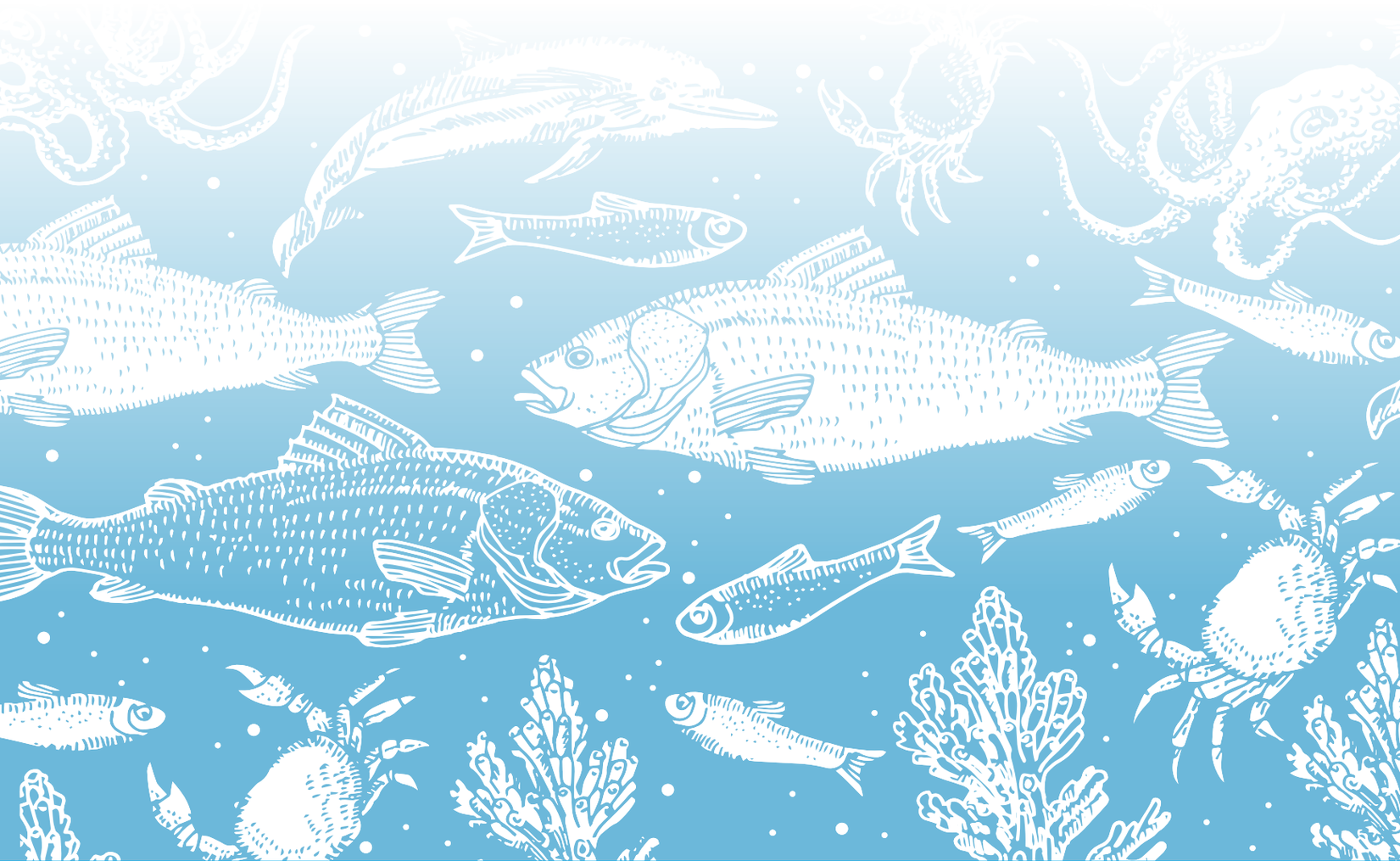
# Mainstreaming Biodiversity into Coastal and Marine Fisheries Sector

## Fact Sheets



**Centre for Biodiversity Policy and Law**
**National Biodiversity Authority**
**Taramani, Chennai - 600 113**
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## Brief about the Fact Sheets

To conserve and manage the coastal and marine resources of India, the CEBPOL, NBA has brought out a set of 9 fact sheets for the benefit of policy makers, scientists, researchers, academicians to mainstream biodiversity considerations into the public and private sector projects and programmes. The fact sheets cover the following subjects:

1. India's Coastal and Marine Faunal Diversity
2. Ecologically Sensitive Areas
3. Ecologically or Biologically Significant Marine Areas and Marine Protected Areas
4. Ecosystem Approach to Fisheries Management
5. Invasive Alien Species
6. Co-management
7. Coastal and Marine Species under the Wildlife (Protection) Act, 1972
8. India National Biodiversity Targets: Linkages with the Coastal and Marine Sector
9. Sustainable Development Goal -14: Life Below Water

### Facts and Figures

| Global | India |
|---|---|
| The global fish production was estimated at 171 million metric tonnes (mmt) in 2016, which includes production from aquaculture (80.0 mmt) and capture fisheries (91.0 mmt).<br><br>In 2016, nearly 59.6 million people were engaged in capture fisheries and aquaculture, with 19.3 million people engaged in aquaculture and 40.3 million people engaged in fisheries.<br><br>The oceans contain more than 200,000 identified species.<br><br>The market value of marine and coastal resources and industries is estimated at US$ 3 trillion per year, about 5 percent of global GDP. | India is one of the mega diversity countries in the world. In the marine sector, the Indian seas harbor 26, 866 faunal species of the total estimated global species (2,47,605 nos).<br><br>Nearly 4.0 million fishers depend on the coastal and marine fishery resources and contribute 0.91 percent to the national GDP and 5.23 percent to the agriculture GDP.<br><br>India has an Exclusive Economic Zone (EEZ) of 2.02 million sq.km and a long coastline of 8118 km. The maximum sustainable yield of fisheries in the Indian EEZ is estimated at 4.412 mmt. |

