mining schemes. To facilitate collection of environmental data and preparation of management plans, guidelines have been evolved and circulated to the concerned central and state government departments. EIA has now been made mandatory under the Environmental Protection Act, 1986, for 29 categories of developmental activities involving investments of INR 50 crores and above.

The Environmental Clearance Regulation of 2006 is in supersession of the notification of 1994 relating to EIA. It has been issued in the exercise of the powers conferred by Section 3(I) and (2) (V) of the Environmental Protection Act, 1986, read with Rule 5(3)(d) of the Environment Protection Rules, 1986.

The regulation provides that construction of new projects and activities or expansion or modernization of existing projects at the time of this notification will not be undertaken on and from the date of its publication (14 September 2006) without the prior environmental clearance from the central government or by the State Level Environmental Impact Assessment Authority (SLEIAA) duly constituted under this regulation. Thirty different categories of projects require clearance from the central government.

Some of them are offshore and onshore oil and gas exploration, mining, airport, river valley, soda ash industry, pesticide industry and complex, chemical fertilizer, integrated paint industry and many others.

One of the reasons to adopt the EIA model in India is the Bhopal gas catastrophe, known to be the world's worst industrial disaster. In the course of time, the public also became aware of the requirements, and the central government with a notification in 1994 introduced EIA for the projects cited therein. The Environmental Clearance Regulation of 2006 is in supersession of the notification of 1994 relating to EIA. It has been issued in the exercise of the powers conferred by sections 3(I) and (2)(V) of the Environment Protection Act, 1986.

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9.3.2 EIA of coastal projects: What are the indicators to look out for?

Coastal states are required to prepare Coastal Zone Management Plans as per the provisions of the Coastal Regulation Zone (CRZ) Notification 1991, identifying and categorizing the coastal areas for different activities and submit them to the ministry for approval.

For the purpose of protecting and conserving the coastal environment, the ministry declares coastal stretches of seas, bays, estuaries, creeks, rivers and backwaters which are influenced by tidal action (on the landward side), up to 500 metres from the high tide line and the intertidal zone as the CRZ.

This notification was issued under Section 3(I) and Section 3(2)(V) of the Environment Protection Act, 1986, and Rule 5(3)(d) of the Environmental Protection Rules, 1986. The notification imposes restrictions on the

- Setting up and expansion of industries
- Operations or processes in the CRZ

Based on the environmental results and the probable perturbations due to the proposed project, the impact of various activities on marine ecology will be assessed during construction as well as operational phases of the project. Suitable mitigation measures in terms of the marine environmental management plan will be suggested to minimize the adverse impact identified.

Severity of impacts of infrastructure development in the coastal zone varies widely depending on many factors such as the extent, period and type of disturbance, manmade perturbations, capacity of the receiving water to assimilate requirements for assessing such impacts as general baseline information.

Tides will be assessed with available data in the area. The currents will be measured at the proposed release location for around one week. Water quality would be assessed at several locations to evolve a general background for the coastal sea off the project site. Intertidal and subtidal sediments off the project site would be studied for texture, selected metals (chromium, iron, cobalt, nickel, copper, zinc, lead, cadmium and mercury), organic carbon, phosphorous and pH. The status of flora and fauna of the project area would be established based on phytoplankton pigments, population and genetic diversity, zooplankton biomass, population and growth diversity, fisheries, mangroves and intertidal corals.

9.3.3 Biodiversity in EIA: Challenges and way forward

The inclusion of biodiversity in EIA is a two-way process. It not only draws on information on biodiversity but also generates useful biodiversity data. There is no debate on the immediate need for biodiversity conservation, although debate regarding the best methodology to address biodiversity continues.

The focus of discussion is on the best ways to address this problem. The main difficulties in inclusion of biodiversity in EIA include:

- absence or inadequate representation of the effect on ecosystem functions due to lack of biodiversity data;
- ill-defined baseline ecosystem conditions;
- lack of consideration of cumulative effects of projects;
- inadequate mitigation and post-monitoring;
- lack of quality control; and
- poor stakeholder participation.

There is a need to enhance the focus on developing impact prediction tools for biodiversity, which will not only standardize the impact prediction process for biodiversity but will also help the decision makers in making accurate decisions on the impacts of projects on biodiversity.

Second, a standardized approach for biodiversity monitoring based on scientific criteria and carefully selected indicators is also needed.

Third, the task of transferring the knowledge and information related to good practices in biodiversity impact prediction and monitoring methods needs to be undertaken by the established scientific organizations.

Fourth, adapting a long-term and more sustainable approach to impact assessment, which provides information on the potential risks at an early stage itself, and increasing the time and cost efficacy of mitigation measures. One such tool is SEA.

