

Bay of Bengal Large Marine Ecosystem

Strategic Action Programme

2015



The following national partners led the development of this Strategic Action Programme.



BANGLADESH: Ministry of Fisheries and Livestock • Ministry of Environment and Forests
• Bangladesh Fisheries Research Institute



INDIA: Ministry of Agriculture - Department of Animal Husbandry, Dairying and Fisheries
• Ministry of Environment, Forests and Climate Change • Fishery Survey of India



INDONESIA: Ministry of Marine Affairs and Fisheries - Directorate General of Capture Fisheries
• Ministry of Environment and Forestry - Coastal and Marine Environmental Degradation Control



MALAYSIA: Ministry of Agriculture and Agro-Based Industry - Department of Fisheries • Ministry of Natural Resources and Environment - Department of Environment • Fisheries Research Institute



MALDIVES: Ministry of Fisheries and Agriculture • Ministry of Environment and Energy - Environment Protection Agency • Marine Research Centre



MYANMAR: Ministry of Livestock, Fisheries and Rural Development - Department of Fisheries
• Ministry of Environmental Conservation and Forestry



SRI LANKA: Ministry of Fisheries and Aquatic Resources Development • Ministry of Mahaweli Development and Environment



THAILAND: Ministry of Agriculture and Cooperatives - Department of Fisheries • Ministry of Natural Resources and Environment - Department of Marine and Coastal Resources



The contents of this document have been developed by representatives of the governments of Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka, Thailand, mainly through their respective fisheries and environmental agencies.

The contents of this document do not necessarily reflect the views or policies of the Food and Agriculture Organization of the United Nations, the Global Environment Facility or any of the other contributing organizations.

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2015



Endorsement of the Strategic Action Programme

A healthy ecosystem and sustainable use of marine resources for the benefit of the people and countries of the Bay of Bengal Large Marine Ecosystem

The sovereign states of Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand

Confirming that the major transboundary issues affecting the health of the Bay of Bengal Large Marine Ecosystem identified through the Transboundary Diagnostic Analysis need to be addressed immediately

Recognising that the BOBLME Strategic Action Programme, which has been based on the Transboundary Diagnostic Analysis, is a well constructed and consulted plan that will underpin sustainable development

Understanding that the successful application of the ecosystem approach to management will require the national agencies responsible for fisheries, the environment and other marine matters, to work closely together

Aware of the need to integrate and mainstream the recommended actions into national work plans

Acknowledging that the BOBLME countries have different development priorities, governance approaches and capacity development needs, but are united and committed to work together to better the lives of the coastal populations through improved regional management of the Bay of Bengal environment and its fisheries

Do hereby endorse the BOBLME Strategic Action Programme and agree to work collaboratively to achieve its objectives.



BANGLADESH

Ministry of Fisheries and Livestock

Ministry of Environment and Forests



INDIA

Ministry of Agriculture

Ministry of Environment, Forests
and Climate Change



INDONESIA

Ministry of Marine Affairs and Fisheries

Ministry of Environment and Forestry



MALAYSIA

Ministry of Agriculture and Agro-Based Industry

Ministry of Natural Resources and Environment



MALDIVES

Ministry of Fisheries and Agriculture

Ministry of Environment and Energy



MYANMAR

Ministry of Livestock, Fisheries and Rural
Development

Ministry of Environmental Conservation
and Forestry



SRI LANKA

Ministry of Fisheries and Aquatic Resources
Development

Ministry of Mahaweli Development and
Environment



THAILAND

Ministry of Agriculture and Cooperatives

Ministry of Natural Resources and Environment

Abbreviations and acronyms

ACB	ASEAN Centre for Biodiversity	IUU	Illegal Unregulated and Unreported (Fishing)
ADB	Asian Development Bank	LME	Large Marine Ecosystem
AIT	Asian Institute of Technology	LOICZ	Land-Ocean Interactions in the Coastal Zone
APFIC	Asia-Pacific Fishery Commission	MARPOL	International Convention for the Prevention of Pollution from Ships
ASEAN	Association of South East Asian Nations	MCS	Monitoring Control and Surveillance
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation	MDG	Millennium Development Goals
BOBLME	Bay of Bengal Large Marine Ecosystem	M&E	Monitoring and Evaluation
BOBP-IGO	Bay of Bengal Programme – Intergovernmental Organization	MFF	Mangroves for the Future (an IUCN body)
CBD	Convention on Biological Diversity	MPA	Marine Protected Area
CCA	Climate Change Adaptation	MSP	Marine Spatial Planning
CCRF	Code of Conduct for Responsible Fisheries	NACA	Network of Aquaculture Centres in Asia-Pacific
CERMES	Centre for Resource Management and Environmental Studies	NAP	National Action Programme
CITES	Convention on International Trade in Endangered Species (of wild fauna and flora)	NEWS	Nutrient Export from Watersheds
CMS	Convention on Migratory Species	NGO	Non-governmental Organization
COFI	Committee on Fisheries (of FAO)	NOAA	National Oceanic and Atmospheric Administration of the United States
CPUE	Catch Per Unit Effort	NORAD	Norwegian Agency for Development Cooperation
CCR-BOBLME	Consortium for the Conservation and Restoration of the BOBLME	NPOA	National Plan of Action
CSR	Corporate Social Responsibility	PEMSEA	Partnerships in Environmental Management of the Seas of East Asia
DRM	Disaster Risk Management	PPP	Public Private Partnerships
EA	Ecosystem Approach	PSC	Project Steering Committee
EAFM	Ecosystem Approach to Fisheries Management	RPOA	Regional Plan of Action
EBSA	Ecologically or Biologically Significant Areas	SAARC	South Asia Association for Regional Cooperation
EcoQO	Ecosystem Quality Objective	SACEP	South Asia Cooperative Environment Programme
EEZ	Exclusive Economic Zone	SAP	Strategic Action Programme
ETP	Endangered Threatened and Protected (species)	SEAFDEC	Southeast Asian Fisheries Development Center
FAO	Food and Agriculture Organization	SIDA	Swedish International Development Cooperation Agency
FFI	Flora and Fauna International	SME	Small and Medium Enterprises
GCRMN	Global Coral Reef Monitoring Network	SSF	Small Scale Fisheries
GEF	Global Environment Facility	TDA	Transboundary Diagnostic Analysis
GDP	Gross Domestic Product	TWAP	Transboundary Waters Assessment Programme
GESAMP	Group of Experts on the Scientific Aspects of Marine Environmental Protection	UNCLOS	United Nations Convention on the Law of the Sea
GPA	Global Programme of Action for the Protection of the Marine Environment from Land-based Activities	UNDP	United Nations Development Programme
GPNM	Global Programme on Nutrient Management	UNEP	United Nations Environment Programme
HDI	Human Development Index	UN-ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
ICM	Integrated Coastal Management	UNESCO	United Nations Educational, Scientific and Cultural Organization
ICRI	International Coral Reef Initiative	UNGA	United Nations General Assembly
ICSF	International Collective in Support of Fishworkers	UNFSA	United Nations Fish Stocks Agreement
IGBP	International Geosphere Biosphere Programme	VME	Vulnerable Marine Ecosystem
ILO	International Labour Organization	VMS	Vessel Monitoring System
IOGOOS	Indian Ocean Global Ocean Observing System	WB	World Bank
IOC	Intergovernmental Oceanographic Commission	WCMC	World Conservation Monitoring Centre
IOSEA	Indian Ocean-South East Asian Marine Turtle Memorandum of Understanding	WWF	Worldwide Fund for Nature
IOTC	Indian Ocean Tuna Commission		
IUCN	International Union for the Conservation of Nature		

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**ASEAN -
SEAFDEC**

Plan of action on sustainable fisheries for food security for the ASEAN region towards 2020:

Planning and information, fisheries management, marine fisheries

CBD

Convention on Biological Diversity goals

Target 6: Applying ecosystem based approaches

Target 8: Reducing pollution

Target 10: Minimising anthropogenic pressures in vulnerable ecosystems

Target 11: Marine Protected Area objectives

CMS

Convention on Migratory Species goals:

Sea turtles memorandum of understanding

Sharks

COFI

FAO Committee on Fisheries goals:

Implementing the Code of Conduct for Responsible Fisheries and developing National Plans of Action,

Voluntary Guidelines for Securing Small Scale Fisheries

FAO-CWP

Improvement of fisheries statistics in accordance with FAO Coordinating Working Party goals

GPA

UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based activities:

National Plans of Action

IOTC

India Ocean Tuna Commission

Resolution 10/05: Technical capacity development in fisheries statistics and assessment

Resolution 05/05: Conservation of sharks caught in association with fisheries of the IOTC

MDG

Millennium Development Goal 7:

Ensure environmental sustainability

UNCLOS

UN Convention on the Law of the Sea

Article 63: Stocks occurring within the EEZs of two or more coastal states

Article 143: Marine scientific research

UNFSA

UN Fish Stocks Agreement

Article 7: Compatibility of management measures

Article 8: Cooperation for conservation and management

Article 10: Functions of regional fisheries management arrangements

UNGA

UN General Assembly on Regular Process (60/30) for global assessment of the state of the marine environment, including socio-economic aspects Sustainable Fisheries (68/71)

MARPOL

International Convention for the Prevention of Pollution from Ships

Article 1: General obligations

International obligations and commitments,* national priorities and work plans for fisheries, environment, pollution and social development



Applying ecosystem approaches that focus on processes and decision-making that balance ecological and human well-being

** Individual BOBLME countries may not subscribe to all the international obligations and commitments listed above*



The SAP at a glance



Collaboration with the wide range of partners active in the region



- Fisheries and other marine living resources are restored and managed sustainably
- Degraded, vulnerable and critical marine habitats are restored, conserved and maintained
- Coastal and marine pollution and water quality are controlled to meet agreed standards for human and ecosystem health
- Social and economic constraints are addressed, leading to increased resilience and empowerment of coastal people

A healthy ecosystem and sustainable use of marine living resources for the benefit of the people and countries of the Bay of Bengal Large Marine Ecosystem



Introducing the Bay of Bengal

What is a Large Marine Ecosystem?

The world's 64 Large Marine Ecosystems (LMEs) produce more than 80 percent of the global marine fisheries catch. At the same time, they include some of the most degraded habitats in the world.

LMEs are defined on the basis of their bathymetry, hydrography, productivity and trophic interactions. They are scientifically defined areas in which ecosystem management approaches may be applied. LMEs encompass a range of habitats, from river basins and estuaries to the seaward boundaries of continental shelves and the high seas.

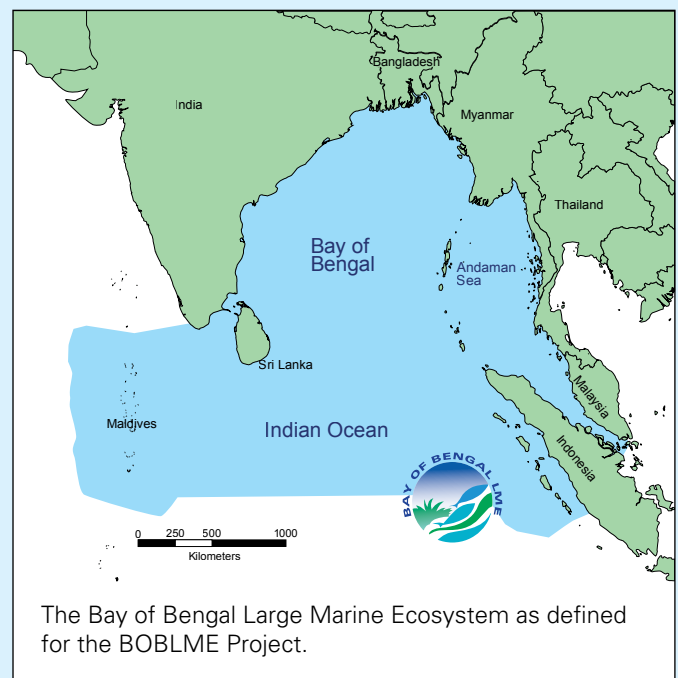
The Bay of Bengal Large Marine Ecosystem is one of the largest LMEs; it covers over 6 million km² of sea.

The Bay of Bengal Large Marine Ecosystem (BOBLME) Project

The eight countries surrounding the Bay of Bengal – Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand – committed themselves to work together through the Bay of Bengal Large Marine Ecosystem (BOBLME) Project to better the lives of the coastal populations through improved regional management of the Bay of Bengal environment and its fisheries.