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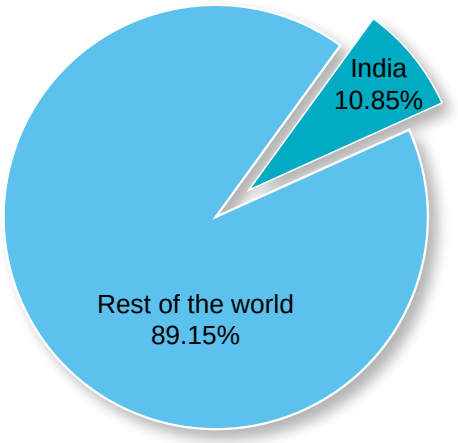
# Mainstreaming Biodiversity into Coastal and Marine Fisheries Sector

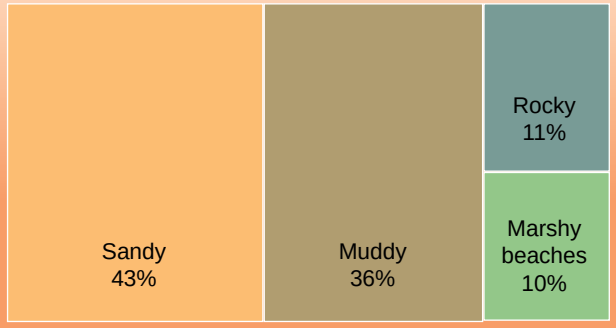
## India's Coastal & Marine Faunal Diversity

India is one of the mega diversity countries in the world, due to its unique bio-geographical location, diversified climatic conditions and enormous eco-diversity. With mere 2.4 percent of the landmass, India holds an estimated total of 1, 01,167 faunal species, which is about 6.45 percent of the total species in the world (1,566,353 species). In the marine sector, the Indian seas harbor 10.85 percent (26,866 nos. of species) of the total estimated global species (2,47,605 nos).



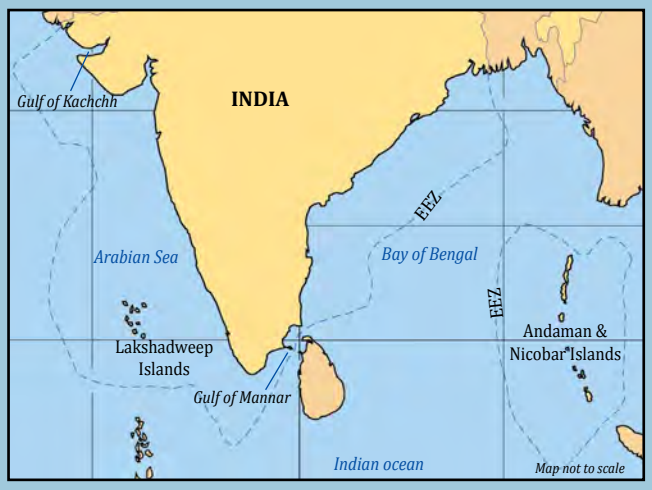

The Indian coastal and marine (C&M) ecosystems comprise mudflats, estuaries, creeks, mangroves, coral reefs, marshes, lagoons, seagrass beds, sandy and rocky beaches. Together, these ecosystems cover an estimated area of 42,808 sq. km and provide habitat for a variety of aquatic flora and fauna. The coastal geomorphology of India includes 43 percent of sandy, 11 percent of rocky, 36 percent of muddy and 10 percent of marshy beaches in mainland adjoining areas.

## The coastal geomorphology of India




The extensive marine biodiversity of India is mostly reported from four major areas in coastal and Island habitats such as Gulf of Mannar, Gulf of Kachchh, Andaman and Nicobar Islands and Lakshadweep.

The country has an Exclusive Economic Zone (EEZ) of 2.02 million sq. km and a long coastline of 8,118 km. Besides providing an ideal habitat for diverse C&M biodiversity, these ecosystems provide a range of ecosystem services contributing to economic stability of the country.




### Global and Indian marine faunal diversity: *A comparison*

| Taxon/group | India | Andaman & Nicobar | World |
|---|---|---|---|
| Protozoa | 2,577 | 09 | 31,250 |
| Porifera | 512 | 126 | 8,339 |
| Cnidaria | 1,385 | 911 | 12,553 |
| Ctenophora | 19 | 01 | 197 |
| Platyhelminthes | 832 | 05 | 12,821 |
| Polyclad | 46 | 35 | 1005 |
| Gastrotricha | 61 | 18 | 497 |
| Rotifera | 47 | 07 | 172 |
| Acanthocephala | 229 | - | 6,000 |
| Nematoda | 356 | 27 | 6,833 |
| Mollusca | 3,400 | 1,200 | 42,579 |
| Opisthobranchia | 389 | 213 | 3,736 |
| Annelida | 590 | 235 | 11,800 |
| Arthropoda | 3,956 | 897 | 50,588 |
| Sipuncula | 41 | 27 | 147 |
| Tardigrada | 8 | 04 | 202 |
| Bryozoa | 272 | 46 | 6,148 |
| Brachiopoda | 8 | - | 419 |
| Echinodermata | 777 | 499 | 7,000 |
| Chaetognatha | 44 | 20 | 131 |
| Hemichordata | 14 | 01 | 130 |
| Tunicata/Urochordata | 516 | 58 | 3,057 |
| Pisces | 3,267 | 1568 | 18,196 |
| Reptiles | 32 | 10 | 74 |
| Mammalia | 33 | 09 | 130 |
| Meiofauna | 961 | 484 | 21,606 |

*Source: Zoological Survey of India, 2017*

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# Mainstreaming Biodiversity into Coastal and Marine Fisheries Sector

## Ecologically Sensitive Areas

**"Ecologically Sensitive Areas (ESAs) are biologically diverse ecosystems which provide significant ecosystem services and their geomorphological features play a role in maintaining integrity of the coast."**