Case Study: Inclusion of biodiversity into EIA in India:

To assess the status of biodiversity inclusion in EIA studies in India, 22 EIA reports were evaluated from different sectors (transport, power, urban management, etc.) using a set of seven criteria and 30 questions defining attributes, as follows:

Table 1. Criteria and attributes used for evaluating a sample of EIA reports in India

Criteria		Attribute/Question
Enough information on the impact area vis-à-vis biodiversity has been gathered	1	Is the location map showing known biodiversity area, urban area, other industrial establishments and projects and distance from coastal area/surface water bodies/ ecologically sensitive areas, etc. available?
	2	Has the impact area been described keeping in mind the biodiversity impacts, wherever biodiversity impacts are likely to occur over a larger area?
Baseline study is comprehensive enough to provide a basis for correct impact prediction	3	Have the components of the biodiversity likely to be affected by the project been identified and described sufficiently for the prediction of impacts?
	4	Does the information include listings of endemic and endangered species present within the proposed project area?
	5	Where applicable, does the baseline data identify and enumerate flora and fauna including seasonal variables, e.g. species, migration routes, spawning and breeding grounds?
	6	Has the importance of biodiversity elements present in the impact area been assessed and described?
	7	Were biodiversity experts involved in conducting the study?
	8	Does the method of collection of primary biodiversity data conform to the guidelines of MoEF?
	9	Have sources of secondary data been referred to?
	10	Are gaps and limitations of the baseline biodiversity data indicated and means to deal with them explained?

Criteria		Attribute/Question
All the possible impacts on all components of biodiversity are predicted	11	In order to effectively address biodiversity impacts, it is imperative that biodiversity impacts are not merged within the broader category of ecological impacts, or merely as impact on flora and fauna. Therefore, it was a matter of concern if the biodiversity impacts were described in a separate section.
	12	Are direct biodiversity impacts described appropriately?
	13	Are indirect, secondary and cumulative biodiversity impacts described appropriately?
	14	Are short-term/long-term impacts on biodiversity due to air, noise or water pollution described?
	15	Has the significance of the impacts been assessed?
	16	Does the impact on biodiversity cover all the three levels, viz. ecosystem, species and genetic level?
	17	Are the biodiversity impacts predicted in quantitative terms?
	18	Are the biodiversity impacts predicted in qualitative terms?
	19	Are the methods/approaches used to identify the impacts and the rationale for using them described?
An effort is made to effectively involve stakeholders in decision making	20	Were vulnerable stakeholders of the project identified?
	21	Were effective measures taken to inform stakeholders for participation in the discussion?
	22	Were current and potential ecological services provided by the affected ecosystem discussed appropriately with the stakeholders to determine the values these services represent for society?
	23	Were concerns of public regarding biodiversity impacts adequately addressed in the mitigation plan?
Alternatives with least biodiversity damage are available	24	Have biodiversity impacts of the alternative solutions/sites been described and compared with the proposed development and with the likely future conditions in zero-option development?
Effective mitigation measures for the predicted impacts are proposed	25	Is mitigation a part of the project design from the start of the development of the project?
	26	Are mitigation measures proposed to address the biodiversity impacts at all levels, i.e. genetic/species/landscape and all structures trees/shrubs/herbs as well as temporal biodiversity?
	27	Is effectiveness of the mitigation measures addressed and gaps identified?

Criteria		Attribute/Question
An effective biodiversity monitoring plan is in place	28	Is a monitoring plan for biodiversity impact proposed?
	29	Are details of the criteria and indicators to be used during the monitoring available in the report?
	30	Have the limitations in monitoring biodiversity been identified and addresse

Each attribute was scored on a scale of 0 to 1, where 0 = the attribute was not met in the report, 0.5 = the attribute was only partially met in the report and 1 = the attribute was fully met in the report. Both authors evaluated each report to ensure consistency in the evaluation and as a quality-control measure. The point scores were used to generate a Biodiversity Inclusion Index (BII) using the following formula, which is modified from Atkinson et al (2000) and Soderman (2005):

$$BII = A+0.5B/3030$$

where A = number of attributes fully met, B = number of attributes partially met and 30 = total number of attributes.

Using the above formula, the BIImax has a value of 1, that is a case where all the attributes are met completely. The BII allowed for easy comparison of the status of biodiversity inclusion between the EIA reports studied. However, while using an index is useful for overall comparison, comparing overall scores can hide differences in the relative strengths/weaknesses of the different EIAs.

Results indicated that in most cases biodiversity-related information was either missing or described in a superficial way.

Major limitations in the current practices are poor description of indirect, secondary and cumulative biodiversity impacts, and lack of representation of all the three levels (habitat, species and genetic) and forms (compositional, structural and functional) of biodiversity in impact prediction as well as in mitigation measures and monitoring plans. None of the reports received a Biodiversity Inclusion Index score of >0.75, while approximately 63% of reports scored 0.50–0.75 and 37% <0.50.

[Source: Khera and Kumar, 2010]

9.4 Strategic Environmental Assessment (SEA)

9.4.1 What is SEA?

SEA refers to a range of 'analytical and participatory approaches that aim to integrate environmental considerations into policies, plans and programmes and evaluate the inter-linkages with economic and social considerations.' SEA can be described as a family of approaches which use a variety of tools, rather than a single, fixed and prescriptive approach. A good SEA is adapted and tailor-made to the context in which it is applied. This can be thought as a continuum of increasing integration: at one end of the continuum, the principal aim is to integrate environment, alongside economic and social concerns, into strategic decision-making; at the other end, the emphasis is on the full integration of the environmental, social and economic factors into a holistic sustainability assessment.

SEA is applied at the very earliest stages of decision-making both to help formulate policies, plans and programmes and to assess their potential development effectiveness and sustainability. This distinguishes SEA from more traditional environmental assessment tools, such as the EIA, which have a proven track record in addressing the environmental threats and opportunities of specific projects but are less easily applied to policies, plans and programmes. SEA is not a substitute for, but complements, EIA and other assessment approaches and tools.