The BOBLME Project began in April 2009 and ran until December 2015. FAO was the executing agency. The BOBLME Project was principally supported by the Global Environment Facility (GEF), the Norwegian Agency for Development Cooperation (NORAD), Sweden through the Swedish International Development Cooperation Agency (SIDA), the Food and Agriculture Organization of the United Nations (FAO), the National Oceanic and Atmospheric Administration of the USA (NOAA) and the World Bank.

The BOBLME Project implemented a wide range of activities relating to the conservation and management of fisheries and the marine environment.



The BOBLME Project

- expanded knowledge and strengthened understanding of the ecological, human and governance dimensions of the Bay of Bengal through its reviews, research, working groups and expert workshops
- increased awareness of transboundary issues by undertaking a Transboundary Diagnostic Analysis which is the basis of this Strategic Action Programme; and strengthened the capacity of participating countries to implement it
- provided many new opportunities for scientists from the region to collaborate, and for them to interact with policy makers (both within and between countries) through regional meetings and exchange fora. It also facilitated many collaborations and partnerships between the bodies and agencies working in the region
- enhanced awareness of BOBLME-related issues through networking, partnerships and communication in the form of advisories, websites, newsletters, flyers, posters and videos.

Large Marine Ecosystem

The Bay of Bengal Large Marine Ecosystem

- provides food for nearly 400 million people
- features important critical habitats: mangroves, coral reefs and seagrass beds
- features a high degree of biodiversity and a large number of endangered and vulnerable species
- provides fisheries livelihoods for 5 million people
- provides ecosystem services worth USD70 billion per year
- produces 7% of the value of the world's fish catch
- includes eight countries with diverse cultures, religions, political and biological systems
- supports a thriving shipping and maritime industry

Area

- Total maritime area: 6.2 million km²
- Total area of EEZs: 4.3 million km²
- Combined length of coastline: 14 000 km

Environment

- 8% of the world's mangroves
- 12% of the world's coral reefs
- Some of the largest estuaries in the world

Fisheries

- Number of fishers: 3.7 million
- Number of fishing boats: 415 000
- Annual fisheries production: 6 million tonnes
- Value of fisheries production: USD4 billion

People

- Total population of countries: 2 000 million
- Population of coastal zone: 185 million



1 INTRODUCTION

1.1 Five reasons for the SAP

1. The pressure on marine resources is reaching critical levels

Over 450 million people live in the Bay of Bengal area and their numbers are increasing rapidly. The majority of these people are poor and vulnerable and they rely heavily on marine resources which are being exhausted by:

- overfishing
- removal or degradation of important coastal marine habitats
- land- and marine-based sources of pollution

2. There is a need to take action to meet global expectations

The BOBLME countries have different development priorities, governance approaches and capacity development needs. This SAP demonstrates that Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand are aware of the major issues affecting the health of the Bay of Bengal and are committed to work together to better the lives of the coastal populations through improved regional management of the Bay of Bengal environment and its fisheries.

By implementing the SAP, the countries will continue to demonstrate that they are actively addressing their obligations on a range of international agreements and commitments.

3. Sustainable development requires a well constructed and agreed plan

The SAP has been agreed to by all eight countries of the BOBLME. It is the product of many years of reflection, assessment and consultation. The SAP interventions are safeguards that improve food security and create opportunities for sustainable economic growth and environmental protection.

Furthermore, donor support for improving the health of the Bay of Bengal will hinge on the existence of a comprehensive, agreed programme of work such as this SAP.

4. The SAP will provide an engagement and coordination mechanism for countries and their agencies

Regional collaboration holds the greatest promise of positive change because many of the key challenges in the highly complex BOBLME are transboundary in nature.

The BOBLME Project had considerable success in bringing together the eight countries of the Bay of Bengal and their national fisheries and environment agencies to work together on common issues. However, there is both a need and opportunity to improve inter-agency coordination and engagement.

Building on the good work of the BOBLME Project, it is envisaged that the SAP will provide BOBLME countries with a stronger mandate to continue their collaboration to address transboundary issues. There are strong incentives for a wider range of national marine management agencies to implement SAP activities and in doing so better interact with each other on SAP issues in the first instance but other common issues in the future.

Cooperation between countries on issues of shared interest offers real advantages for capacity development, sharing of experiences and effective action.

5. Business as usual is not an option

If the SAP is not implemented, BOBLME countries can anticipate a future in which:

- the marine environment will continue to deteriorate, further threatening biodiversity and coastal ecosystems
- major fisheries will face serious declines, with resulting negative impacts on national economies, the fishing industry and food security
- there will be negative impacts on the livelihoods of fishing communities in all countries
- there will be increasing conflict between marine stakeholders for access to and use of resources.

- Business as usual is not an option
- SAP implementation is an investment in a sustainable future

This SAP is the product of a rigorous analytical and consultative process

This Strategic Action Programme (SAP) is based on the Transboundary Diagnostic Analysis (TDA) which was endorsed in March 2012 by the eight countries of the BOBLME. The TDA draws on over ten years of studies, reviews and analyses. It identifies the main transboundary issues and their causes, and it reviews the driving forces at work in the BOBLME, such as the socio-economic, institutional, legal and administrative circumstances and the projected impact of climate change on the region. These forces all pose a range of constraints and challenges and have the potential to influence the success of actions implemented to address the main areas of concern.

The SAP is a negotiated policy document that sets out a programme of actions which address the causes of the major fisheries, environmental and social and economic issues. The development of the SAP has been guided by the BOBLME Project Steering Committee which comprised senior-level government officers from the fisheries and environmental agencies in each country.

Transboundary Diagnostic Analysis

Identification of the major shared issues affecting the Bay of Bengal Large Marine Ecosystem

- Expert analysis of the issues and causes of the problems
- National consultations to agree on the issues and causes
- Regional consultations to confirm the document
- Endorsement by the Project Steering Committee

Strategic Action Programme

Development of a comprehensive plan to address the major shared issues affecting the Bay of Bengal Large Marine Ecosystem

- Consultations to identify the ecosystem quality objectives for each of the TDA issues
- Consultations to identify the actions that should be taken
- National/regional consultations and agreement on the SAP
- Adoption of the SAP



1.2 A long-term vision for the Bay of Bengal

- Stakeholders working together for the common good
- Enough fish for future generations
- Healthy marine habitats
- Reduced pollution from agriculture, industry, shipping and large coastal cities
- Coastal communities resilient to climate change and improving their living and working conditions

A healthy ecosystem and sustainable use of marine living resources for the benefit of the people and countries of the Bay of Bengal Large Marine Ecosystem

The Strategic Action Programme

- **demonstrates** that the countries are aware of the major issues affecting the health of the Bay of Bengal
- **identifies** actions that will make a significant difference
- **confirms** that the countries are willing to work together to bring about change



1.3 Underlying principles and concepts for the SAP

The following fundamental principles and concepts will guide the implementation of the SAP.

- **Government commitment:** ministerial signatures affirming commitment and cooperation between the countries.
- **Ecosystem approach:** adopting strategies for the integrated management of land, water and living resources that promotes conservation and sustainable use. Decision-making processes balance environmental and social well-being within improved governance frameworks.
- **Precautionary approach:** acknowledging that where there are threats of serious or irreversible damage, a lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
- **Adaptive management:** implementing management where agreed long-term environmental goals are achieved in a series of pragmatic, action-based steps. In each step, agreed achievement indicators are monitored and used in planning the next step – a process of learning by doing.
- **Knowledge and information:** basing decisions on best available knowledge and learning through adaptive management.
- **Gender-sensitivity:** ensuring the continuous provision of gender inputs throughout SAP implementation.
- **Subsidiarity:** solving transboundary issues through coordinated action at the appropriate level, regionally, nationally or locally.
- **Capacity development:** strengthening institutions and building human capacity within management agencies and stakeholder groups to assist in implementing the SAP.
- **Human rights based approach to sustainable development:** promoting non-discrimination, meaningful participation in decision making, openness, transparency and accountability of governments to meet their obligations to respect, fulfil and protect the rights of people.
- **International commitments:** through their commitment to the BOBLME SAP, the countries will take actions that contribute to a wide range of international obligations.



2 STATE OF THE BAY OF BENGAL

2.1 Overexploitation of marine living resources

The major issues are:

1. Declining fish availability
2. Changing species composition
3. High proportions of juvenile fish in catches and landings
4. Changes in biodiversity, including vulnerable and endangered species

In particular ...

- Many stocks are shared through migration of fish or larvae
- Fishing (both legal and illegal) overlaps national jurisdictions—overcapacity and overfishing in one location forces a migration of fishers and vessels to other locations
- All countries (to a lesser or greater degree) are experiencing difficulties in implementing fisheries management, especially the ecosystem approach
- BOBLME countries contribute significantly to the global problem of loss of vulnerable and endangered species

... mainly caused by ...

- excessive fishing effort
- destructive fishing methods
- unselective fishing practices and gear
- illegal, unregulated and unreported (IUU) fishing

... for these underlying reasons:

- open access regimes
- government emphasis on increased production
- inappropriate subsidies
- increasing fishing effort, especially trawlers and purse seiners
- high consumer demand for fish, including for seed and fish meal for aquaculture
- weak fisheries monitoring, control and surveillance and enforcement
- strong incentives to encroach into areas with better returns.

Scientific surveys reveal declining fish catches and catch rates; fishers need to fish further offshore; and large, more valuable fish are less common

In some fisheries, up to 50% of the catch is immature fish that did not have a chance to reproduce. Marine turtles and dugongs face serious threat from fishing and habitat loss, while sharks and rays continue to face high fishing rates



2.2 Degradation of mangroves, coral reefs and seagrass

The major issues are:

1. Loss and degradation of mangrove habitats
2. Degradation of coral reefs
3. Loss and damage to seagrasses

In particular ...

- All three critical habitats occur in all BOBLME countries
- Development impacting on coastal habitats is common in all BOBLME countries
- Trade in products from all the habitats is transboundary
- Climate change impacts are shared by all BOBLME countries

... mainly caused by ...

- conversion of mangroves for agriculture, aquaculture (shrimp), and salt production
- expanding coastal development
- lack of clear land tenure
- unsustainable logging of mangroves
- increasing pollution, eutrophication and sedimentation
- destructive fishing practices (poisons, explosives, trawling and push-netting)
- coastal modification, including coral and sand mining, dredging and reclamation
- natural causes, especially coral bleaching

... for these underlying reasons:

- food security needs of the coastal poor
- lack of coastal development plans
- increasing trade (both domestic and export) for habitat-related products
- coastal development and industrialization
- insufficient and ineffective Marine Protected Areas and lack of enforcement
- intensive upstream agriculture practices
- upstream development that affects water flow
- increasing tourism
- climate change.

More than 20% of mangrove habitat has been lost since the 1980's; and coral bleaching and human activities continue to reduce the area and quality of coral reefs

The global rate of seagrass loss has been over 100 km² each year since 1980, and most seagrass beds in the Bay of Bengal are already considered to be degraded or threatened



2.3 Pollution and water quality

The major issues are:

1. Sewage-borne pathogens and organic load entering coastal waters
2. Dumping and accumulation of oil, solid waste and marine litter
3. Increasing nutrient inputs

In particular ...

- Discharge of untreated/partially treated sewage into coastal waters
- Sewage and organic discharges from the Ganges-Brahmaputra-Meghna and Ayeyarwady systems are likely to cross national boundaries
- Plastics and derelict fishing gear can be transported long distances across national boundaries
- High nutrient discharges from rivers could intensify large scale hypoxia
- Atmospheric transport of nutrients is inherently transboundary
- Differences between countries with regard to regulations and enforcement of shipping discharges may drive discharges across boundaries
- Tar balls caused by oil discharges are transported long distances

... mainly caused by ...