For conserving and protecting the coastal areas and marine waters, the Coastal (Regulation) Zone, 2019 was notified under the Environment (Protection) Act, 1986. Under this notification, CRZ-I area (environmentally most critical) is further classified as CRZ-I A, which consists of ecologically sensitive areas (ESAs). The CRZ-1 A area includes (i) Mangroves; (ii) Corals and coral reefs; (iii) Sand dunes; (iv) Biologically active mudflats; (v) National parks, marine parks, sanctuaries, reserve forests, wildlife habitats; (vi) Salt marshes; (vii) Turtle nesting grounds; (viii) Horse shoe crab habitats; (ix) Seagrass beds; (x) Nesting grounds of birds; (xi) Areas or structures of archaeological importance and heritage sites.

| Ecologically Sensitive Areas | Sq.km |
|---|---|
| Horse shoe crab habitat | 72.35 |
| Corals | 1 400.92 |
| Mangroves | 5 403.39 |
| Seagrass | 516.60 |
| Salt marsh | 465.75 |
| Turtle nesting ground | 184.87 |
| Bird nesting ground | 786.36 |
| Sand dunes | 246.90 |
| Mud flats | 5 621.23 |
| Archaeological and heritage site | 5.97 |

*Source: NCSCM, Prepared for the UNFCCC, COP22.*

## Protection of ESAs – What do the Aichi & National Biodiversity Targets say!

### Aichi Biodiversity Target 11

By 2020, at least 17 percent of terrestrial and inland waters and 10 percent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes.

### India's National Biodiversity Target 6

Ecologically representative areas under terrestrial and inland water, and also coastal and marine zones, especially those of particular importance for species, biodiversity and ecosystem services, are conserved effectively and equitably, based on protected area designation and management and other area-based conservation measures and are integrated into the wider landscapes and seascapes, covering over 20 percent of the geographic area of the country, by 2020.

The extent of coastal ecosystems *viz.*, mangroves, coral reefs, seagrass and salt marshes in India, including its Island territories have been mapped and estimated to be 7,800 sq. km.

### Way forward

1. ESAs such as mangroves, corals, seagrass beds, sand dunes and mudflats should be conserved on priority basis as they are important for turtle nesting and feeding and nesting ground for birds and various other ecological services vital for sustaining biodiversity in the C&M waters. Further, areas inhabited by marine mammals should also be considered for conservation though appropriate regulatory mechanisms. The areas already identified by the National Institutions could be first brought under conservation.

2. The Biological Diversity Act, 2002 stipulates that the State Governments in consultation with the local bodies can notify C&M areas of biodiversity importance (*e.g.,* key fish breeding sites, migratory routes, etc.) as Biodiversity Heritage Sites. Further, the State Governments in consultation with the Central Government may also frame rules for the management and conservation of all identified heritage sites.

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Fact Sheet 3

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# Mainstreaming Biodiversity into Coastal and Marine Fisheries Sector

# Ecologically or Biologically Significant Marine Areas and Marine Protected Areas

**"The Convention on Biological Diversity (CBD) defines Ecologically or Biologically Significant Marine Areas (EBSAs) as special areas in the ocean that serve important purposes, in one way or another, to support the healthy functioning of oceans and the many services that it provides."**

The ocean is under increasing threats from various human activities. The most pressing threats come from overfishing, destructive fishing practices, and illegal, unreported and unregulated (IUU) fishing activities. Other emerging problems include marine debris, ship-based marine pollution, transfer of alien invasive species, illegal dumping and the legacy of historical dumping, seabed mineral extraction, and noise pollution. The combined impacts of these threats as well as the potential impacts of climate change and ocean acidification have placed thousands of species at risk of extinction, and have impaired the structure, function, productivity and resilience of marine ecosystems.

Presently, the world's oceans are seriously under protected, with only approximately 0.8 percent of the oceans and 6 percent of territorial seas being within protected area systems. Hence CBD is requesting parties to identify EBSAs by using the following criteria for increasing the marine protected areas (MPAs).

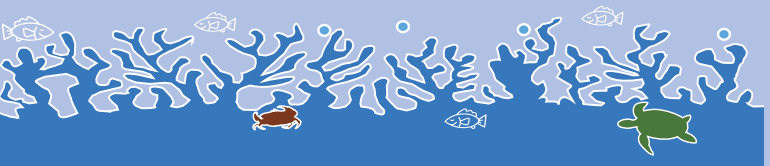
**Marine Protected Areas in Peninsular India**

| No. | Name | State | Category | Area | Year of establishment |
|---|---|---|---|---|---|
| 1 | Coringa | Andhra Pradesh | Sanctuary | 235.7 | 1978 |
| 2 | Krishna | Andhra Pradesh | Sanctuary | 194.81 | 1989 |
| 3 | Pulicat Lake (Part) | Andhra Pradesh | Sanctuary | 500 | 1980 |
| 4 | Dadra & Nagar Haveli | Dadra & Nagar Haveli | Sanctuary | 92.16 | 2000 |
| 5 | Fudam | Daman & Diu | Sanctuary | 2.18 | 1991 |
| 6 | Chorao Island | Goa | Sanctuary | 1.78 | 1988 |
| 7 | Marine (Gulf of Kachchh) | Gujarat | National Park | 162.89 | 1995 |
| 8 | Khijadia | Gujarat | Sanctuary | 6.05 | 1981 |
| 9 | Marine (Gulf of Kachchh) | Gujarat | Sanctuary | 295.03 | 1980 |
| 10 | Kadalundi Vallikkunnu Com R | Kerala | Community Reserve | 1.50 | 2007 |
| 11 | Malvan Marine | Maharashtra | Sanctuary | 29.12 | 1987 |
| 12 | Thane Creek Flamingo | Maharashtra | Sanctuary | 16.905 | 2015 |
| 13 | Bhitarkanika | Odisha | National Park | 145 | 1998 |
| 14 | Bhitarkanika | Odisha | Sanctuary | 672 | 1975 |
| 15 | Chilka (Nalaban) | Odisha | Sanctuary | 15.53 | 1987 |
| 16 | Gahirmatha | Odisha | Sanctuary | 1435 | 1997 |
| 17 | Balukh and Konark | Odisha | Sanctuary | 71.72 | 1984 |
| 18 | Gulf of Mannar | Tamil Nadu | National Park | 6.23 | 1980 |
| 19 | Point Calimere | Tamil Nadu | Sanctuary | 172.6 | 1967 |
| 20 | Pulicat Lake (Part) | Tamil Nadu | Sanctuary | 153.67 | 1980 |
| 21 | Sundarbans | West Bengal | National Park | 1,330.1 | 1984 |
| 22 | West Sundarbans | West Bengal | Sanctuary | 556.45 | 2013 |
| 23 | Haliday Island | West Bengal | Sanctuary | 5.95 | 1976 |
| 24 | Sajnakhali | West Bengal | Sanctuary | 2,091.12 | 1976 |
| 25 | Lothian Island | West Bengal | Sanctuary | 38 | 1976 |