9.4.2 SEA and EIA compared:

Table: SEA and EIA compared

EIA	SEA
Applied to specific and relatively short-term (life-cycle) projects and their specifications.	Applied to policies, plans and programmes with a broad and long-term strategic perspective.
Takes place at early stage of project planning once parameters are set. Considers limited range of project alternatives.	Ideally, takes place at an early stage in strategic planning. Considers a broad range of alternative scenarios.
Usually prepared and/or funded by the project proponents.	Conducted independently of any specific project proponent.
Focus on obtaining project permission, and rarely with feedback to policy, plan or programme consideration.	Focus on decision on policy, plan and programme implications for future lower-level decisions.
Well-defined, linear process with clear beginning and end (e.g. from feasibility to project approval).	Multi-stage, iterative process with feedback loops.
Preparation of an EIA document with prescribed format and contents is usually mandatory. This document provides a baseline reference for monitoring.	May not be formally documented.
Emphasis on mitigating environmental and social impacts of a specific project, but with identification of some project opportunities, off-sets, etc.	Emphasis on meeting balanced environmental, social and economic objectives in policies, plans and programmes. Includes identifying macro-level development outcomes.
Limited review of cumulative impacts, often limited to phases of a specific project. Does not cover regional-scale developments or multiple projects.	Inherently incorporates consideration of cumulative impacts.

9.4.3 Why SEA?

Applying SEA to development cooperation has benefits for both decision-making procedures and development outcomes. It provides the environmental evidence to support more informed decision making, and to identify new opportunities by encouraging a systematic and thorough examination of development options. SEA helps to ensure that the prudent management of natural resources and the environment provides the foundations for sustainable economic growth which, in turn, supports political stability. SEA can also assist in building stakeholder engagement for improved governance, facilitate transboundary cooperation around shared environmental resources, and contribute to conflict prevention.

SEA is a continuous, iterative and adaptive process focussed on strengthening institutions and governance. It is not a separate system, nor a simple linear, technical approach. Instead, it adds value to existing country systems and reinforces their effectiveness by assessing and building capacity for institutions and environmental management systems.

Where SEA is applied to plans and programmes, a structured approach to integrating environmental considerations can be used. Key stages for carrying out an SEA on the level of plans or programmes include establishing the context, undertaking the needed analysis with appropriate stakeholders, informing and infl uencing decision-making, and monitoring and evaluation. SEA applied at the policy level requires a particular focus on the political, institutional and governance context underlying decision-making processes.

9.4.4 How is SEA conducted?

Some examples of tools that could be used in SEA

Tools for ensuring full stakeholder engagement:

- Stakeholder analysis to identify those affected and involved in the PPP decision
- Consultation surveys
- Consensus building processes

- Tools for predicting environmental and socioeconomic effects:
- Modelling or forecasting of direct environmental effects
- Matrices and network analysis
- Participatory or consultative techniques
- GISs as a tool to analyse, organize and present information
- Tools for analysing and comparing options:
- Scenario analysis and multicriteria analysis
- Risk analysis or assessment
- Cost–benefit analysis
- Opinion surveys to identify priorities

9.4.5 Basic Steps of SEA

1. Establishing the context for SEA
    a. Screening
    b. Setting objectives
    c. Identifying stakeholders
2. Implementing the SEA
    a. Scoping
    b. Collecting baseline data
    c. Identifying alternatives
    d. Identifying how to enhance opportunities and mitigate negative impacts
    e. Reporting
3. Informing decision-making
    a. Making recommendations
    b. Communication
4. Monitoring and evaluation

CASE STUDY

Integration of Biodiversity Aspects in Strategic Environmental Assessment of Nepal Water Plan and Environmental Impact Assessment of Operational Forest Management Plans in Nepal

This case study focuses on inclusion of biodiversity aspects in the Strategic Environmental Assessment (SEA) report of the Nepal Water Plan (NWP) finalised in July 2003, and separate plan-level Environmental Impact Assessment (EIA) reports of the Operational Forest Management Plan (OFMP) of Bara, Rautahat, and Dhanusha districts prepared in 1995, 1996 and 2000 respectively. The EIA report of OFMPs is taken into consideration as they are of plan level impact assessment. Nepal has prepared OFMPs of 20 Terai districts, and has included EIA as a separate chapter with a view to inform the decision-makers and the implementers to integrate environmental aspects including biodiversity conservation during their implementation (of OFMPs). The EIA report of OFMPs has more or less similar contents, issues, impacts, mitigation measures and monitoring requirements. The NWP is of national character, and OFMPs are location specific, i.e., within the administrative jurisdiction of the District Forest Office. The districts are the administrative units of His Majesty's Government of Nepal (HMGN). Each District Forest Office administers forest conservation and management activities including biodiversity aspects in forests, protected areas and wetlands. At present, about 39.6% of Nepal's total area (of 147,181 km2) is under forest cover and the forestry organisations administer it. The plan level EIA has been conducted only for the forestry sector. The SEA of NWP is the first of its kind in the water resources sector. http://www.eia.nl/nceia/pdfs/sea/casestudies/15_nepal_water_plan.pdf

[Source: CBD]

9.5 Marine Spatial Planning (MSP)

9.5.1 What is marine spatial planning?

Marine spatial planning (MSP) is a practical way to create and establish a more rational organization of the use of marine space and the interactions between its uses, to balance demands for development with the need to protect marine ecosystems, and to achieve social and economic objectives in an open and planned way.