- discharge of untreated or inadequately treated domestic, industrial and agricultural wastewater
- inadequate solid waste management, including solid waste disposal and open burning of solid waste
- increasing emission of nutrients from fertilizer use in agriculture
- expanding aquaculture
- atmospheric emissions from industry and fossil fuel burning

Large numbers of marine species are at risk from entanglement and ingestion of marine litter. Solid waste is accumulating in coastal areas and causes damage to tourism

Over 90% of sewage in South Asian countries is released with little or no treatment, and high levels of sewage bacteria are present in the estuaries and coastal waters of most Bay of Bengal countries

... for these underlying reasons:

- increasing coastal population density and urbanization
- migration of industry into BOBLME countries, and a proliferation of small industries
- inadequate investment in wastewater management and wastewater treatment
- lack of awareness of policy makers, legal system and civil society
- lack of reception facilities for used oil and oily wastes
- lack of enforcement of environmental regulations
- increasing per capita consumption and waste generation
- low per capita GDP and high levels of poverty.



2.4 Social and economic concerns

The major issues are:

1. Relatively low standard of living and working conditions of people involved in fishing
2. Coastal people are often unable to participate in and benefit from sustainable development practices
3. Vulnerability of coastal communities to natural hazards, climate variability and change

In particular ...

- Low and insecure levels of income
- Inadequate representation of fisherfolk's concerns and needs
- Poor and hazardous health and safety conditions
- Poor access to markets
- Considerable financial dependence on "middlemen"
- Gender inequality
- Trafficking and exploitation of migrant workers
- Presence of child labour and forced labour

... mainly caused by ...

- undervaluing the importance of small-scale fisheries
- inadequate social protection strategies
- absence of social dialogue
- limited attention given to the needs of small-scale fishers and their communities
- low educational attainment

... for these underlying reasons:

- poverty and lack of access to basic services
- failure to apply a human rights-based approach
- insecure tenure rights/loss of rights
- failure to apply recognized labour standards
- inadequate investment in services for coastal communities
- climate change.

More than 50% of the world's coastal poor live in countries that border the Bay of Bengal and they lack decent work and living conditions. Fishing at sea is among the most dangerous occupations in the world

Small-scale fishing communities are among the poorest and are further marginalized by a failure to recognize the importance of fisheries. Women play a major role in fisheries but gender inequalities persist

The Bay of Bengal is subject to frequent cyclones causing loss of human lives and loss and damage to livelihoods



3 THE STRATEGIC ACTION PROGRAMME

3.1 How the SAP was developed

The SAP has been developed over a five year period through a comprehensive series of reviews, analyses and (national and regional) consultations, starting with the TDA.

2009	April	BOBLME Project starts
	October	TDA – existing (framework) TDA review and gap analysis completed
2010	January	TDA – updating of the existing TDA by experts begins
	August	TDA consultation planning (regional workshop)
	November	Updated TDA released for national consultations
2011	January	TDA consultations start Myanmar
	February	TDA consultations start Thailand
	April	TDA consultations start India
	May	TDA consultations start Sri Lanka, Bangladesh, Malaysia
	September	TDA consultations start Indonesia, Maldives
	December	TDA – all national consultations completed
2012	February	TDA endorsed after recommendations from national consultations are reviewed (regional workshop)
	February	BOBLME vision and ecosystem quality objectives (EcoQOs), targets and indicators drafted and SAP document framework drafted (regional workshop)
	March	TDA endorsed by PSC
	March	SAP – first draft available; SAP vision and SAP framework and a plan for its completion endorsed by the PSC
	March	SAP drafting
	May	SAP – actions and indicators identified for Theme 1: overexploitation of living marine resources (regional workshop)
	June	SAP – actions and indicators identified for Theme 2: degradation of critical habitats (regional workshop)
	June	SAP – actions and indicators identified for Theme 3: pollution and water quality (regional workshop)
	December	TDA – after editing and formatting, final version of the TDA released
	December	SAP – regional and national actions compiled and sent to countries to undertake prioritization exercises
2013		SAP – national consultations to prioritize SAP and NAP actions Studies and reviews to develop Theme 4: Social and economic considerations
2014	April	SAP – regional and national action prioritization exercises completed by all countries
	April	SAP – draft updated to include regional and national actions
	June	SAP – design of SAP Implementation project begins
	August	SAP – national consultations on the draft SAP
	October	SAP – text and content adopted by the PSC
2015	January	Additional text on ecosystem services valuation adopted by the PSC
	March	SAP – final SAP sent to countries for signature

3.2 The SAP is built around four major themes

The framework for the BOBLME SAP was derived from the TDA and other studies undertaken as part of the BOBLME Project, and is based on four themes. These are marine living resources, critical habitats, water quality, and social and economic considerations, and they reflect major areas for action.

Moving from the TDA to the SAP included the following steps:

- confirming a regional vision (a high-level, long-term goal) for the BOBLME
- defining an ecosystem quality objective (a long-term objective) for each of the SAP themes
- identifying the major issues to be addressed, and
- associating each issue with objectives, targets, indicators and actions.

The TDA and supporting processes identified the major issues affecting the health of the Bay of Bengal and their causes under four themes

The SAP confirms four ecosystem quality objectives (EcoQOs), each with specific objectives, indicators, and targets

3.3 Prioritization of regional and national actions

Over 400 potential actions were identified by the technical experts who participated in three action planning workshops in May and June 2012. These actions include transboundary actions that would be coordinated through a regional mechanism under a second phase of the BOBLME Project; and selected national actions that would be undertaken by each country and recognized as contributing to SAP implementation.

Each country has identified the actions that are already being undertaken; the actions it would like to receive assistance for (to start or strengthen); and the actions it is not considering undertaking in the near future.

Where four or more countries identified actions they would like to start or strengthen, these actions were included in the regional activities list as “coordinated capacity development” actions.

Each country has proposed different subsets of actions according to its priorities, resources and capacity. Importantly, countries are already undertaking many of the actions. The suite of actions selected by each country will constitute its National Action Programme (NAP).

The responses to the SAP/NAP questionnaire process have been compiled to produce a NAP framework for each country.

Countries have prioritized the regional actions they want to collaborate on, and identified national actions they want to undertake in support of SAP implementation

The transboundary and national actions will be undertaken in the areas of:

- Institutional arrangements, legal and policy reforms
- Management measures
- Knowledge strengthening, awareness and communication
- Human capacity development

3.4 The BOBLME Strategic Action Programme vision and objectives

A healthy ecosystem and sustainable use of the people and countries of the Bay of Bengal

1

Theme:
Marine living resources

ECOSYSTEM QUALITY OBJECTIVE

Fisheries and other living marine resources have been restored and are managed sustainably

OBJECTIVES

1. Restore fishery resources that have declined
2. Restore and maintain species composition
3. Reduce the proportion of juvenile fish caught and/or retained
4. Restore biodiversity status level of 1980 by 2020

2

Theme:
Critical habitats

ECOSYSTEM QUALITY OBJECTIVE

Degraded, vulnerable and critical habitats are restored, conserved and maintained

OBJECTIVES

1. Protect, manage and restore mangrove habitats to increase mangrove coverage and improve biodiversity
2. Restore, protect and sustainably manage existing coral reef ecosystems, habitats and associated biodiversity, and prevent pollution and destructive activities
3. Protect and manage seagrass habitats and associated biodiversity (maintain and increase extent and biodiversity)

marine resources for the benefit of Large Marine Ecosystem

3

Theme:
Water quality

ECOSYSTEM QUALITY OBJECTIVE

Coastal and marine pollution and water quality are controlled to meet agreed standards for human and ecosystem health

OBJECTIVES

1. Reduce or minimize the discharge of untreated sewage and waste water into river, coastal and marine waters
2. Reduce and minimize solid waste and marine litter
3. Reduce and control nutrient loading into coastal waters

4

Theme:
Social and economic
considerations

ECOSYSTEM QUALITY OBJECTIVE

Social and economic constraints are addressed, leading to increased resilience and empowerment of coastal people

OBJECTIVES

1. Reduce vulnerability to natural hazards, climate variability and climate change, and increase climate resilience
2. Improve the living and working conditions of coastal fishing communities
3. Empower coastal people to participate in and benefit from sustainable development practices

3.4.1 Marine living resources targets, regional and national actions

Theme 1: Marine living resources

Fisheries and other marine living resources are restored and managed sustainably

Objective 1:

Restore fisheries resources that are degraded

Targets

- Increase abundance and biomass of selected national and transboundary fish stocks by 5% by 2025
- Reduce fishing capacity in degraded fisheries by 10% by 2025
- Reduce IUU fishing in the region by 20% by 2025

Objective 2:

Restore and maintain species composition

Targets

- Improve mean trophic level of the catch by 5% by 2025
- Increase the biomass of higher trophic level species (e.g. large demersals, tuna and sharks) by 5% by 2025

Fisheries and other marine living resources are restored and managed sustainably

Regional actions *Most of the transboundary and national actions contribute to all objectives for this theme.*

1A: Institutional arrangements, legal and policy reforms		Priority
1	Formulate a Regional Plan of Action on IUU fishing (RPOA-IUU).	High
2	Bi- and/or multi-national agreements to strengthen arrangements to determine and implement management measures to combat IUU at a regional level.	Medium
3	Harmonize legislative framework on endangered, threatened and protected (ETP) species, e.g. whale sharks and sea turtles.	Medium
4	Establish arrangements for better cooperation in the management of fish stocks shared between countries in the BOBLME region (such as Regional Fisheries Management Organizations/advisory bodies and technical committees); in particular for the conservation of biodiversity by establishing a regional network on ETP species and regional cooperation to address trade barrier issues.	Medium
5	Consultations with environmental and conservation groups (e.g. WWF, IUCN, CITES).	Low
6	Harmonize regulations and management measures (e.g. total allowable catch, mesh size) for transboundary species within the Bay of Bengal.	Low

1B: Management measures		
1	Develop and implement Regional Plans of Action (and National Plans of Action) on ETP species.	Medium
2	Strengthen existing Monitoring Control and Surveillance (MCS) systems and establish a MCS network in the Bay of Bengal.	Medium
3	Regional networking on monitoring of ETP species.	Medium
4	Address trade barriers, especially those on high value exported species, at a working regional level.	Low
5	Coordinate capacity development to: <ul style="list-style-type: none"> • provide incentives for sustainable fishing, in particular with respect to high trophic-level and ETP species; • reduce carbon dioxide emissions by promoting fuel efficiency practices at all steps in the fisheries production chain; • establish observer schemes; • track and investigate traded products. 	

Objective 3:

Reduce the proportion of juvenile fish caught and/or retained

Targets

- Reduce the percentage of juvenile fish caught by 10% by 2025
- Reduce the percentage of juveniles of commercially important fish caught by 25% by 2025
- Reduce unselective/destructive fishing by 20% (using a measure of fishing effort) by 2025
- Reduce fishing effort targeting juvenile fish by 20% by 2025

Objective 4:

Restore biodiversity status of 1980 by 2025

Targets

- Enhance species richness in selected ecosystems
- Eliminate the use of destructive fishing gear and practices by 2025, including in critical habitats
- Reduce incidental catch of vulnerable and endangered species by 50% by 2025

1C: Knowledge strengthening, awareness and communication		Priority
1	Deliver awareness programmes coordinated at the regional level.	High
2	Compile historical and baseline data and information at the regional (and national) level in accordance with the SAP's ecosystem health indicators.	High
3	Improve understanding of the movement of ETP species within and outside the region.	Medium
4	Conduct collaborative assessments of selected transboundary species.	Low
5	Improve access to and sharing of regional fisheries data and information.	Low
6	Coordinated capacity development to: <ul style="list-style-type: none"> • improve information on the fate of juvenile fish species landed, and their use in the market chain; • assess the economic loss caused by fisheries induced mortality of juvenile fish; • strengthen collection of data and information underpinning the SAP ecosystem indicators for ETP species, including incidental captures and fisheries interactions; • improve understanding of the movement, distribution and habitats of ETP species; • investigate the options relating to replacing aquaculture feeds that use wild caught juveniles with alternative protein sources. 	

1D: Human capacity development		
1	Deliver training on EAFM coordinated at the regional level.	High
2	Deliver training on data collection, analysis, management and exchange coordinated at the regional level.	Medium
3	Deliver training on science communication coordinated at the regional level.	Medium
4	Coordinated capacity development to: <ul style="list-style-type: none"> • develop expertise in stock enhancement; • develop research capacity in ecosystem modelling; • develop expertise in how to avoid the capture, and handle the release of, ETP species (e.g. for fishers); • develop expertise in ecosystem health and biodiversity indicators. 	