*Source: Wildlife Institute of India, 2014* **excluding small island MPAs of Andaman and Nicobar Islands*

### Criteria for identifying EBSA

1. Uniqueness or rarity.
2. Special importance for life history stages of species.
3. Importance for threatened, endangered or declining species and/or habitats.
4. Vulnerability, fragility, sensitivity, or slow recovery.
5. Biological productivity.
6. Biological diversity.
7. Naturalness.



## Marine Protected Areas

In India, the MPAs are set up under the Wildlife (Protection) Act, 1972 and are used for conserving economic resources, biodiversity and for protection of species. There are 25 MPAs in peninsular India and 106 in Island Territories (Andaman & Nicobar Islands and Lakshadweep). These MPAs have unique marine biodiversity and provide a range of ecological services. India has also identified 12 protected areas as transboundary protected areas under the framework of the Transboundary Protected Area Programme of the International Union for Conservation of Nature, which include the Gulf of Mannar Marine Biosphere Reserve and the Sundarbans National Park.

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Fact Sheet 4

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# Mainstreaming Biodiversity into Coastal and Marine Fisheries Sector

# Ecosystem Approach to Fisheries Management (EAFM)

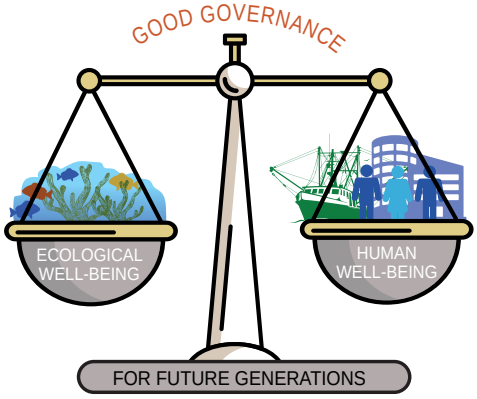
**"A better and more holistic way to manage complex marine capture fisheries."**

## What is an ecosystem approach?

- It is integrated management across land, water and natural resources that promotes both conservation and sustainable use of the entire ecosystem.
- It strives to find a balance between ecological well-being and human well-being through good governance.

## Why the ecosystem approach?

- Fisheries face many threats and issues that reduce their potential to contribute to sustainable development.




*Ecosystem Approach to Fisheries Management*

- In the past, fisheries management has taken a single species approach, but there are few success stories.
- There is a need to account for the broader ecosystem impacts of fisheries and to manage more holistically.

## EAFM builds on what is in place

- Builds on and improves existing management.
- Strengthens agencies through better planning and cooperation.
- Builds on and integrates co-management and other participatory approaches.
- Uses traditional, local and scientific knowledge that already exists.
- Improves human capacity needed for sustainable development.

## EAFM strengthens co-management

- Encourages stakeholder engagement
- Improves facilitation skills
- Uses effective negotiation
- Facilitates conflict resolution

*Source: www.eafmlearn.org*

## Key principles of EAFM

- Good governance
- Appropriate scale
- Increased participation
- Multiple objectives
- Cooperation and coordination
- Adaptive management
- Precautionary approach

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Fact Sheet 5

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# Mainstreaming Biodiversity into Coastal and Marine Fisheries Sector

## Invasive Alien Species

**"The Convention on Biological Diversity (CBD), 1993 defines invasive alien species as species whose introduction and/or spread outside their natural past or present distribution threatens biological diversity. It occurs in all taxonomic groups, including animals, plants, fungi and microorganisms, and can affect all types of ecosystems."**

Invasive alien species are considered to be one of the main direct drivers of biodiversity loss at the global level. The common characteristics of such species include rapid reproduction and growth, high dispersal ability, phenotypic plasticity (ability to adapt physiologically to new conditions), and ability to survive

### What do the National and International Targets say about Invasive Alien Species?

**Aichi Biodiversity Target 9** - By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated and measures are in place to manage pathways to prevent their introduction and establishment.

**India's National Target 4** - By 2020, invasive alien species and pathways are identified and strategies to manage them developed so that populations of prioritized invasive alien species are managed.

**Sustainable Development Goal Target 15.8** - By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority invasive species.

on various food types and in a wide range of environmental conditions.

The problem of invasive alien species continues to grow, essentially due to global trade, transport and travel, including tourism, at an enormous cost to human and animal health and the socio-economic and ecological well-being of the world.

Movement of ships is the most important pathway in the movement of marine organisms from country to country and from sea to sea. Ballast water discharges are also known to cause toxic algal blooms. In India, during the period 1998-2010, nearly 80 algal blooms have been reported, of which 31 blooms were formed by dinoflagellates, 27 by cyanobacteria and 18 by diatoms.