Marine spatial planning (MSP) is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process. It is important to remember that we can only plan and manage human activities in marine areas, not marine ecosystems or components of ecosystems.

We can allocate human activities to specific marine areas by objective, e.g., development or preservation areas, or by specific uses, e.g., wind farms, offshore aquaculture, or sand and gravel mining.

Characteristics of effective marine spatial planning

- Ecosystem-based, balancing ecological, economic, and social goals and objectives toward sustainable development
- Integrated, across sectors and agencies, and among levels of government
- Place-based or area-based
- Adaptive, capable of learning from experience
- Strategic and anticipatory, focused on the long-term
- Participatory, stakeholders actively involved in the process

Source: UNESCO, 2009

9.5.2 Why do we need marine spatial planning?

Most countries already designate or zone marine space for a number of human activities such as maritime transportation, oil and gas development, offshore renewable energy, offshore aquaculture and waste disposal. However, the problem is that usually this is done on a sector-by-sector, case-by-case basis without much consideration of effects either on other human activities or the marine environment.

Consequently, this situation has led to two major types of conflict:

- Conflicts among human uses (user-user conflicts);
- Conflicts between human uses and the marine environment (user-environment conflicts).

These conflicts weaken the ability of the ocean to provide the necessary ecosystem services upon which humans and all other life on Earth depend. Furthermore, decision-makers in this situation usually end up only being able to react to events, often when it is already too late, rather than having the choice to plan and shape actions that could lead to a more desirable future of the marine environment.

By contrast, marine spatial planning is a future-oriented process. I t can offer you a way to address both these types of conflict and select appropriate management strategies to maintain and safeguard necessary ecosystem services.

Source: UNESCO, 2009

9.5.3 What if we do nothing?

In the next 20 years, human activities in many areas of the ocean will have increased significantly. Traditional uses, such as marine transportation, sand and gravel mining, and marine recreation will continue to grow in importance. Oil and gas development will continue to push further and deeper offshore with many of its operations occurring only underwater. Fisheries, will continue to exist, but at lower levels, due to the diminished stocks, and in more restricted areas because of competition for ocean space. New uses of the ocean, e.g., offshore renewable energy and offshore aquaculture, will

compete with traditional uses for space. Climate change will have modified species distributions and habitats; increasing ocean acidification will raise new concerns about the survival of some species. In many areas, increasing public concern about the health of the ocean will lead to significant areas set aside for nature conservation. Conflicts among human activities will increase, e.g., collisions of ships with wind turbines might occur, as might conflicts between wave parks and surfers and sailors.

Source: UNESCO, 2009

9.5.4 What might marine spatial planning produce?

In the next 20 years, our oceans could be very different. We could have achieved a vision of clean, safe, healthy, productive and biologically diverse oceans. Ecosystem-based, marine spatial planning of human activities could result in society gaining more benefits from the use of the marine environment than previously, while its natural diversity is better protected. Climate change will drive change both in the environment itself and the way in which people use it. Offshore renewable energy development will be commonplace and carbon capture and storage in the ocean could be underway. The cumulative environmental effects of using the marine environment will be managed through integrated MSP and account will be taken of the changing acidity and temperature that will already be affecting our oceans and seas. We will be responding to this through MSP so that the integrity of marine ecosystems is conserved.

9.5.5 What are the benefits of marine spatial planning?

When developed properly, marine spatial planning can have significant economic, social, and environmental benefits.

- Identification of biological and ecological important areas
- Biodiversity objectives incorporated into planned decision-making
- Identification and reduction of conflicts between human use and nature
- Allocation of space for biodiversity and nature conservation
- Establish context for planning a network of marine protected areas
- Identification and reduction of the cumulative effects of human activities on marine ecosystems

- Greater certainty of access to desirable areas for new private sector investments, frequently amortized over 20-30 years
- Identification of compatible uses within the same area of development
- Reduction of conflicts between incompatible uses
- Improved capacity to plan for new and changing human activities, including emerging technologies and their associated effects
- Better safety during operation of human activities
- Promotion of the efficient use of resources and space
- Streamlining and transparency in permit and licensing procedures
- Improved opportunities for community and citizen participation
- Identification of impacts of decisions on the allocation of ocean space (e.g., closure areas for certain uses, protected areas) for communities and economies onshore (e.g., employment, distribution of income)"
- Identification and improved protection of cultural heritage
- Identification and preservation of social and spiritual values related to ocean use (e.g., the ocean as an open space)