Fisheries and other marine living resources are restored and managed sustainably

National actions *Most of the transboundary and national actions contribute to all objectives for this theme.*

1A: Institutional arrangements, legal and policy reforms

- 1 Establish arrangements for better cooperation in the management of fish stocks within country (Fisheries Management/ Advisory body; management councils and technical committees), including interagency working groups on biodiversity.
- 2 Strengthen fisheries statistics bureaus and research institutes for improving fisheries data collection, analysis and reporting.
- 3 Incorporate the Code of Conduct for Responsible Fisheries (CCRF), including the ecosystem approach to fisheries management in national fisheries legislation; and address climate change issues in policies and management plans.
- 4 Formulate/strengthen legislation for licensing schemes.
- 5 Formulate/strengthen legislation to address IUU fishing (e.g. port state measures) and develop National Plans of Action on IUU .
- 6 Allocate adequate funds for fisheries management.
- 7 Involve fishers' organizations, research institutions in the policy formulation process.
- 8 Promote implementation of the UN Fish Stocks Agreement.
- 9 Review and update fisheries laws, and ensure that penalties are commensurate with the offenses.
- 10 De-centralize fisheries management.
- 11 Integrate coastal zone management and MPA approaches into policies for fisheries and ETP species.
- 12 Formulate/strengthen legislation on ETP species, including updating penalties for biodiversity destruction, and prohibiting the capture and consumption of ETP species.

1B: Management measures

- 1 Promote the implementation of EAFM and formulate/strengthen fisheries management plans.
- 2 Formulate/strengthen NPOAs on ETP species; including periodic revision and updates of ETP species listings.
- 3 Implement licensing of fishing vessels, traders and processing plants.
- 4 Include spatial approaches to fisheries management such as MPAs, no-take zones and seasonal and area closures.
- 5 Strengthen co-management for selected fisheries.
- 6 Formulate/strengthen gear regulations with respect to gear dimensions, mesh size and prohibition of destructive fishing practices.
- 7 Implement certification/ecolabeling (eco-friendly fisheries) and promote value addition for fisheries products.
- 8 Provide incentives for sustainable fishing, in particular with respect to high trophic-level and ETP species.
- 9 Reduce inappropriate subsidies provided to fishers.
- 10 Promote sustainable aquaculture ventures which do not use wild caught juvenile fish as feed.
- 11 Implement effective monitoring and evaluation of Fisheries Management Plans.
- 12 Promote the use of bycatch reduction devices.
- 13 Protect spawners (including spawning aggregations) and spawning grounds, particularly those of depleted, high trophic-level, and high value species.
- 14 Protect juveniles of depleted species, through the protection of nursery grounds and minimum legal size regulations.
- 15 Promote eco-tourism and non-consumptive use of biodiversity.
- 16 Establish captive breeding programmes for ETP species, where practical.
- 17 Reduce carbon dioxide emissions by promoting fuel efficiency practices at all steps in the fisheries production chain.
- 18 Establish observer schemes.
- 19 Create/strengthen fisheries compliance units, with possible inclusion of fishers' organizations.
- 20 Promote the use of a Vessel Monitoring System (VMS) in fisheries compliance.
- 21 Improve compliance by the use of market and trade mechanisms.
- 22 Improve compliance with international biodiversity-related conventions (e.g. CBD, CITES).
- 23 Establish systems for tracking and forensic investigation of traded products.

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A tick ✓ indicates that the countries are already undertaking the activity to some degree and intend to continue under the SAP; "new" indicates that it will be a new activity under the SAP; and a dash – indicates that a country will not pursue this activity as part of the NAP.

1C: Knowledge strengthening, awareness and communication

- 1 Develop and implement national awareness programmes on the management of marine living resources and responsible fisheries for a broad range of stakeholders.
- 2 Strengthen the collection of data and information underpinning the SAP ecosystem indicators such as fishing effort and fish landings, CPUE (including use of fishing log books), data on juvenile capture, gear selectivity and discards at sea.
- 3 Improve information on the impacts of climate change and options for climate change adaptation and mitigation.
- 4 Improve information on the fate of juvenile fish species landed, and their use in the market chain.
- 5 Assess the economic loss as a result of fishing induced mortality of juvenile fish.
- 6 Strengthen the collection of data and information underpinning the SAP ecosystem indicators for ETP species, including incidental captures and fisheries interactions.
- 7 Improve understanding of the status of species in the IUCN Red List.
- 8 Improve understanding of the movement, distribution and habitats of ETP species.
- 9 Investigate the options relating to replacing aquaculture feeds that use wild caught juveniles with alternative protein sources.

1D: Human capacity development

- 1 Develop and implement national educational programmes on the management of marine living resources and responsible fisheries for: policymakers and managers; fisheries departments; fisher organizations/co-operatives; government authorities; NGOs; local leaders/religious leaders; educational institutions and researchers; aquaculture establishments; and students at all levels.
- 2 Conduct training on EAFM.
- 3 Conduct training on data collection, analysis, management and exchange.
- 4 Conduct training on stock assessment.
- 5 Conduct training on research management.
- 6 Conduct training on stock enhancement.
- 7 Develop research capacity in ecosystem modelling.
- 8 Develop expertise in climate change adaptation and mitigation.
- 9 Develop capacity for fisheries management enforcement.
- 10 Develop expertise in ecosystem health and biodiversity indicators.
- 11 Develop skills in species identification (e.g. for researchers, fisheries officers and fishers).
- 12 Conduct training on how to avoid the capture and handle the release of captured ETP species (e.g. for fishers).
- 13 Develop expertise in trade issues and traceability for application in fisheries management.



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3.4.2 Critical habitats targets, regional and national actions

Theme 2: Critical habitats

Degraded, vulnerable and critical marine habitats are restored, conserved and maintained

Objective 1:

Protect, manage and restore mangrove habitats in order to increase mangrove coverage and improve biodiversity of mangrove habitats

Targets

Short-term

- 10% of lost mangrove area restored by the year 2025, with no net loss in restored area
- 10% of total mangrove area under conservation management (protected and managed) by year 2025
- 10% of the original diversity of mangroves restored by year 2025

Long-term

- 20–25% of lost mangrove area restored by 2050
- 50% of total mangrove area under conservation management by 2050
- >10% of the original diversity of mangroves restored by 2050

Degraded, vulnerable and critical marine habitats are restored, conserved and maintained
Regional actions *Most of the transboundary and national actions contribute to all objectives for this theme.*

2A: Institutional arrangements, legal and policy reforms		Priority
1	Establish a regional data and information sharing network on critical habitats and strengthen linkages between existing institutions (such as SACEP and ACB; and MFF, ICRI, Seagrass Watch, Seagrass Net, IOSEA (sea turtles), International Dugong Initiative).	Medium
2	Develop Regional MoU(s) or Plan(s) of Action for collaboration on the conservation of critical habitats.	Medium
3	Establish a Regional Advisory Council on critical habitats.	Medium
4	Form/strengthen a task force on each of the critical habitats to operate under the Regional Advisory Council. These may be established under existing regional bodies.	Low
5	Harmonize relevant coastal and marine environmental policies and guidelines on impact assessments for eco-tourism at the regional level.	Low
6	Coordinated capacity development to: <ul style="list-style-type: none"> • establish a national data and information sharing network on critical habitats and strengthen linkages between contributing institutions. 	
2B: Management measures		
1	Conduct regional assessments on critical habitat management effectiveness including ecosystem health of mangroves, coral reefs and seagrass.	High
2	Support joint regional/bilateral surveillance and enforcement mechanisms.	Medium
3	Coordinated capacity development to: <ul style="list-style-type: none"> • promote consistent use of coastal and marine environmental impact assessment methods 	

Objective 2:

Restore, protect and sustainably manage existing coral reef ecosystems, habitats and associated biodiversity, and prevent land and marine-based sources of pollution and destructive activities

Targets**Short-term**

- 5% of the existing area of coral reefs under an appropriate form of sustainable management and protection by 2025

Long-term

- 10% of the existing area of coral reefs under an appropriate form of sustainable management and protection by 2050

Objective 3:

Protect and manage seagrass habitats and associated biodiversity (in order to increase/maintain their extent and biodiversity)

Targets**Short-term**

- Area of seagrass under an appropriate form of sustainable management increased by 20% by 2025

Long-term

- By 2050, 15% of seagrass area under an appropriate form of sustainable management

2C: Knowledge strengthening, awareness and communication

1	Improve the knowledge base on critical habitats using standard monitoring guidelines at the regional level.	Medium
2	Improve access to and sharing of data and information on mangroves, coral reefs and seagrass with existing global and regional initiatives.	Medium
3	Deliver awareness programmes coordinated at the regional level.	Medium
4	Compile historical and baseline data and information at the regional (and national) level in accordance with the ecosystem health indicators for the SAP's critical marine habitats objectives.	Low
5	Coordinated capacity development to: <ul style="list-style-type: none"> • conduct economic valuations of the goods and services provided by mangroves, coral reefs and seagrass – including integrated economic and environmental modelling; • undertake dedicated surveys on critical habitats using visual methods, remote sensing and mapping tools; • estimate the carrying capacity of critical habitats, with emphasis on habitat connectivity and the possible impacts of climate change; • identify the point and non-point sources of pollutants reaching the coastal and marine environment and impacting critical habitats. 	

2D: Human capacity development

1	Deliver training on EAFM coordinated at the regional level.	Medium
2	Deliver training on Marine Protected Area management coordinated at the regional level.	Medium
3	Deliver training on specific critical habitat assessment and conservation coordinated at the regional level.	Medium
4	Coordinated capacity development to: <ul style="list-style-type: none"> • develop research capacity in ecosystem modelling; • develop expertise in habitat monitoring for research and regulatory agencies. 	

Degraded, vulnerable and critical marine habitats are restored, conserved and maintained

National actions *Most of the transboundary and national actions contribute to all objectives for this theme.*

2A: Institutional arrangements, legal and policy reforms

- 1 Establish/mandate an integrated institutional framework and coordination mechanism/institution for marine and coastal habitat management at the national and local levels; e.g. a national advisory council or a committee for ICM.
- 2 Establish a national data and information sharing network on critical habitats and strengthen linkages between contributing institutions.
- 3 Decentralize coastal habitat management.
- 4 Formulate/strengthen policy and legislation for the protection and restoration of critical habitats and for ICM, and mainstream into development policies.
- 5 Devolve decision-making powers for critical habitat management to the appropriate lowest level.
- 6 Provide the basis for local communities to have stewardship arrangements for sustainable use of critical habitats, including consideration of tenure and access to mangroves.
- 7 Improve government compliance with international obligations relating to critical habitats.
- 8 Evaluate national biodiversity strategies and action plans, and strengthen implementation.
- 9 Develop national action plans to address land- and sea-based sources of marine pollution, in particular excess nutrients.
- 10 Harmonize relevant coastal and marine environmental policies and guidelines for impact assessments on eco-tourism.
- 11 Develop policies to support good aquaculture practices in coastal areas.
- 12 Include the protection of seagrass in existing national legislation and policies.
- 13 Develop environmental policy guidelines for port and harbour developments and their operation.
- 14 Formulate/strengthen policies and regulations on coral and sand mining.
- 15 Review and update habitat protection laws, and ensure that penalties are commensurate with offenses.

2B: Management measures

- 1 Apply spatial planning/zoning in the management of critical habitats.
- 2 Conduct national assessments on critical habitat management effectiveness including ecosystem health of mangroves, coral reefs and seagrass.
- 3 Increase the number of MPAs and MPA networks (that include different habitat types to maintain functional connectivity) and improve management by implementing and monitoring MPA Management Plans.
- 4 Develop/strengthen National Plans of Action for critical habitats that promote conservation and sustainable use.
- 5 Establish stewardship arrangements within local communities to contribute to the management of mangroves, coral reefs and seagrass habitats.
- 6 Reduce the conversion of mangrove areas into aquaculture and other developments; and increase restoration efforts on degraded mangroves, including increasing the area under restoration.
- 7 Promote the use of effluent treatment facilities to manage unregulated discharge of pollutants from aquaculture and agriculture runoff.
- 8 Identify and implement best practices in eco-tourism.
- 9 Promote consistent use of coastal and marine environmental impact assessment methods.
- 10 Improve protection of ETP species associated with critical habitats.
- 11 Enforce the prohibition of destructive fishing practices such as the use of explosives and poisons; destructive fishing gears; and reduce adverse impacts by boats on critical habitats.
- 12 Allocate adequate funds for enforcement and compliance activities.
- 13 Improve collaboration and coordination between enforcement agencies.
- 14 Promote community stewardship arrangements and community-based management or co-management of critical habitat areas; including a possible role for community rangers.
- 15 Draft/strengthen enforcement manuals.
- 16 Strengthen and enforce regulations to prevent pollutants reaching coastal habitats.