**The Zoological Survey of India has compiled a list of 157 invasive alien species.**

- Out of the 157 recorded alien species, 58 are found on land and in freshwater habitat and 99 are found in the marine ecosystem. Among the marine species, genus Ascidia accounts for maximum number of species (31), followed by Arthropods (26), Annelids (16), Cnidarian (11), Bryzoans (6), Molluscs (5), Ctenophora (3) and Entoprocta (1).

The invasive *Carijoa riisei* (snowflake coral) is found in the Andaman and Nicobar Islands, the Gulf of Mannar and the Gulf of Kachchh. The coral, native to the tropical western Atlantic Ocean, has spread to many other parts of the world. Scientists have recently discovered the presence of several colonies of this invasive species off the coast of Thiruvananthapuram and Kanyakumari and have warned that this invasive species could pose a serious threat to the marine ecology of the region.

*Snowflake coral*

Today, the safety standards for biological control are far more rigorous. The Ballast Water Management Convention, 2004 aims to prevent the spread of harmful aquatic organisms from one region to another, by establishing standards and procedures for the management and control of ships' ballast water and sediments.

**Way forward:** The Government may consider preparing national-level strategy for mapping and creating a database on 'Invasive Alien Species' in the coastal and marine waters. Such strategy may also include a national-level policy on 'Prevention and Management of Invasive Alien Species' in the Indian Exclusive Economic Zone.

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# Mainstreaming Biodiversity into Coastal and Marine Fisheries Sector

## Co-management

Co-management is often suggested as a viable option to address fisheries issues such as over-exploitation and fishing pressure. More importantly, it is the third option (others: Govt. control, privatization), where all stakeholders are likely to be fully involved in decision-making and implementation.

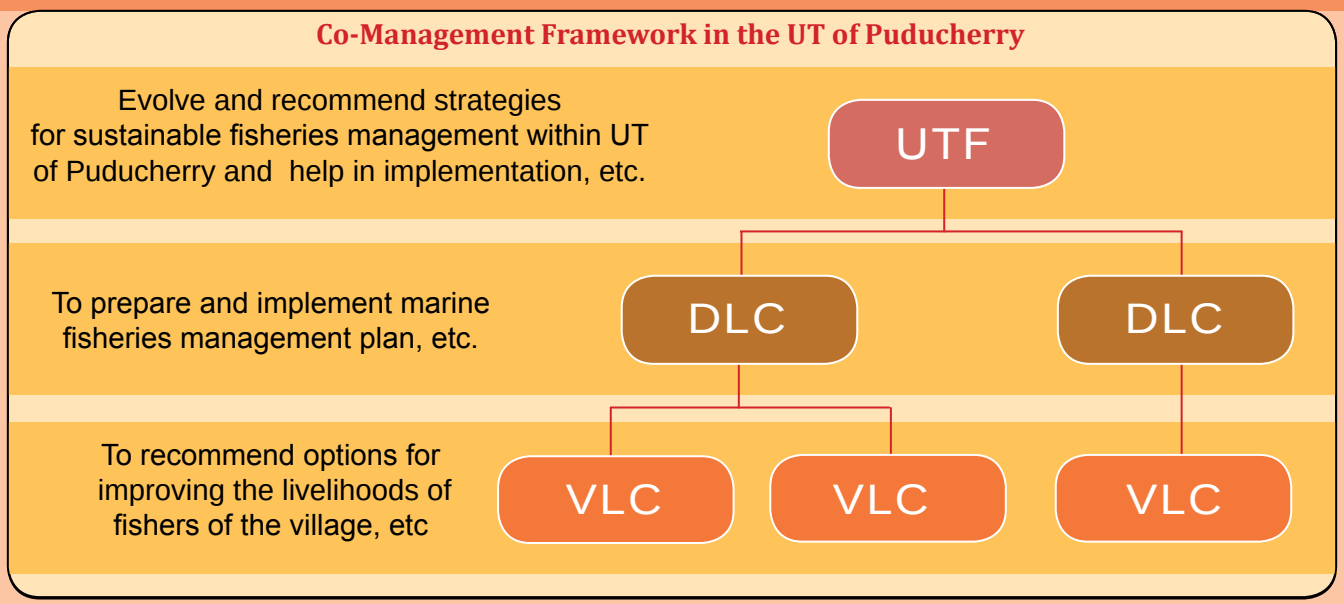
**Co-Management in India – The Union Territory (UT) of Puducherry has become the first to formalize co-management structures in marine fisheries in the country.**

Based on the three-tier structure (Village, District and Union Territory-level) proposed by the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), and after carrying out a large number of

**The 9 advantages of co-management**

- Sustainable utilization of fisheries resources;
- Empowerment of communities;
- Asset creation and capacity building of all stakeholders;
- Better knowledge creation and knowledge sharing;
- Sound and transparent decision-making;
- Minimizing social conflicts; and
- Ensuring occupational safety and disaster preparedness of fishing communities and other stakeholders;
- Improved enforcement of rules and regulations; and
- Optimisation of economic benefits.

## Co-Management Framework in the UT of Puducherry





stakeholder consultations involving all the fishing villages in Puducherry and Karaikal districts of the UT by the Department of Fisheries & Fishermen Welfare and the BOBP-IGO, the Government of Puducherry notified the setting up of co-management structures on 22 February 2019 to sustainably manage its fisheries resources in the marine sector.

As per the notification, a three-tier system of co-management bodies will be set up comprising Village-level Committees (VLCs); two District Level Councils (DLCs) and one Union Territory-Level Forum (UTF). The notification also includes a set of guidelines, describing the regular functions of the Village, District and the UT-level Committees for the smooth operationalization of co-management regime in the UT of Puducherry.

It is recommended that these co-management units may build organic linkages with the Biodiversity Management Committees (BMCs) constituted under the Biological Diversity Act, 2002.