Source: UNESCO, 2009

9.5.6 Stakeholder Participation

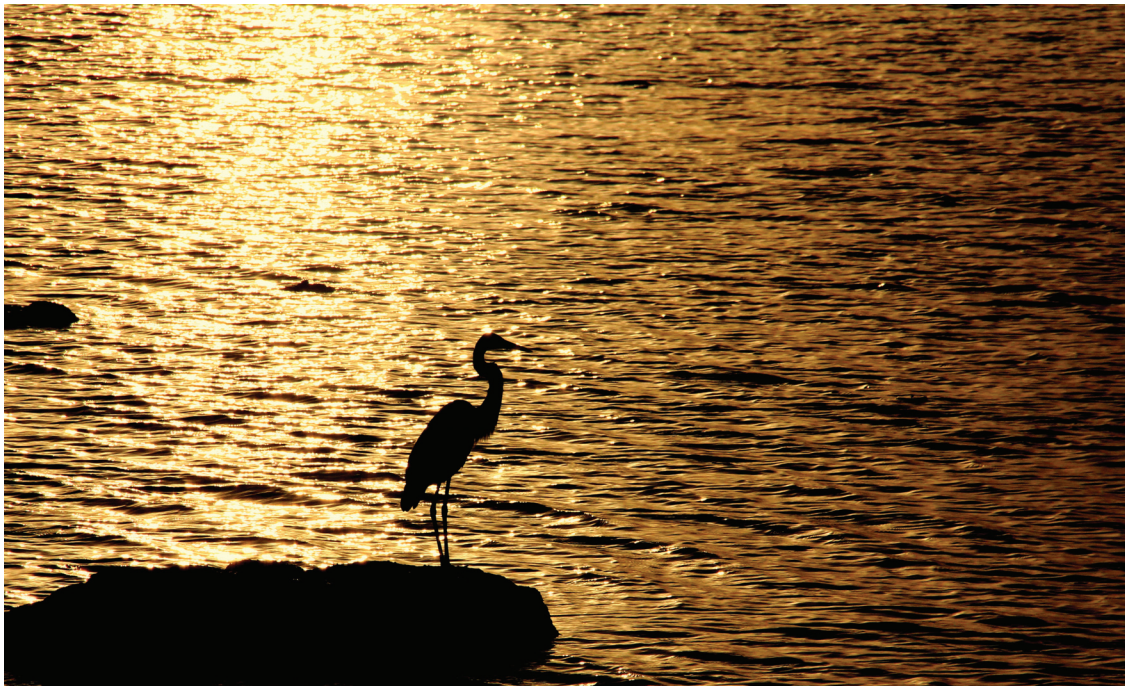
Involving key stakeholders in the development of marine spatial planning (MSP) is essential for a number of reasons. Of these, the most important is because MSP aims to achieve multiple objectives (social, economic and ecological) and should therefore reflect as many expectations, opportunities or conflicts occurring in the MSP area.

The scope and extent of stakeholder involvement differs greatly from country to country and is often culturally influenced. The level of stakeholder involvement will largely depend on the political or legal requirements for participation that already exist in your country.

Generally speaking, all individuals, groups or organizations that are in one way or another affected, involved or interested in MSP can be considered stakeholders. However, involving too many stakeholders at the wrong moment or in the wrong form can be very time consuming and can distract you from the expected or anticipated result.

To involve stakeholders effectively (e.g., leading toward expected results) and efficiently (e.g., producing expected results at least-cost), you need to consider three important questions

1. Who should be involved?
2. When should stakeholders be involved?
3. How should stakeholders be involved?



9.6 Sectoral standards, codes of conduct, guidelines, certification-schemes and good practices

Standards are policy guidelines that regulate the effect of human activity upon the environment. Standards may specify a desired state (e.g. lake pH should be between 6.5 and 7.5) or limit alterations (e.g. no more than 50% of mangrove forest may be damaged).

Guidelines provide voluntary and practical advice and streamlining on how to undertake particular processes. Guidelines, for example the CBD Tourism guidelines, are usually relatively general and can be applied to a number of circumstances.

Codes of Conduct can be very detailed, and set out standards of behaviour for responsible practices with a view to ensuring sustainable resource use. A good example of a sector specific code of conduct is the FAO Code of Conduct for Responsible Fisheries.

Good practices (or best practices) are informal examples of actions that can be undertaken to achieve certain sustainability goals, or points that need to be kept in mind towards this end. The best practices for conserving traditional knowledge related to sustainable fisheries, or good practices for community-based coastal tourism are some of the examples.

9.6.1 Marine products certification:

The Marine Stewardship Council (MSC) is an international non-profit organisation established to address the problem of unsustainable fishing and safeguard seafood supplies for the future. Our vision is for the world's oceans to be teeming with life – today, tomorrow and for generations to come. Through our certification and ecolabelling program, we're helping to create a more sustainable seafood market.

We run the only certification and ecolabelling program for wild-capture fisheries that meets best practice guidelines set by both the United Nations Food & Agriculture Organization and ISEAL, the global membership association for sustainability standards. By being part of this program fisheries,

retailers and food processors from around the globe are helping to safeguard seafood supplies (MSC Global Impacts Summary Report, 2015).

MARINE STEWARDSHIP COUNCIL (MSC)

Our fisheries, our future. Sustainable fishing in the developing world
https://www.youtube.com/watch?v=Vq5I3pNCUzY

9.6.2 Clean Beach Certification:

The Clean Beaches Coalition (CBC) is a network of coastal organizations and individuals committed to promoting clean, healthy and well managed beaches around the world. CBC has pioneered the concept of Blue Wave Ethics and Blue Wave Certification.