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A tick ✓ indicates that the countries are already undertaking the activity to some degree and intend to continue under the SAP; "new" indicates that it will be a new activity under the SAP; and a dash – indicates that a country will not pursue this activity as part of the NAP.

Degraded, vulnerable and critical marine habitats are restored, conserved and maintained

National actions *Most of the transboundary and national actions contribute to all objectives for this theme.*

2C: Knowledge strengthening, awareness and communication

- 1 Develop and implement awareness programmes on the management of critical habitats for a broad range of stakeholders.
- 2 Ensure timely and effective dissemination of policies and regulations on critical habitats.
- 3 Compile historical and baseline data and information on critical habitats (including environmental and socio-economic aspects) in a form that can be used for management purposes and sharing.
- 4 Implement/strengthen programmes to monitor critical habitats and generate ecosystem health information.
- 5 Conduct economic valuations of the goods and services provided by mangroves, coral reefs and seagrass – including integrated economic and environmental modelling.
- 6 Assess the extent, distribution and status of critical habitats (including traditional management and habitat dependent livelihoods) and address information gaps through research.
- 7 Undertake dedicated surveys on critical habitats using visual methods, remote sensing and mapping tools.
- 8 Estimate the carrying capacity of critical habitats, habitat connectivity and the possible impacts of climate change.
- 9 Identify the point and non-point sources of pollutants reaching the coastal and marine environment and impacting critical habitats, in particular coral reefs.

2D: Human capacity development

- 1 Develop and implement educational programmes on the management of critical habitats for: policymakers and managers; fisheries and environmental departments; fisher organizations/co-operatives; government authorities; NGOs; local leaders and religious leaders; educational institutions and researchers; aquaculture establishments; and students at all levels.
- 2 Conduct training on MPA management and ecosystem management approaches in general.
- 3 Conduct training on habitat monitoring (e.g. use of visual survey techniques, remote sensing, mapping) for research and regulatory agencies.
- 4 Conduct training on mangrove restoration and nursery production for coastal communities and NGOs.
- 5 Develop expertise on the economic valuation and cost benefit analysis of critical habitats within research and government agencies.
- 6 Conduct training on alternative livelihood activities for coastal communities which depend on resources from critical habitats.
- 7 Conduct training on data collection, analysis, management and exchange.
- 8 Conduct training on research management.
- 9 Develop research capacity in ecosystem modelling.
- 10 Develop expertise in climate change adaptation and mitigation.
- 11 Develop capacity for enforcement operations in support of critical habitat management.

Bangladesh	India	Indonesia	Malaysia	Maldives	Myanmar	Sri Lanka	Thailand
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3.4.3 Water quality targets, regional and national actions

Theme 3: Water quality

Coastal and marine pollution and water quality are controlled to meet agreed standards

Objective 1:

Reduce or minimize the discharge of untreated sewage and waste water into river, coastal and marine waters

Targets

- 5% increase in the numbers of urban and coastal town connections to municipal or onsite sewage treatment systems by 2025
- 100% of effluent discharged from sewage treatment systems is treated to meet national waste water quality standards by 2025

Coastal and marine pollution and water quality are controlled to meet agreed standards

Regional actions *Most of the transboundary and national actions contribute to all objectives for this theme.*

3A: Institutional arrangements, legal and policy reforms		Priority
1	Review existing policies and legislation, identify gaps with a view to harmonizing national policies on pollution and water quality; and develop regional policy statements.	High
2	Support coordinated activities of existing regional bodies with a mandate in pollution and water quality.	Medium
3	Establish a regional advisory group on pollution and water quality e.g. a regular meeting of GPA focal points.	Medium
4	Establish a regional level multi-stakeholder platform in support of nutrient management.	Low
5	Strengthen regional cooperation to reduce the release of untreated sewage, marine litter and solid waste; and reduce nutrient discharge into the Bay of Bengal – in accordance with BOBLME SAP ecosystem health indicators and in collaboration with international programmes and partnerships.	Low
6	Coordinated capacity development to: <ul style="list-style-type: none"> • decentralize pollution and water quality management and empower local authorities to impose and collect levies/fees to be used for management. 	
3B: Management measures		
1	Implement regional protocols, guidelines, standards and indicators for managing pollution and water quality in accordance with BOBLME SAP ecosystem health indicators and in collaboration with international programmes and partnerships.	High
2	Formulate/strengthen regional oil spill contingency plans and emergency action plans.	Medium
3	Strengthen and support existing pollution and water quality initiatives and networks, with a view to facilitate sharing of enforcement information.	Medium
4	Coordinated capacity development to: <ul style="list-style-type: none"> • use nutrient modelling for management purposes; • establish zones for safe aquaculture and collection of shellfish for consumption. 	

for human and ecosystem health

Objective 2:

Reduce and minimize solid waste and marine litter in coastal and marine waters

Targets

- 5% reduction in solid waste disposal by 2025
- 5% reduction in plastics and e-waste by 2025
- Establishment of solid waste management systems in coastal regions
- Extended Producers Responsibility established for recyclable solid wastes
- 10% increase in municipal waste collection by 2025

Objective 3:

Reduce and control nutrient loading in coastal waters

Targets

- Improve nutrient use efficiency at the source in agriculture, aquaculture and other nutrient generating industries by 10% by 2025
- 50% reduction of nitrates and phosphates from waste waters by 2025
- 100% of sludge recovered and safely re-used by 2025

for human and ecosystem health

3C: Knowledge strengthening, awareness and communication

1	Compile historical and baseline data and information at the regional (and national) level in accordance with the ecosystem health indicators for the SAP's pollution and water quality objectives.	Medium
2	Improve the knowledge base on pollution and water quality using standard monitoring guidelines at regional level.	Medium
3	Deliver an awareness raising and communication campaign on pollution and water quality coordinated at the regional level.	Medium
4	Improve access to and sharing of data and information on pollution and water quality with existing global and regional initiatives.	Low
5	Coordinated capacity development to: <ul style="list-style-type: none"> • develop a spatial information system on the extent of land area under agriculture, aquaculture and animal husbandry in support of nutrient management; • develop a spatial information system on sewage networks; • develop a spatial information system on dump yards for solid waste; • develop models to predict the impacts of land use changes on pollution and water quality; • improve understanding of the ecological effects of nitrogen:phosphate ratios in sea water. 	

3D: Human capacity development

1	Deliver a capacity development programme on pollution and water quality management coordinated at the regional level.	High
2	Coordinated capacity development to: <ul style="list-style-type: none"> • develop expertise in ecosystem analysis and modelling. 	

Coastal and marine pollution and water quality are controlled to meet agreed standards for National actions *Most of the transboundary and national actions contribute to all objectives for this theme.*

3A: Institutional arrangements, legal and policy reforms

- 1 Review the mandates and identify the level appropriate (local, district, state and central authorities) for regulating matters of pollution and water quality; strengthen existing institutions (avoiding reliance on project-based bodies).
- 2 Strengthen the linkages between local, district, state and central authorities for regulating matters of pollution and water quality.
- 3 Strengthen coordination between the existing national institutions that have a mandate in pollution and/or water quality; e.g. the ministries of agriculture, industry, transport, trade, environment and fisheries.
- 4 Create an independent regulatory authority to lead, facilitate and coordinate on matters of pollution and water quality.
- 5 Improve and strengthen sewage treatment facilities.
- 6 Establish/strengthen nutrient testing facilities.
- 7 Review existing national policies and legislation on pollution and water quality; identify gaps and initiate processes with clear achievable timelines to fill the gaps.
- 8 Establish a pollution and water quality damage control fund.
- 9 Introduce the "Polluter Pays" principle to current legislation.
- 10 Introduce legislation for Public Interest Litigation.
- 11 Introduce legislation to ensure Right to Information.
- 12 Decentralize pollution and water quality management; and empower local authorities to impose and collect levies/fees to be used for management.
- 13 Introduce/strengthen incentives to recycle plastics and metals.
- 14 Formulate/strengthen nutrient management plans to reduce fertilizer use; e.g. promote organic farming and processing of livestock waste into fertilizer.
- 15 Formulate/strengthen a National Wastewater Act.

3B: Management measures

- 1 Set specific targets to reduce discharge of untreated sewage to rivers and seas; including, at least, primary treatment for all waste water.
- 2 Facilitate/strengthen participation of industry and environmental groups in decision-making on pollution and water quality at the national and local levels.
- 3 Facilitate the establishment of national-level, multi-stakeholder management advisory fora on pollution and water quality (including industry and environmental groups); in particular for nutrients, wastewater, solid waste and marine litter management.
- 4 Allocate adequate resources to address pollution and water quality management and enforcement.
- 5 Promote PPP (Public Private Partnerships) and CSR (Corporate Social Responsibility) approaches to pollution and water quality management.
- 6 Undertake regular beach cleaning to reduce solid waste and marine litter.
- 7 Review and improve the efficiency of current solid waste and marine litter collection and disposal activities, including waste reception facilities at ports and harbours.
- 8 Introduce/strengthen waste segregation and recycling at the household level.
- 9 Introduce incentives for the production and promotion of organic, clean-green and biodegradable approaches and products.
- 10 Develop/strengthen solid waste management plans.
- 11 Use nutrient modelling for management purposes.
- 12 Promote agriculture and aquaculture practices that minimize the release of nutrients into coastal environments.
- 13 Zone areas for safe aquaculture and collection of shellfish for consumption.
- 14 Promote protocols, guidelines and standards for managing pollution and water quality.
- 15 Promote land use practices that enhance soil conservation; including forestry practices that minimize loss of sediments to coastal environments.
- 16 Promote compliance with MARPOL regulations.
- 17 Develop/strengthen enforcement plans in support of pollution and water quality management.
- 18 Impose fines for non-compliance of sewage and organic load regulations at discharge points.
- 19 Establish a system and/or strengthen the competent body responsible for regulating the export of chilled seafood.
- 20 Promote self-regulation of pollution and water quality by industry, in particular with respect to heavy metals.
- 21 Strengthen and enforce regulations on point and non-point sources of all pollutants reaching coastal habitats.

human and ecosystem health

✓	✓	✓	✓	✓	new	new	✓
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✓	✓	✓	✓	new	✓	new	✓
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new	✓	✓	✓	new	✓	new	✓
✓	✓	✓	✓	new	✓	new	✓
✓	✓	✓	✓	✓	new	new	✓
✓	✓	✓	✓	✓	✓	new	✓
✓	✓	✓	✓	new	✓	new	✓
✓	✓	✓	✓	new	✓	new	✓

A tick ✓ indicates that the countries are already undertaking the activity to some degree and intend to continue under the SAP; "new" indicates that it will be a new activity under the SAP; and a dash – indicates that a country will not pursue this activity as part of the NAP.

Coastal and marine pollution and water quality are controlled to meet agreed standards for National actions *Most of the transboundary and national actions contribute to all objectives for this theme.*

3C: Knowledge strengthening, awareness and communication

- 1 Develop awareness programmes on pollution and water quality for all stakeholders.
- 2 Promote public awareness on selected pollution and water quality issues of national importance to build consensus and secure political/public commitments e.g. on nutrient over-enrichment of the coastal waters, and clean-green approaches.
- 3 Promote societal awareness on the cost of non-action with respect to addressing pollution and water quality issues.
- 4 Compile historical and baseline data and information on pollution and water quality (including environmental and socio-economic aspects) at the national level – in a format that can be used for management purposes and sharing.
- 5 Implement/strengthen a programme of monitoring on pollution and water quality to generate ecosystem health information; e.g. on the quantity, composition, segregation and disposal of solid waste; and point and non-point sources of pollutants.
- 6 Develop a spatial information system on sewage networks.
- 7 Develop a spatial information system on dump yards for solid waste.
- 8 Improve understanding of the environmental impacts of landfills and incineration on the coastal environment.
- 9 Develop a spatial information system on the extent of land area under agriculture, aquaculture and animal husbandry in support of nutrient management.
- 10 Develop models to predict the impacts of land use changes on pollution and water quality.
- 11 Improve understanding of the ecological effects of nitrogen:phosphate ratios in seawater.
- 12 Improve understanding of biogeochemical processes related to pollution and water quality.