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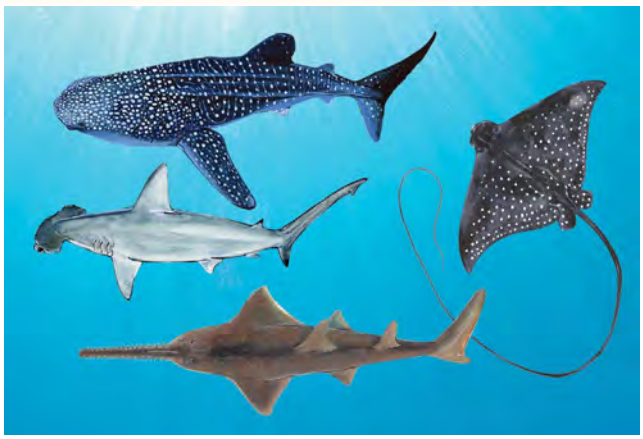
# Mainstreaming Biodiversity into Coastal and Marine Fisheries Sector

# C&M Species under Indian Wildlife (Protection) Act, 1972

The Wildlife (Protection) Act, 1972 (WLPA,1972) is an Act of the Parliament of India enacted for protection of plants and animal species available in the terrestrial, coastal and marine region (up to 12 nautical miles). The Act has 6 Schedules, which give varying degrees of protection.

India has 885 protected marine faunal species and they are placed under Schedules I-IV of the WLPA, 1972. These include 10 species of sponges, 619 species of corals, 24 species of mollusca, 163 species of echinodermata, 34 species of fishes, 6 species of reptiles and 26 species of marine mammals (Details in the table on back page).

- Schedule I and Part II of Schedule II provide absolute protection - offences under these are prescribed with highest penalties.
- Species listed in Schedule III and Schedule IV are also protected, but the penalties are much lower.



| Faunal group | Protected species (#) | Schedule |
|---|---|---|
| **Porifera** | | |
| Calcareous sponges (all species) | 10 | Schedule III |
| **Coelenterata** | | |
| Reef-building corals (all scleractnians) | 519 | Schedule I |
| Black corals (all antipatharians) | 08 | Schedule I |
| Organ pipe coral (*Tubipora musica*) | 01 | Schedule I |
| Fire corals (all millepora species) | 05 | Schedule I |
| Sea fans (all gorgonians) | 86 | Schedule I |
| **Arthropoda** | | |
| Robber crab (Crustacea) | 01 | Schedule I |
| Horseshoe crab (Merostomata) | 02 | Schedule IV |
| **Mollusca** | | |
| Gastropoda | 20 | Schedules I, IV |
| Bivalvia | 04 | Schedule I, IV |
| Echinodermata | | |
| Sea cucumber (all holothuria) | 163 | Schedule I |
| **Fishes** | | |
| Elasmobranchs (sharks and rays) | 10 | Schedule I |
| Sea horses (all syngnathidians) | 23 | Schedule I |
| Giant grouper | 01 | Schedule I |
| **Reptiles** | | |
| Marine turtles | 05 | Schedule I |
| Saltwater crocodile | 01 | Schedule I |
| **Mammals** | | |
| Marine mammals | 26 | Schedules I, II |
| **Total** | **885** | |

*Source: ENVIS, Wildlife Institute of India, 2014*

## Coral hotspots of India

Corals are marine invertebrates of the phylum Cnidaria. They typically live in compact colonies of many identical individual polyps. In soft corals, there is no stony skeleton but the tissues are often toughened by the presence of tiny skeletal elements known as sclerites, which are made from calcium carbonate. Hard coral species are reef builders and secrete calcium carbonate to form a hard skeleton. So far, 158 soft corals and 627 hard corals have been reported in India.

| Hotspots | Total no. Species |
|---|---|
| Andaman & Nicobar Islands | 697 |
| Gulf of Mannar & Palk Bay | 244 |
| Lakshadweep | 206 |
| Gulf of Katchchh | 66 |

*Source: Zoological Survey of India, 2017*

## Species Recovery Plans

The highly threatened marine species of India are conserved on priority basis using special 'Species Recovery Plans'. Under this Plan, the following seven threatened marine taxa have been selected for preparation of recovery plans:

- **Dugong**
- **Whale shark**
- **Marine turtles (two species)**
- **Giant clams**
- **Sea cucumbers**
- **Horseshoe crabs and**
- **Sea horses**

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# Mainstreaming Biodiversity into Coastal and Marine Fisheries Sector