Blue Wave beaches and destinations represent the complete eco-coastal experience. As such, we support clean, safe and economically thriving beach communities and have developed the 7 blue wave ethics ensure sustainable beaches. The Blue Wave program is the first national environmental certification for beaches. The Blue Wave certification process is designed to help maintain robust, healthy, and vibrant beaches-

9.7 Incorporating biodiversity into policies, plans and programmes

9.7.1 Urban development

Another sector is urban development, which is becoming more and more important for mainstreaming biodiversity, not only because of the increase in the proportion of the world's population and more concentrated human assemblages in the urban areas, but also because these urban areas are expanding into the natural ecosystems in the peri-urban areas. Ecosystems in urban areas are, most often, in a highly fragmented and stressed form and are therefore not able to meet the tremendously increasing demand for the ecosystem services required by city dwellers—in the form of clean air and water, spiritual and stress-releasing activities, and most importantly, disaster risk reduction.

According to CBD's Cities and Biodiversity Outlook, by 2050 almost three billion additional people will inhabit the world's cities and the world will have undergone the largest and fastest period of urban expansion in history.

While discussing cities, it is important to bear in mind that 13 out of the 20 most populated cities in the world in 2005 are port cities. Port cities are highly vulnerable to natural disasters like cyclones and urban flooding, which are becoming more frequent due to climate change. A study published by OECD focussing on the threats from coastal flooding in 136 port cities around the world concludes that by the 2070s, the total population exposed could grow more than three-fold to around 150 million people due to the combined effects of climate change (sea level rise and increased storminess), subsidence, population growth and urbanization. About 38 per cent of the port cities studied in this paper are found in Asia.

Realizing the need to conserve biodiversity in the cities and also to involve local governments and other stakeholders in this process, several initiatives have been taken under the umbrella of CBD.

9.7.2 Fisheries and aquaculture

Fisheries and aquaculture have had damaging impacts on both commercially harvested fi sh stocks, and nontarget species and habitats. Here are some examples of how fi sheries as an activity can have a negative implication on biodiversity:

- The use of trawl nets has been reported to cause major disturbances to ocean fl oor and benthic fauna
- Negative impacts on nontarget species
  - Use of gillnets for fishing may lead to accidental capture of juvenile individuals of large fish species

A good example of integrating biodiversity concern into fisheries sector:

Central Institute of Fisheries Technology's (CIFT's) semipelagic trawl system (SPTS)

SPTS was developed by scientists of the Fishing Technology Division of CIFT as an alternative to bottom trawling, which causes high impacts on the sea bottom and also is nonselective. This gear system has been developed and optimized taking into consideration the biological, behavioural and distribution characteristics of tropical demersal and semipelagic finfish and cephalopod resources and the technical capabilities of the small-scale mechanized trawler fleet, operating in Indian waters. The system consists of a four-panel semipelagic trawl with double bridles, front weights and vertically cambered high aspect ratio otter boards that can selectively harvest fast-swimming demersal and semipelagic finfishes and cephalopods, which are generally beyond the reach of conventional bottom trawls, currently used in commercial trawl fisheries in India. Indian Ranger Forest Officers—participants of the WII-GIZ training course on coastal and marine biodiversity and MPA management—getting information on the newly introduced SPTS developed by CIFT, along with the team of Mangrove Cell Maharashtra and UNDP-GEF project team (Malvan Jetty, Maharashtra, January 2015)

  - Use of small gauge gillnets leads to increased accidental capture of juvenile fish
  - Placement of gillnets across river mouths leads to massive catch, including nontarget species, leading to population decline – Capture of undersized individuals of molluscs for commercial utilization, reduction of population levels and breeding success
- Use of explosives and poisons for fishing causes massive and unselective mortality of aquatic fauna and has led to the destruction of coral reefs.

The Code of Conduct for Responsible Fisheries, of the Food and Agriculture Organization of the United Nations, which is still voluntary in nature, seeks to ensure that the fisheries sector commits itself to biodiversity-friendly fisheries practices.

9.7.3 Shipping and trade

Threat to coastal marine biodiversity also comes from invasive alien aquatic species, especially in geographically and evolutionary isolated ecosystems, such as small island developing states. Risks are increasing due to growing global trade, transport, tourism and climate change. One specific case is where the shipping industry is responsible for the spread of invasive species carried by the ships in the ballast water. Ballast water is the water that a ship pumps into tanks in the hull to add weight and improve stability. The ballast water is pumped in or discharged at ports to balance the load that the ship has taken in or delivered.

Thus, the ballast water that has been sucked in at one port could be discharged in another port in another continent. In the process the ship can take in aquatic species from one location and discharge into another.

In this case, biodiversity concerns are being integrated in the shipping sector via the Ballast Water Management Convention,1 adopted in 2004, which aims at preventing the spread of harmful aquatic organisms from one region to another, by establishing standards and procedures for the management and control of ships' ballast water and sediments. Under the convention, all ships in international traffic are required to manage their ballast water and sediments to a certain standard, according to a ship-specific ballast water management plan.

9.7.4 Tourism

Tourism is one of the world's fastest growing industries. It also a source of increasing stress on fragileecosystems. Its social, economic and environmental impacts are immense and complex, not least because tourism concentrates on vulnerable natural and cultural sites. The challenge is therefore to ensure that tourism is developed in harmony with environmental considerations.