3D: Human capacity development

- 1 Develop education programmes on pollution and water quality; e.g. on solid waste and nutrient management.
- 2 Conduct training on environmental impact assessment.
- 3 Develop capacity in appropriate land use techniques.
- 4 Develop expertise in ecosystem analysis and modelling.



human and ecosystem health

Bangladesh	India	Indonesia	Malaysia	Maldives	Myanmar	Sri Lanka	Thailand
✓	✓	✓	✓	new	✓	new	✓
✓	✓	✓	✓	new	✓	new	✓
new	✓	✓	✓	new	✓	new	✓
✓	✓	✓	✓	✓	new	new	✓
✓	✓	✓	✓	✓	new	new	✓
new	✓	✓	✓	new	new	new	✓
new	✓	✓	✓	new	new	new	✓
✓	✓	✓	✓	new	new	new	✓
✓	✓	✓	new	new	new	new	✓
new	✓	✓	✓	new	new	new	new
new	✓	✓	✓	new	new	new	✓
✓	✓	✓	✓	new	new	new	✓
✓	✓	✓	✓	✓	new	new	✓
✓	✓	✓	✓	new	✓	new	new
new	✓	✓	✓	new	✓	new	new



3.4.4 Social and economic targets, regional and national actions

Theme 4: Social and economic considerations

Social and economic constraints are addressed, leading to increased resilience and empowerment

Objective 1:

Reduce vulnerability to natural hazards, climate variability and climate change, and increase climate resilience

Targets

- Coastal communities in at least 30% of national coastlines (considered equivalent to 30% of coastal population) involved in climate change adaptation or risk reduction programmes by 2025
- Climate change adaptation information disseminated to communities of another 20% of coastlines (considered equivalent to 20% of coastal population) by 2025
- All Sub-regional and Regional Management Plans and arrangements have included Disaster Risk Management (DRM) and Climate Change Adaptation (CCA) by 2020

Objective 2:

Improve the living and working conditions of coastal fishing communities

Targets

- Coastal communities in at least 30% of national coastlines (considered equivalent to 30% of coastal population) involved in programmes relating to improving living and working conditions by 2025
- Information on improving living and working conditions disseminated to communities and identified vulnerable groups of another 20% of coastlines (considered equivalent to 20% of coastal population) by 2025
- Human Development Index and perception survey results indicate improvements in the majority of survey components by 2025

Social and economic constraints are addressed, leading to increased resilience and empowerment
Regional actions *Most of the transboundary and national actions contribute to all objectives for this theme.*

4A: Institutional arrangements, legal and policy reforms	Priority
1 Review fisheries, aquaculture and coastal development related legal and policy frameworks and arrangements and amend to include DRM and CCA content; and similarly, review DRM and CCA policies, strategies and arrangements and amend to include fisheries, aquaculture and coastal issues.	High
2 Establish/strengthen arrangements for regional cooperation on CCA and resilience.	High
3 Analyse and promote the inclusion of coastal fisheries and aquaculture in poverty reduction and development policies, strategies and plans.	High
4 Create, support and promote an enabling environment to support empowerment of coastal people, e.g. by promoting institutional coordination and collaboration.	High
5 Support the participatory development of regional, sub-regional and national plans of action to implement the SSF Guidelines and related instruments.	High
6 Promote the inclusion of the SSF Guidelines in relevant regional policies, strategies and frameworks.	High
7 Climate and hazard proof regional strategies, management plans and arrangements by incorporating information such as uncertainty, species distribution shifts and changes, human migration.	Medium
8 Undertake a gender equity review and gaps analysis of policies, regulatory and legal frameworks and institutions; and provide recommendations for best practice and initiate actions for mainstreaming.	Medium
9 Establish or strengthen initiatives that support safer livelihoods through decent employment in fisheries and aquaculture.	Medium

of coastal people

Objective 3:

Empower coastal people to participate in and benefit from sustainable development practices

Targets

- Significant improvements in gender equity in legislation, policy frameworks by 2025
- Central and key decentralized fisheries offices have small-scale fisheries focal units
- At least 50% of participants in key focus group discussions, awareness seminars and survey respondents, indicate knowledge and understanding of key elements of the Voluntary Guidelines for securing sustainable small-scale fisheries in the context of food security and poverty eradication (SSF Guidelines)
- Key elements of SSF Guidelines incorporated into national policy instruments and strategies
- Small-scale fisher and fish farmer organizations participate effectively in consultative and decision-making processes

of coastal people

4B: Management measures	Priority
1 Identify and prioritize elements of the SSF Guidelines for implementation; propose relevant strategies, taking into account the diversity of small-scale fisheries.	High
2 Ensure gender sensitivity of SAP actions.	Medium
3 Provide regionally coordinated support to national programmes on integrated and adaptive management.	Medium
4 Provide regionally coordinated support to national programmes on reducing risks associated with fishing and fish farming in a changing climate.	Low
5 Deliver a regionally coordinated programme to promote access to financial services and insurance mechanisms.	Low
6 Coordinated capacity development to: <ul style="list-style-type: none"> • undertake vulnerability assessments at different scales to identify risks and opportunities for coastal fishing communities to achieve their development objectives; • promote and support energy efficiency in fisheries. 	

4C: Knowledge strengthening, awareness and communication		Priority
1	Deliver a regionally coordinated awareness programme on CCA and resilience	High
2	Identify regional hotspots and undertake vulnerability mapping of regional food, nutrition and livelihood security, and regional management arrangements	High
3	Monitor and analyse the contributions of fisheries-based activities in coastal communities to food and nutrition security, livelihoods security and economic growth	High
4	Implement a regionally coordinated programme to disseminate information on the SSF Guidelines and related instruments, and support development of a regional plan of action	High
5	Support decision-making by linking information from climate and bioclimate models	Medium
6	Promote the role of small-scale fisheries in efforts related to CCA and DRM and support energy and natural resource efficiency in the subsector, including the entire value chain – fishing and fish farming, post-harvest, marketing and distribution	Medium
7	Promote regional exchange on best practices in safety-at-sea programmes and other CCA and DRM practices	Medium
8	Raise awareness of the need for safer livelihoods through decent employment in fisheries and aquaculture	Medium
9	Establish and maintain regional information exchange on identification and implementation of alternative income generating livelihood activities	Low
10	Undertake regional research on the access of coastal communities to social services (e.g. health, education, social protection) and promote the exchange of good practices	Low
11	Coordinated capacity development to: <ul style="list-style-type: none"> support decision-making at national and local scales by linking climate and bioclimate models, including use of coastal communities' perceptions and knowledge. 	
4D: Human capacity development		Priority
1	Deliver a regionally coordinated capacity development programme on natural hazards, climate change and climate variability implications, vulnerabilities and adaptation planning for fisheries and coastal communities.	High
2	Deliver a regionally coordinated capacity development programme to improve safety at sea and other CCA and DRM practices.	High
3	Deliver a regionally coordinated capacity development programme to diversify livelihoods and production systems, and promote alternative income generating opportunities.	High
4	Deliver a regionally coordinated programme to enhance the capacity of small-scale fishing communities and their organizations that will enable them to participate in decision-making processes on aquatic resources conservation and management and in other relevant processes which affect their livelihoods.	High
5	Deliver a regionally coordinated programme to develop capacity of key change agents and stakeholders to implement the SSF Guidelines.	Medium
6	Deliver a regionally coordinated capacity development programme on financial services options (credit, savings, insurance) in support of livelihoods diversification and resilience.	Medium
7	Deliver a regionally coordinated programme to strengthen the capacity of producer organizations and other service providers to offer enhanced services on entrepreneurship skills for SME, livelihood diversification, decent employment in fisheries and ancillary services and social services.	Low



Institutional arrangements, legal and policy reforms

National actions *Most of the transboundary and national actions contribute to all objectives for this theme.*

4A: Institutional arrangements, legal and policy reforms

- 1 Support the inclusion of the fisheries sector in national CCA and DRM policies and strategies and vice-versa.
- 2 Implement legal and policy reforms in support of increasing access of small-scale fishers and fish farmers to financial services such as credit, savings and insurance.
- 3 Decentralize coastal habitat management.
- 4 Create national focal points (with a supportive legal basis) for decent employment in fisheries (in support of the implementation of FAO-ILO guidance on addressing child labour in fisheries and aquaculture, and good labour practices).
- 5 Facilitate the establishment of coordination mechanisms between the departments/ministries of labour, social services and fisheries in support of decent employment and livelihoods in fisheries and aquaculture.
- 6 Create gender focal points in all relevant agencies/institutions.
- 7 Undertake a gender sensitive review of legislation and regulatory frameworks.
- 8 Support the establishment of fisherfolk organizations and fisheries management advisory councils.
- 9 Promote the establishment of multi-sectoral platforms for the implementation of the SSF Guidelines.
- 10 Promote the inclusion of the SSF Guidelines in relevant national policies, strategies and frameworks.

4B: Management measures

- 1 Undertake vulnerability assessments at different scales to identify risks and opportunities for coastal fishing communities to achieve their development objectives.
- 2 Promote and support strengthening of integrated, participatory and adaptive management of the fisheries sector.
- 3 Promote and support energy efficiency in fisheries, including the entire value chain – fishing and fish farming, post-harvest, marketing and distribution.
- 4 Develop and implement local and national plans to improve living and working conditions of coastal fishing communities.
- 5 Identify and support the implementation of alternative income generating livelihood support activities for women, men and youth.
- 6 Identify and promote access to financial and business advisory services, and insurance mechanisms.
- 7 Provide support to producer organizations to strengthen the level of self-organization of coastal communities that will enhance services and participation in decision making.
- 8 Implement the SSF Guidelines, promoting in particular co-management and representative advisory committees.

4C: Knowledge strengthening, awareness and communication

- 1 Increase awareness on CCA, DRM and resilience through appropriate communication media and processes.
- 2 Support decision-making at national and local scales by linking climate and bioclimate models, including use of coastal communities' perceptions and knowledge.
- 3 Undertake social and economic impact assessments of management measures on coastal communities, including use of living and working conditions surveys.
- 4 Implement awareness programmes on decent employment in fisheries including good labour practices (e.g. implementation of the FAO-ILO guidance documents).
- 5 Collect and analyse socio-economic monitoring (SocMon) information.
- 6 Disseminate information on the SSF Guidelines and related instruments and support consultations to develop national plans of action for implementation.

4D: Human capacity development

- 1 Train fisherfolk and fish workers on safety-at-sea and other CCA and DRM practices.
- 2 Develop capacity to diversify livelihoods and production systems, and promote alternative income generating opportunities.
- 3 Develop capacity of SME in business management of fisheries and ancillary services.
- 4 Strengthen the capacities of organizations and workers, employers, producers and relevant government institutions to promote decent rural employment and living conditions in the fisheries sector.
- 5 Develop capacity to collect and monitor socio-economic information.
- 6 Develop capacity of key change agents and stakeholders to implement the SSF Guidelines.
- 7 Enhance the capacity of small-scale fishing communities and their organizations that will enable them to participate in decision-making processes on aquatic resources conservation and management and in other relevant processes which affect their livelihoods.

Bangladesh	India	Indonesia	Malaysia	Maldives	Myanmar	Sri Lanka	Thailand
✓	✓	–	✓	new	new	✓	✓
new	–	✓	✓	✓	✓	✓	✓
✓	–	✓	new	new	✓	–	✓
✓	✓	–	new	new	✓	new	✓
✓	✓	✓	✓	✓	✓	new	✓
✓	✓	–	–	✓	✓	new	–
new	–	–	–	✓	–	new	–
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A tick ✓ indicates that the countries are already undertaking the activity to some degree and intend to continue under the SAP; "new" indicates that it will be a new activity under the SAP; and a dash – indicates that a country will not pursue this activity as part of the NAP.

3.5 SAP Implementation

3.5.1 Cooperation and coordination mechanism

The BOBLME countries acknowledge that solving transboundary environmental and fisheries problems requires a regional mechanism to facilitate inter-country discourse on planning, implementation, monitoring, evaluation and reporting on sustainable development as a whole.