# India's National Biodiversity Targets: Linkages with the Coastal & Marine Sector

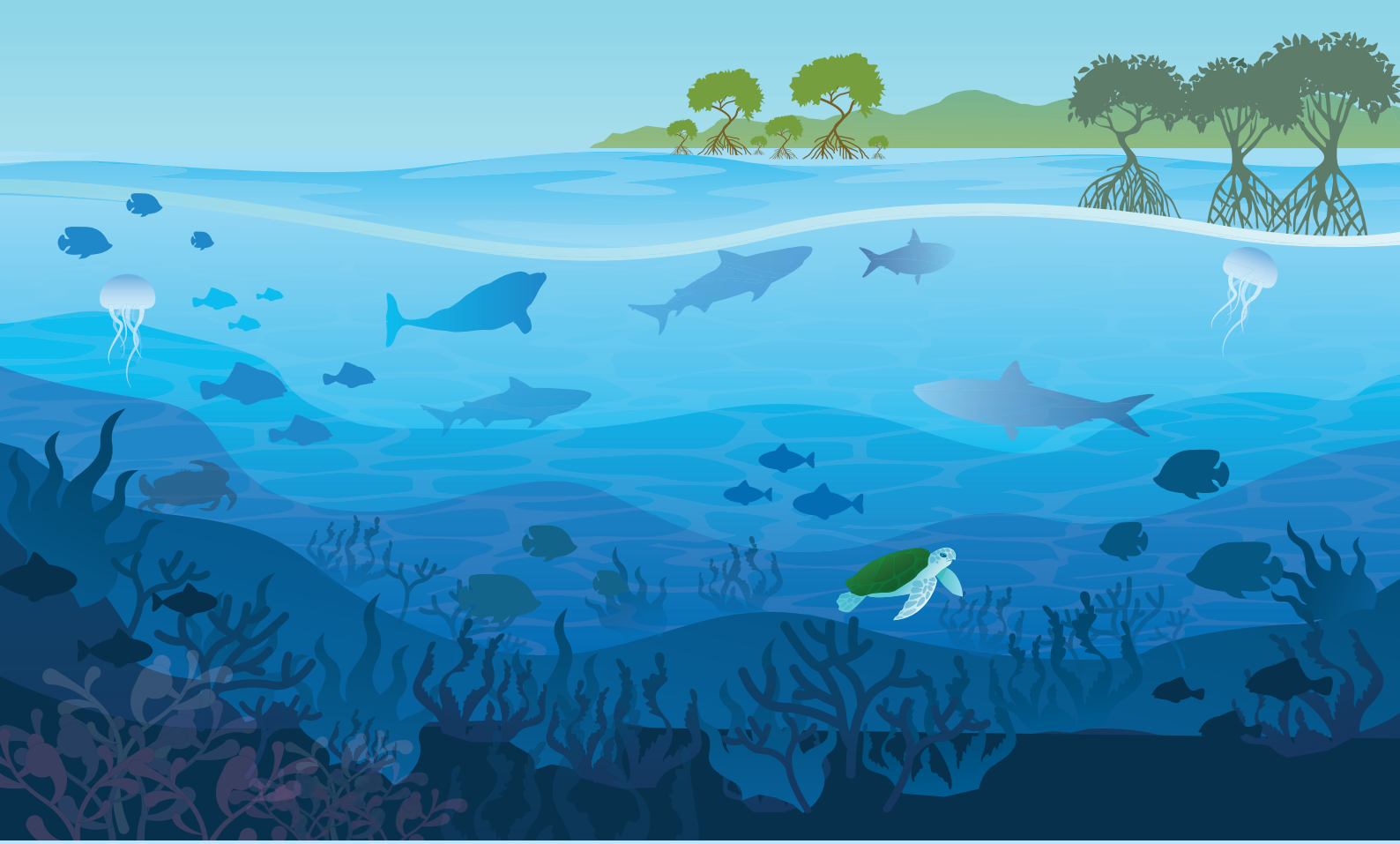
As a party to the Convention on Biological Diversity (CBD), India is mandated to prepare its National Biodiversity Strategy and Action Plan for implementing the Convention at the national level.

India has prepared its National Biodiversity Action Plan (NBAP) in 2008. India's NBAP is broadly aligned with the five Strategic Goals of CBD and the 20 Aichi Biodiversity Targets (ABT) relating to Strategic Plan for Biodiversity (SP) 2011-2020 adopted during the Conference of the Parties (CoP -10) to the CBD in Nagoya, Japan in 2010.

In pursuance of the decision of CoP-10, India has also prepared 12 National Biodiversity Targets (NBTs) using the ABT as a framework. These 12 NBTs have been conceptualized through multi-stakeholder participation. Further, a road map for achieving these targets has been developed by evolving indicators, responsible agencies and frequency of monitoring and reporting against each target. This fact sheet provides information on all the 12 NBTs and further highlights the four targets that are most relevant to coastal and marine sector.

## India's National Biodiversity Targets

1. By 2020, a significant proportion of the country's population, especially the youth, is aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.



2. By 2020, values of biodiversity are integrated in national and state planning processes, development programmes and poverty alleviation strategies.

3. Strategies for reducing rate of degradation, fragmentation and loss of all natural habitats are finalized and actions put in place by 2020 for environmental amelioration and human well-being.

4. By 2020, invasive alien species and pathways are identified and strategies to manage them developed so that populations of prioritized invasive alien species are managed.

5. By 2020, measures are adopted for sustainable management of agriculture, forestry and fisheries.

6. Ecologically representative areas under terrestrial and inland waters, and also coastal and marine zones, especially those of particular importance for species, biodiversity and ecosystem services, are conserved effectively and equitably, based on protected area designation and management and other area based conservation measures and are integrated into the wider landscapes and seascapes, covering over 20% of the geographic area of the country, by 2020.

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

8. By 2020, ecosystem services, especially those relating to water, human health, livelihoods and well-being, are enumerated and measures to

safeguard them are identified, taking into account the needs of women and local communities, particularly the poor and vulnerable sections.

9. By 2015, 'Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization' as per the Nagoya Protocol are operational, consistent with national legislations.

10. By 2020, an effective, participatory and updated national biodiversity action plan is made operational at different levels of governance.

11. By 2020, national initiatives using communities' traditional knowledge relating to biodiversity are strengthened, with the view to protecting this knowledge in accordance with national legislations and international obligations.

12. By 2020, opportunities to increase the availability of financial, human and technical resources to facilitate effective implementation of the Strategic Plan for Biodiversity 2011-2020 and the national targets are identified and the Strategy for Resource Mobilization is adopted.

## Linkages between Aichi and National Biodiversity Targets related to coastal and marine sector

### National Biodiversity Targets


### Aichi Biodiversity Targets

**Target 6**

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

**Target 9**

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

**Target 10**

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

**Target 11**

By 2020, at least 17 percent of terrestrial and inland water, and 10 percent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