The CBD Guidelines on Biodiversity and Tourism Development are a comprehensive instrument developed within the framework of the Convention on Biological Diversity to achieve more sustainable tourism development.

They are conceived as a practical tool providing technical guidance to policy makers, decision makers and managers with responsibilities covering tourism and/or biodiversity, whether in national or local government, the private sector, indigenous and local communities, nongovernmental organizations and other organizations, on ways of working together with key stakeholders involved in tourism and biodiversity (CBD 2004).

Marine and coastal tourism Coastal and maritime tourism can also provide a trade opportunity for developing countries to conserve and protect ecosystems and species. Instead of overexploiting marine resources, marine and coastal areas can be used for sustainable tourism and recreation. If carefully designed, activities such as surfing, wind surfing and sea kayaking can be developed into sustainable tourist attractions (Ghosh 2011). Marine Protected Areas (MPAs) are another way that marine regions can develop a sustainable tourism industry by catering for activities such as recreational fishing, whale watching and scuba diving. MPAs serve to conserve resources and consequently benefit surrounding areas through protecting species migration and enhanced recruitment. MPAs have grown in popularity amongst tourists in recent years (Aas et al. 2008; Hoyt 2001; Hollingworth and Pitcher 2002 | UNEP 2013).

The tourism industry is dependent on a wide variety of ecosystem services. Tourist activities in coastal areas often focus on diverse marine resources such as coral reefs, whales, and birdlife, and require clean water resources for activities such as swimming and scuba diving. Tourism revolving around wildlife viewing (e.g. safari) requires intact and healthy ecosystems in order to support species populations. National parks are often located in forested and mountainous areas and rely

on the services of functioning ecosystems to provide visitors with opportunities for recreational, educational, and cultural experiences (CBD 2009).

Nature-based tourism and dive tourism produce much of the economic value of coral reefs—an estimated$30 billion each year. Studies indicate that the economic value of coastal ecosystems as tourism destinations is strongly correlated to local environmental conditions. As reef ecosystems are degraded, nature-based tourism industries stand at risk. Destruction of coral reefs in Jamaica and Barbados, for example, has resulted in dramatic declines in visitation and revenue loss, which in turn has led to social unrest (MEA 2005). The value of coral reefs is estimated between US$100,000 and $600,000 per square kilometre a year. Meanwhile, the estimated costs of protecting them, through the management costs of a marine protected area, is just US$775 per square kilometre per year (UNEP-WCMC 2006 | CBD 2009).

Tourism has traditionally been a source of financing for protected areas, and this contribution is growing (see Eagles and Hillel 2008). Recognising the CBD's ambitious protected area targets (between 10 and 12% of all relevant ecosystems legally protected by 2010 and 2015, respectively for terrestrial and marine ecosystems, see SCBD 2006), and the funding gaps between available and needed resources, many CBD Parties are proposing to increase the flow of resources from tourism to protected areas through concessions, enhancement of attractions and equipment, marketing, and capacity building for park agencies. Visitation revenues and tourism partnerships are particularly targeted as funding sources in developing destinations (CBD 2009).

Main Sources

Christian, C., Ainley, D., Bailey, M., Dayton, P., Hocevar, J., LeVine, J., Jennifer, J., (2013). A review of formal objections to Marine Stewardship Council fisheries Certifications. Biological Conservation, ELSEVIER.

Christie, P. and A. T. White (2006). Best Practices in Governance and Enforcement of Marine Protected Areas: An Overview Background Paper – 4 for FAO Expert Workshop on Marine Protected Areas and Fisheries Management - Review of Issues and Considerations.

Dahdouh- Guebas, F. (2002). The use of remote sensing and GIS in the sustainable management of tropical coastal ecosystems. Environment, Development and Sustainability, Kluwer Academic Publishers.

Retrieved from http://www.ulb.ac.be/sciences/biocomplexity/pub/Dahdouh-Guebas_2002_ENVI.pdf on 28.09.2015.

Ecolabels and marine capture fisheries. Private standards and certification in fisheries and aquaculture – Current practice and emerging issues.

Ehler, C., Douvere, F. (2009). Marine spatial planning: A Step-by-Step Approach toward Ecosystem based Management. Intergovernmental Oceanographic Commission.

Frey, B., Olearius A., Palerm, J. (2011). Strategic Environment Assessment – a governance tool for sustainable development. BMZ, Federal Ministry for economic cooperation and development, GIZ.
Global Code of Ethics for Tourism: For Responsible tourism (2001). UNWTO.

Guide to Good Practices for Sustainable Tourism in Marine-Coastal Ecosystems: Lodging Businesses. Rainforest Alliance, Conservational international, Global Environment Facility, PNUMA.

Guidelines for the ecolabelling of fish and fishery products from marine capture fisheries (2009). Food and agriculture organization of the United Nations.

Guidelines on biodiversity and tourism development: International guidelines for activities related to sustainable tourism development in vulnerable terrestrial, marine and coastal ecosystems and habitats of major importance for biological diversity and protected areas, including fragile riparian and mountain ecosystems (2004). Secretariat of the Convention on Biological Diversity, Montreal.