At the national level, despite a plethora of policies, laws, rules and regulations in many sectors, the outstanding problem is one of non-compliance, owing to inadequacies in governance – defined by the United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP) as "the process of decision-making and the process by which decisions are implemented (or not implemented)".

Successful implementation of the SAP will require improvements in the following areas of governance:

- Increased political priority given to the management of marine living resources, critical habitats, pollution, water quality and social and economic factors.
- More effective enforcement of laws and regulations.
- Increased stability in policies and priorities.
- Stronger coordination between fisheries and environment agencies, including research organizations.
- Increased transparency and accountability.
- Stronger coordination between enforcement agencies.
- Integrated planning across different levels of governance – central, state (provincial) and local government.
- Improved local stakeholder participation in planning, decision-making, implementation and monitoring.
- Increased budgetary commitments for implementation and enforcement of legislation.
- Increased compliance with rules and regulations.

Consortium for the Conservation and Restoration of the BOBLME

There are many regional bodies, organizations and partnerships – with a range of mandates and competencies – working towards similar environmental goals in the Bay of Bengal. Therefore there is considerable potential for them to collectively provide momentum and synergy for SAP implementation at the national, sub-regional and regional levels. The BOBLME Project worked with more than 20 institutions, bodies and agencies during its first phase. This has contributed to improved understanding of resource and habitat status and related management activities in the Bay of Bengal; fostered collaborative action and exchange of information; reduced duplication of work; and promoted the optimal use of funding and other resources.

The SAP comprises a broad range of activities relating to a diverse spectrum of topics and sectoral interests that span a wide geographical area. At present, there is no single body or environmental convention that has a complete mandate to cover all aspects of the SAP across its entire geographical range.

In 2013, the BOBLME Project Steering Committee endorsed an institutional arrangement for SAP implementation which would consist of a consortium of countries and major partners and donors working in the areas of fisheries, environment, water quality and their social and economic dimensions. This is envisaged as an intermediate arrangement, while the possibility of a permanent arrangement will be explored during the SAP implementation phase.

This "Consortium for the Conservation and Restoration of the BOBLME" (CCR-BOBLME) will meet regularly (at least annually) to:

- promote information exchange and capacity development
- monitor BOBLME health and status
- monitor progress of the SAP implementation activities and projects

While the membership of the Consortium and the exact nature and extent of the activities of the Consortium members are yet to be defined, the following entities, bodies and organizations have agreed, in principle, to join the CCR-BOBLME and play a role in SAP implementation. This list is by no means complete and additional members are expected to join in the future.

**BOBLME countries
will need to integrate
SAP actions into their
national work plans**

SAP partners	Likely areas of contribution
Asian Development Bank (ADB)	Infrastructure development, livelihoods
Asia-Pacific Fishery Commission (APFIC)	Fisheries policy forum
Association of South East Asian Nations (ASEAN)	Policy and technical input
Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)	Technical cooperation
Bay of Bengal Programme – Intergovernmental Organization (BOBP-IGO)	Fisheries, safety at sea
Fauna and Flora International (FFI)	Biodiversity conservation
Food and Agriculture Organization (FAO)	Fisheries and aquaculture
Government of Norway	Sustainable development, human rights-based approach
Government of Sweden	Sustainable development, human rights-based approach
Indian Ocean Global Ocean Observing System (IOGOOS)	Large scale processes, climate change
Indian Ocean Tuna Commission (IOTC)	Fisheries
Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO-IOC)	Large-scale processes, climate change
International Collective in Support of Fishworkers (ICSF)	Small-scale fisheries, human rights-based approach
International Union for the Conservation of Nature (IUCN)	Environment, ICM, MPAs, biodiversity
International Labour Organization (ILO)	Decent work conditions
Network of Aquaculture Centres in Asia and Pacific (NACA)	Aquaculture
National Oceanic and Atmospheric Administration (NOAA) of the United States	Large-scale processes, climate change, EAFM
Partnerships in Environmental Management for the Seas of East Asia (PEMSEA)	Sustainable development, ICM
South Asia Association for Regional Cooperation (SAARC)	Policy and technical input
South Asia Cooperative Environment Programme (SACEP)	Environment, biodiversity
Southeast Asian Fisheries Development Center (SEAFDEC)	Fisheries, training
United Nations Environment Programme (UNEP)	Environment, marine spatial planning, land-based pollution, nutrient management, biodiversity
United Nations Development Programme (UNDP)	Sustainable development interventions
World Bank (WB)	Infrastructure development
WorldFish	Fisheries, research

SAP implementation will proceed through several streams of work, consisting of national work plans that include the national activities listed in the SAP document, work being undertaken by partners operating in the region, and a regional programme of work that will focus on:

- implementing activities relating to the regional actions listed in the SAP
- supporting or augmenting a range of existing country and partner activities
- supporting partner capacity development
- actively promoting the development of additional initiatives and projects in support of the SAP implementation
- coordinating and monitoring SAP implementation
- creating, fostering, coordinating and strengthening partnerships

The regional programme of work is envisaged to be a donor funded project that would operate for at least seven years, but probably require a time horizon of 10–12 years. A Project Steering Committee will be established to manage and set policy for the programme. The PSC will comprise two members nominated by each country, one person from the Ministry of Fisheries and one person from the Ministry of Environment (or equivalent government agencies). These representatives will be expected to support national actions and promote linkages between marine-related government agencies and other stakeholders, aside from providing guidance to the regional programme of work. A SAP Coordination Unit will provide project coordination and monitoring services, similar to the role played by the BOBLME Project Regional Coordination Unit. It will support both the PSC and the CCR-BOBLME.

3.5.2 Projected SAP implementation costs and benefits

The BOBLME Project has undertaken a first ever regional assessment of the economic value of marine and coastal ecosystem services in the BOBLME. This allows for preliminary estimates to be made of the potential economic gains and costs avoided if the SAP is implemented and the degradation and over-exploitation of the region's natural resources and habitats is halted.

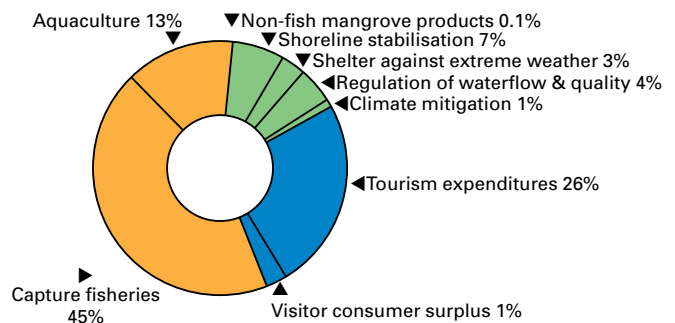
The BOBLME countries are currently investing hundreds of millions of dollars per year on actions related to sustaining and managing the marine environment and fisheries resources of the Bay of Bengal. The combined total being allocated to fisheries alone by BOBLME countries is currently more than USD230 million per year.

The BOBLME Strategic Action Programme will improve the outcomes of these investments by strengthening the application of current environment and resource management practices in BOBLME countries and halting the ongoing decline in ecosystem health.

Marine and coastal ecosystem services in the BOBLME are estimated to be worth over USD72 billion a year.

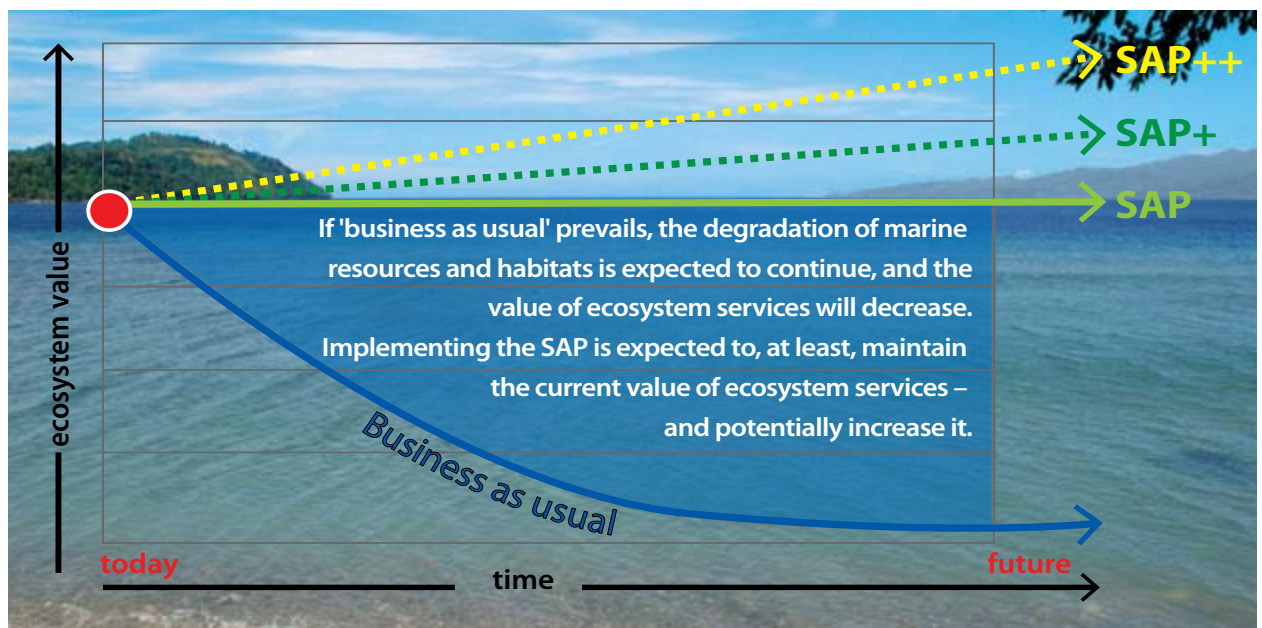
Fisheries – USD32.4 billion
Aquaculture – USD9.4 billion
Tourism – USD18.7 billion

USD72.3 billion – the estimated value of marine and coastal ecosystem services in 2014



Marine and coastal ecosystem services in the BOBLME are conservatively estimated to be worth over USD72 billion a year, with direct income generated in the capture fisheries, aquaculture and tourism sectors accounting for around USD32.4 billion, USD9.4 billion and USD18.7 billion of this total, respectively. The remaining value of about USD24 billion includes non-commercial and non-use values such as protection against extreme weather events, shoreline stabilization, regulation of waterflow and quality and climate change mitigation, as well as multiplier effects across the economy via impacts on other sectors and industries.

In the next 25 years the coastal populations of the BOBLME are expected to increase by almost a quarter. Under a “business as usual” scenario (i.e. not implementing the SAP), it is inevitable that this will result in increased pressure on the environment and its resources, and cause a marked decrease in the value of ecosystem services as the ecosystem and its services, on the whole, become progressively degraded.



Fisheries in particular, will come under increasing pressure as the critical habitats for fish are lost and degraded and fishing effort continues to increase. The future value of fisheries in the Bay of Bengal has not yet been determined. However, the current benchmark value of USD32.5 billion, based on catch trends and assumptions regarding sustainable limits, must be sustained through implementation of actions proposed in the BOBLME SAP related to habitat conservation, pollution reduction and fishery reforms.

Halting the degradation of marine and coastal environments and maintenance of existing ecosystem services through the implementation of the SAP will generate economic values worth more than USD1 350 billion from BOBLME resources and habitats over the next 25 years. Conversely, under a business as usual (BAU) scenario of continued ecosystem degradation and loss, economic values will decrease to around USD1 110 billion.

Thus, implementing the SAP and only halting the current level of damage being inflicted on the environment will secure ecosystem services worth about USD240 billion over the next 25 years – a figure which will be considerably higher should the SAP also serve to improve or further enhance the status and productivity of marine and coastal environments (refer to the SAP+ and SAP++ scenarios in the figure on the previous page).

This comparison of marine and coastal ecosystem values under BAU and SAP scenarios underlines the high economic costs and losses which will be incurred by failing to take action to halt marine and coastal biodiversity loss and ecosystem degradation in the BOBLME. These costs and damages would accrue across many different sectors, including: fisheries, tourism, water, energy, settlement and infrastructure, food security, disaster risk reduction and climate change adaptation.

The value-added and costs avoided by implementing the SAP are substantial for local, national and even international economies, and are realized even under the very conservative or minimal scenario i.e. that the SAP will serve only to halt any further degradation of natural habitats and fisheries.