## National Biodiversity Targets, Indicators and Responsible Agencies Related to Coastal and Marine Sector

| Targets | Indicators | Responsible agencies |
|---|---|---|
| **Target 3:** Strategies for reducing rate of degradation, fragmentation and loss of all natural habitats are finalized and actions put in place by 2020 for environmental amelioration and human well-being. | Trends in mangrove cover and coastal area management. | Fishery Survey of India (FSI); National Centre for Coastal Research, Ministry of Earth Sciences, Integrated Coastal Zone Management, Project Unit of Society of Integrated Coastal Management; National Centre for Sustainable Coastal Management (NCSCM), Ministry of Environment, Forests and Climate Change and Department of Space (DoS). |
| **Target 4:** By 2020, invasive alien species and pathways are identified and strategies to manage them developed so that populations of prioritized invasive alien species are managed | Trends in invasive alien species management. | Forest Department, DoS, Wildlife Institute of India (WII), Centre for Marine Living Resources and Ecology (CMLRE) and National Institute of Oceanography. |
| **Target 5:** By 2020, measures are adopted for sustainable management of agriculture, forestry and fisheries. | Trends in stock sizes of target and bycatch fish species (freshwater and marine). | FSI, Central Marine Fisheries Research Institute (CMFRI), National Fisheries Development Board (NFDB), CMLRE and National Bureau of Fish Genetic Resources. |
| | Trends in intensity of destructive fishing practices. | Department of Fisheries, Government of India, NFDB, Central Institute of Fisheries Technology and FSI. |
| | Trends in sustainable fishing practices. Trends in number of fishing boats/ fishing capacity. | NFDB and Department of Fisheries of coastal States/UTs. |
| **Target 6:** Ecologically representative areas under terrestrial and inland waters, and also coastal and marine zones, especially those of particular importance for species, biodiversity and ecosystem services, are conserved effectively and equitably, based on protected area designation and management and other area based conservation measures and are integrated into the wider landscapes and seascapes, covering over 20% of the geographic area of the country, by 2020. | Status and population trends of 7 marine species. | CMLRE, Zoological Survey of India, FSI, National Centre for Antarctic & Oceanic Research and CMFRI. |

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# Mainstreaming Biodiversity into Coastal and Marine Fisheries Sector

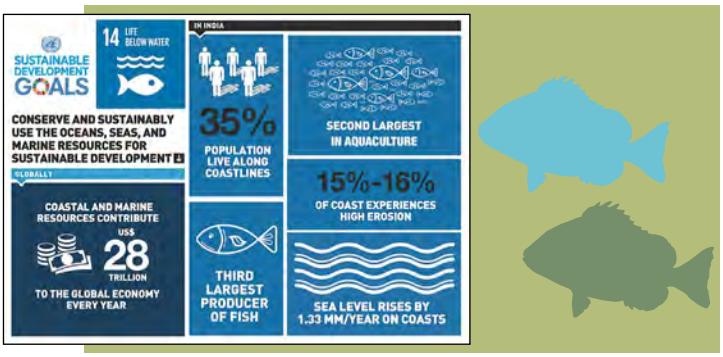
# Sustainable Development Goal -14: Life Below Water


**"The Sustainable Development Goals (SDGs) comprise 17 goals with the larger aim to end poverty, fight inequality, and tackle climate change within the next 15 years."**

## Goal 14: Life below water

The SDG -14 aims to sustainably manage and protect marine and coastal ecosystems from pollution, as well as address the impacts of ocean acidification.

Enhancing conservation and the sustainable use of ocean-based resources through international law will also help mitigate some of the challenges facing our oceans.



## SDG 14: Targets and Indicators

| | | |
|---|---|---|
| Target | 14.1 | By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution. |
| Indicator | 14.1.1 | Index of coastal eutrophication and floating plastic debris density. |
| Target | 14.2 | By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans. |
| Indicator | 14.2.1 | Proportion of national Exclusive Economic Zone (EEZ) managed using ecosystem-based approaches. |
| Target | 14.3 | Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels. |
| Indicator | 14.3.1 | Average marine acidity (pH) measured at agreed suite of representative sampling stations. |
| Target | 14.4 | By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated (IUU) fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce MSY as determined by their biological characteristics. |
| Indicator | 14.4.1 | Proportion of fish stocks within biologically sustainable levels. |
| Target | 14.5 | By 2020, conserve at least 10 percent of coastal and marine (C&M) areas, consistent with national and international laws and based on the best available scientific information. |
| Indicator | 14.5.1 | Coverage of protected areas in relation to marine areas. |
| Target | 14.6 | By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to IUU fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries (LDCs) should be an integral part of the WTO fisheries subsidies negotiation. |
| Indicator | 14.6.1 | Progress by countries in the degree of implementation of international instruments aiming to combat IUU fishing. |
| Target | 14.7 | By 2030, increase the economic benefits to Small Island Developing States (SIDS) and LDCs from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism. |
| Indicator | 14.7.1 | Sustainable fisheries as a percentage of GDP in SIDS, LDCs and all countries. |
| Target | 14.A | Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular SIDS and LDCs. |
| Indicator | 14.A.1 | Proportion of total research budget allocated to research in the field of marine technology. |
| Target | 14.B | Provide access for small-scale artisanal fishers to marine resources and markets. |
| Indicator | 14.B.1 | Progress by countries in the degree of application of a legal/regulatory/policy/institutional framework which recognizes and protects access rights for small-scale fisheries. |
| Target | 14.C | Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of 'The Future We Want'. |
| Indicator | 14.C.1 | Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the UNCLOS for the conservation and sustainable use of the oceans and their resources. |

*Source: sustainabledevelopment.un.org*

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***About NBA***

The National Biodiversity Authority (NBA) is an autonomous body established by the Government of India for implementation of the provisions of the Biological Diversity Act, 2002. As a statutory body, the NBA regulates the activities of access to biological resources and associated traditional knowledge and sharing of benefits arising from their use. Besides, the Authority performs an advisory role in matters related to conservation, sustainable use and access to biological resources and benefit sharing.

***About CEBPOL***

The Centre for Biodiversity Policy and Law (CEBPOL), set up within the NBA, is a bilateral collaborative programme established between India and Norway in 2013 to develop professional expertise in biodiversity policies and laws and to develop capacity of stakeholders at various levels. This Centre is focusing on biodiversity policies and laws that cater to the needs of national and international rule-making and their implementation on matters concerning biodiversity. Some of the thematic areas identified under this collaborative initiative include: Mainstreaming Biodiversity, Nature Index, Access and Benefit Sharing, Multilateral Environment Agreements, Invasive Alien Species and Capacity Building.

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