Impact Assessment and Project Appraisal. Tourist development plan: Mumbai Suburban- A report on assessment of tourism projects in Mumbai and proposed interventions. Maharashtra tourism and Development Corporation.

Khera, N., Kumar, A., (2010). Inclusion of biodiversity in environmental impact assessments (EIA): a case study of selected EIA reports in India. Impact Assessment and Project Appraisal.

Korn, H., Schliep, R., Stadler, J. (eds). 2003. Report of the international workshop on the 'Further Development of the Ecosystem Approach' at the International Academy for Nature Conservation, Isle of Vilm, Germany, 9–11 October 2002—including a compilation of case-studies and lessons learned, BfN-Skripten 78, 2003. Available at http://www.bfn.de/fi leadmin/MDB/documents/skript78.pdf

Khera, N., Winkler, S., Krolopp, A. 2010. Policy-response towards achieving the biodiversity targets— 2010 and beyond: research questions for developing indicators to assess progress. Journal of Resources, Energy and Development 7(1): 11–28.

Khera, N., Mathur, V.B., Sivakumar, K., Yadava, Y., D'monte, D., Warrier, S.G., Dave, S., Mukherjee, R., Hariprakash, V. 2013. Capacity development needs for sustainable management of marine and coastal protected areas in India: a cross-sector assessment. In: Sivakumar, K. (ed), Coastal and marine protected areas in India: challenges and way forward. ENVIS Bulletin: Wildlife & Protected Areas, Vol. 15, Wildlife Institute of India, Dehradun- 248001, India. 264–273 pp.

Neeraj Khera and Ajay Kumar (2010) Inclusion of biodiversity in environmental impact assessments (EIA): a case study of selected EIA reports in India. Impact Assessment and Project Appraisal. 28 (3): 189-200

Plakos, M. (2007).GIS for Ocean Conservation. ESRI. Retrieved from http://www.esri.com/library/bestpractices/ocean-conservation.pdf on 28.09.2015

Rubec, P. J., Ferdinand, P. C., Jamir, T. V., Ruwindrijarto, A., (2009) Use of Remote Sensing and Geographic Information Systems to Support Spatial Management and Conservation of Marine Resources in Tropical Countries. Retrieved from http://www.safmc.net/Meetings/APandComm/Hab09/Attach20RubecCruz-WOCPaperHabAPAug1109.pdf on 29.09.2015

Sectors in the Sindhudurg coast, Maharashtra: Progress report 2013. Mangrove cell Maharashtra Forest department. Retrieved from http://www.mangrovecell.org/Attachments/Progress%20UNDP%20 Sindhudurg%20Project%202013.pdf on 29.09.2015.

Secretariat of the Convention on Biological Diversity. 2011. NBSAP training modules version 2.1—Module 3. Mainstreaming biodiversity into national sectoral and cross-sectoral strategies, policies, plans and programs. Montreal, June 2011. Available at http://www.cbd.int/doc/training/nbsap/b3-trainmainstream-revised-en.pdf downloaded on 10 August 2012.

Secretariat of the Convention on Biological Diversity (2012) Cities and Biodiversity Outlook. Montreal, 64 pages

Sustainable Marine Biodiversity Conservation: Linking Tourism to Marine and Coastal Protected Areas(2002). IUCN M&E Initiative.Tourism for development and nature conservation: Resources for tourism planners and practitioners.The Convention on Biological Diversity (CBD). Retrieved from https://www.cbd.int/doc/publications/development/brochure-tourism-en.pdf on 30.09.2015.

Tourism for Nature and Development: A Good Practice Guide (2009). Secretariat of the Convention on Biological Diversity, World Tourism Organization and the United Nations Environment Programme Montreal. Retrieved from https://www.cbd.int/development/doc/cbd-good-practice-guide-tourismbooklet-web-en.pdf

UNEP. (2013). Green Economy and Trade _ Trends, Challenges and Opportunities. Retrieved from http://www.unep.org/greeneconomy/GreenEconomyandTrade

Wedding, L. M., Gibson, B.A., Walsh, W. J., Battista, T. A. (2011). Integrating remote sensing products and GIS tools to support marine spatial management in West Hawai`i. Journal of Conservation Planning Vol 7. Retrieved from http://www.journalconsplanning.org/2011/JCP_v7_5_Wedding.pdf on 28.09.2015.

Department of Environment, Food, and Rural Affairs (Defra), 2009. Our seas—a shared resource—high level marine objectives. Defra: London. 12 p.) UNESCO, 2009.

Further Resources

Secretariat of the Convention on Biological Diversity (2011) NBSAP training modules version 2.1 _ Module 3. Main- streaming biodiversity into national sectoral and cross-sectoral strategies, policies, plans and programs. Montreal, June 2011. http://www.cbd.int/doc/training/nbsap/b3-trainmainstream-revised-en.pdf downloaded on Aug 10 2012

Secretariat of the Convention on Biological Diversity, Netherlands Commission for Environmental Assessment (2006). Biodiversity in Impact Assessment, Background Document to CBD Decision VIII/28: Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment, Montreal, Canada, x _ y pages. http://www.cbd.int/doc/publications/cbd-ts-26-en.pdf downloaded on Aug 15 2012

EIA practice in India and its evaluation using SWOT analysis http://faculty.mu.edu.sa/public/uploads/1338109827.3611EIA-20.pdf