The incremental cost to implement the first seven years of the Bay of Bengal SAP is around USD48 million. It is expected that this will be delivered within a BOBLME Programme comprising at least five projects that are based on the regional and national actions from one or more of the SAP themes. The five projects currently envisaged are:

1. Sustainable management of fisheries (SAP themes 1 and 4) Demonstrating positive changes in the sustainability of fisheries and livelihoods dependent on marine living resources.	USD10 million
2. Restoration and conservation of critical marine habitats (SAP themes 2 and 4) Strengthening the management and status of degraded, vulnerable and critical habitats and endangered, threatened and protected species.	USD13 million
3. The creation of enabling environments for management in critical transboundary areas (SAP themes 2 and 4) Improving the information base and developing functional networks to support the conservation and management of the critical transboundary areas.	USD 4 million
4. Management of marine pollution to improve ecosystem health in the Bay of Bengal (SAP themes 3 and 4) Positive changes to the status of ecosystem health through improved management of coastal and marine pollution.	USD15 million
5. Strengthening institutional capacity for the management of the Bay of Bengal Large Marine Ecosystem (SAP themes 1, 2, 3 and 4) Strengthening capacity to implement ecosystem management, including the development of a sustainable regional consortium to monitor and advise on the health and status of the BOBLME.	USD 6 million

The BOBLME countries are currently investing substantial financial resources on management and research in the marine environment and fisheries in the Bay of Bengal. It is recognised that these current, ongoing and planned programmes of the BOBLME countries represent a significant contribution to the resources required for SAP implementation, while additional resourcing can be explored through multi-lateral and bilateral arrangements.

An increased level of sustainability in the implementation of SAP activities and a consequent reduction in donor dependence is expected to be achieved as countries and Consortium partners incorporate more SAP activities into their national and agency work plans over the next five to 10 years.

Investing in the SAP and achieving its objectives will help safeguard ecosystem services worth around USD240 billion over the next 25 years – services that will be lost if action is not taken to halt current rates of marine and coastal ecosystem degradation and biodiversity loss

3.5.3 Application of best practices in resource management

Implementation of the SAP will involve the application of best practices, including:

Ecosystem approach to fisheries management (EAFM): EAFM is a practical way to apply sustainable development principles to the management of fisheries and achieve a balance between ecological and social well-being. The purpose of the EAFM process is to develop and implement an integrated set of management arrangements so that a fishery may generate more acceptable, sustainable and beneficial community outcomes. The BOBLME Project played a major role in the development of a training course on EAFM which will be rolled out as part of SAP implementation. Adopting an ecosystem approach also includes the promotion and implementation of the small-scale fisheries guidelines.

Integrated coastal management (ICM): ICM is an integrated approach to the management of coastal areas that takes into account the requirements of all stakeholders in the coastal zone in an attempt to achieve sustainability. There is a strong need for qualified coastal managers and policy makers with the knowledge, tools and skills to design and implement sustainable ICM programmes for countries in the BOBLME region. To meet this need, the BOBLME Project partnered with MFF and the AIT and PEMSEA to train ICM practitioners and this capacity development is expected to continue during SAP implementation.

Spatial management regimes: in addition to target stock management, successful fisheries management requires a holistic approach that includes biodiversity conservation and protection of habitats. The FAO Technical Guidelines for Responsible Fisheries on Marine Protected Areas (MPAs) and Fisheries describe how fisheries management and biodiversity conservation are linked and what the opportunities and challenges of implementing MPAs are. Increased awareness of the essential role that ecosystems and biodiversity in areas beyond national jurisdiction and deep-sea zones play in overall ecosystem functioning, has resulted in an international effort to describe areas of the ocean of particular ecological or biological significance – so called EBSAs (Ecologically or Biologically Significant Marine Areas). At present, EBSAs are not being considered, as such, in any spatial management regimes but the identification of such areas to management bodies (to decide what, if anything, needs to be done with them) is expected in the future. While an EBSA may not be under threat from human impact, Vulnerable Marine Ecosystems (VMEs) are being identified on the basis of their vulnerability to fishing related activities. Given this, the threats to VMEs are expected to be addressed by fisheries management bodies.

Marine spatial planning (MSP): MSP is a public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives. It may be ecosystem-based, area-based, integrated, adaptive, strategic and participatory. Marine spatial planning is not an end in itself, but a practical way to create and establish a more rational use of marine space and the interactions between these uses. It is a means of planning that strives to balance demands for development with the need to protect the environment, and achieve social and economic objectives in an open and deliberate way.

Human rights-based approach: the application of human rights principles (e.g. such as those found in the Voluntary Guidelines for Securing Small Scale Fisheries) in programmes related to sustainable development is highly appropriate. Governments have obligations to respect, fulfil and protect the rights of their populations. All men, women, girls and boys are entitled, without fear of discrimination, to equal access to ecosystem services and natural resources and a standard of living adequate for their health and well-being. Everyone has a right to freely participate in decision-making that affects them and their environment. People in power have an obligation to offer meaningful participation and consultation with interested and affected people. Everyone has the right to organize and hold opinions without any interference and to seek, receive and impart information and ideas. All people have the right to obtain information in an accessible and timely manner.

3.5.4 Risks

The risks to the successful implementation of the SAP fall into two broad categories: risks to project management (internal) and risks relating to the project context or political environment (external).

Internal risks:

- The SAP is not implemented in accordance with donor/funding agencies' requirements.
- The SAP implementation mechanism is ineffective and inefficient (not well resourced, and technically and administratively not sufficiently competent) to implement the SAP.
- The financial sustainability of the SAP implementation mechanism is not assured.
- There is ineffective governance and supervision of SAP implementation.
- The institutional coordination of SAP implementation partnerships is ineffective or insufficient.
- Countries provide insufficient staff, funding and resources to effectively implement the SAP through bi-national or regional efforts.

- Countries demonstrate insufficient political will to effectively participate in SAP implementation.
- Countries fall short in maintaining consensus to collaboratively implement the SAP.
- Countries consider regional (ecosystem health) standards to involve unacceptable obligations beyond existing national programmes and standards.

Internal risks will be monitored and addressed when necessary by the PSC, supported by the SAP Coordination Unit.

External risks:

- Climate change impacts exceed the adaptive capacities of countries.
- Natural disasters and required responses overwhelm a country's capacity to cope.
- Changes in the security conditions of participating countries affect SAP implementation.
- Political changes move countries to give priority to national actions rather than collaborative approaches in regional SAP implementation.
- Pressing domestic economic and social issues prevent senior national political decision-makers from realizing the long-term need to sustainably manage the living marine resources and environment of the BOBLME.
- National political leaders do not see the benefits of regional coordination in the effort to sustainably manage the BOBLME and thus will not commit necessary time and resources to SAP implementation.
- Countries decide that regionally-based institutional arrangements for SAP implementation are inconsistent with their national interests.

External risks pertaining to climate change, natural disasters, security conditions, political changes and economic conditions will be monitored using available public information sources. Any political developments that lead away from an emphasis on joint regional action towards a unilateral and national focus of actions shall be monitored and mitigated, or influenced as far as possible through effective communication and the generation of high-level political support.



3.5.5 Monitoring implementation and evaluating impacts

Monitoring and evaluation

Effective monitoring and evaluation (M&E) is recognized as an indispensable tool in project and programme management, and M&E is one of the key functions of the SAP Coordination Unit. The SAP Implementation Project will also adopt the indicators framework proposed by the International Waters Task Force, which consists of three types of indicators: (i) process indicators; (ii) stress reduction indicators; and (iii) environmental status indicators. Most interventions or transboundary and national actions undertaken in the areas of institutional arrangements, legal and policy reforms, knowledge strengthening, awareness and communication, and human capacity development, will lead to results and contribute to objectives for which process indicators will be applied. The implementation of management measures, however, is expected to contribute directly to environmental stress reduction and status improvement, which will be measured through the application of ecosystem indicators.

Ecosystem indicators

Indicators developed for the EcoQOs and for the 13 specific objectives can make use, as far as possible, of the LME assessment methodology developed under the UNEP-GEF project "Development of the Methodology and Arrangements for the GEF Transboundary Waters Assessment Programme (TWAP)". TWAP uses a conceptual framework that shows the links between human vulnerability and natural and anthropogenic stressors, ecosystem services and the consequences for humans and governance of LMEs.

Data sources for LME indicators

In a global context – but applicable to the BOBLME – the Intergovernmental Oceanographic Commission of UNESCO (UNESCO-IOC), which is leading the assessments of LMEs, has proposed that data on LMEs be acquired through existing databases maintained by a range of institutions including NOAA (remote sensing data on primary productivity); the University of Rhode Island (data on sea surface temperature); the University of California at Santa Barbara (mapping of cumulative human impacts in LMEs); CERMES (University of the West Indies in Barbados) and Dalhousie University (governance assessment); FAO and the University of British Columbia, Canada (fisheries data); UNEP/GRID-Arendal and UNEP-WCMC (marine habitat data); IGBP (modelling of nutrient inputs using the global NEWS model); IGBP, LOICZ and others (deltas at risk index); GCRMN, the global coral reef monitoring network; GESAMP (marine pollution); and the University of Miami (socio-economics), among others. Publicly available data will be obtained from these partner institutions, as well as from regional and national sources.





Selected references

- BOBLME. 2012. Transboundary Diagnostic Analysis Vol. 1. Issues, proximate and root causes. Bay of Bengal Large Marine Ecosystem Project. Phuket, Thailand. 48 pp.
- BOBLME. 2012. Transboundary Diagnostic Analysis Vol. 2. Background and environmental assessment. Bay of Bengal Large Marine Ecosystem Project. Phuket, Thailand. 108 pp.
- BOBLME. 2012. Report of the SAP Process Development Workshop. Phuket, Thailand, 15–17 February 2012. BOBLME-2012-Project-03. 33 pp.
- BOBLME. 2012. Fisheries, marine environment and integrated coastal management policy processes, content and implementation in the BOBLME countries. BOBLME-2012-Governance-03. 300 pp.
- BOBLME. 2012. Report of the Technical Workshop on Developing an Action Plan on the Overexploitation of Marine Living Resources. Phuket, Thailand, 30–31 May 2012. BOBLME-2012-Project-08.
- BOBLME. 2012. Report of the Technical Workshop on Developing an Action Plan on the Degradation of Critical Habitats. Phuket, Thailand, 4–5 June 2012. BOBLME-2012-Project-09.
- BOBLME. 2012. Report of the Technical Workshop on Developing an Action Plan on Pollution and Water Quality. Phuket, Thailand, 6–7 June 2012. BOBLME-2012-Project-10.
- BOBLME. 2014. Report of the BOBLME SAP finalisation meeting. Bangkok, Thailand, 21–22 October 2014. BOBLME-2014-Project-04. 9 pp.
- BOBLME. 2014. Assessing, demonstrating and capturing the economic value of marine and coastal ecosystem services in the Bay of Bengal Large Marine Ecosystem. BOBLME-2014-SOCIO-EC-02. 70 pp.
- Brugere, C. 2014. Mainstreaming gender in transboundary natural resources projects – the experience of the Bay of Bengal Large Marine Ecosystem (BOBLME) project. *Environmental Development* 11: 84–97.
- FAO. 2003. The Ecosystem Approach to Fisheries No. 4 Suppl. 2. Rome, FAO. 112 pp.
- FAO. 2011. Fisheries management. 4. Marine protected areas and fisheries. FAO Technical Guidelines for Responsible Fisheries. No. 4, Suppl. 4. Rome, FAO. 198 pp.
- FAO. 2014. Voluntary guidelines for securing sustainable small-scale fisheries in the context of food security and poverty eradication. Rome, FAO. 27 pp.
- Staples, D.; Brainard, R.; Capezzuoli, S.; Funge-Smith, S.; Grose, C.; Heenan, A.; Hermes, R.; Maurin, P.; Moews, M.; O'Brien, C. & Pomeroy, R. 2014. Essential EAFM. Ecosystem Approach to Fisheries Management Training Course. Bay of Bengal Large Marine Ecosystem (BOBLME) Project, Food and Agriculture Organization of the United Nations and US-Coral Triangle Initiative, National Oceanic and Atmospheric Administration. xxiv +148 pp.



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STRATEGIC ACTION PROGRAMME

BAY OF BENGAL LARGE MARINE ECOSYSTEM

Eight countries connected by one ecosystem, working together to secure its future