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MEMORANDUM OF UNDERSTANDING ON THE CONSERVATION AND MANAGEMENT OF MARINE TURTLES AND THEIR HABITATS OF THE INDIAN OCEAN AND SOUTH-EAST ASIA

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Agenda Item 9.1

INDIA – NATIONAL REPORT 2019

(Prepared by India)

IOSEA MARINE TURTLES MEMORANDUM OF UNDERSTANDING - NATIONAL REPORTING 2019

IOSEA Marine Turtles MoU - National Reports

The purpose of completing the national report is to provide information on your country's implementation of the IOSEA Marine Turtle MoU including, as far as possible, contributions of cooperating non-governmental partners. Implementation will be assessed in terms of the six objectives of the Conservation and Management Plan (CMP). The online questionnaire is divided into these six main objectives, and asks specific questions in relation to the activities that need to be carried out to fulfil those objectives.

Please answer all questions as fully and as accurately as possible. It may seem time-consuming, but once you have completed the first report, the next time will be much easier because you can simply revise your existing report online. Comprehensive responses to the questions posed in Section 1.4 should satisfy many of the reporting requirements of the 2004 FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations, thereby avoiding duplication of effort.

Description text is provided below some of the questions to explain what information needs to be provided. Text boxes can be expanded to accommodate longer answers or to explain and provide additional information, beyond what is requested. Details of future plans are especially encouraged. Wherever possible, please try to indicate the source of information used to answer a particular question, if a published reference is available. Remember that you are sharing information with other countries about your progress, so that it may be of benefit to them. At the same time, you may find it useful to look at other countries' reports to get ideas for marine turtle conservation that might be adapted to your context.

When working on the online questionnaire, save your information by clicking on the "Save all" button inside each section. An auto-save feature also saves any changed responses every 30 seconds, and whenever you move between sections. Feel free to attach additional material (published reports, maps etc) to this questionnaire.

Throughout the questionnaire, alongside each question you will find one or more 3-letter abbreviations within square brackets. These are used to indicate the purpose for which the information provided will be used in the subsequent analysis of all of the national reports, as shown in the following table.

To some extent, the order in which these different types of information are listed below is a reflection of their importance – ranging from critical indicators of performance to factual details that are merely informative.

Abbreviation	**Type**	**Treatment / Purpose**
IND	Indicator	The information provided serves, in and of itself, as a key indicator of successful implementation or of pre-requisites for same (eg. of core actions undertaken, resource availability, capacity etc.)
PRI	Priorities	The collective data will be synthesized to give an indication of what has been done already (helping to avoid duplication of effort); what is generally not being done (gaps that need to be addressed); and what interventions or specific assistance may be required.
TSH	Trouble-shooting	

Particular implementation problems and issues (possibly of special interest to a small group of countries) are identified/highlighted with a view to stimulating remedial action in the short-term.

BPR

Best practice

Well-documented examples of best practices / success stories will be compiled and presented as approaches that other Signatory States might consider pursuing (ie adopting or adapting to suit their own circumstances).

SAP

Self-Appraisal

Self-assessment of effectiveness and completeness of actions undertaken – intended to stimulate reflection within a given Signatory State on what more could or should be done in relation to a particular activity.

INF

Information

The information will be collected and compiled, with little or no modification, mainly for purpose of sharing of information that could be of interest or value to other readers and/or other analyses.

GENERAL INFORMATION

Signatory State:
Which agency or institution has been primarily responsible for the preparation of this report?
› Ministry of Environment, Forest and Climate Change
Government of India
Indira Paryavaran Bhawan Jor Bagh, Jor Bagh Road NEW DELHI 110003
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List any other agencies, institutions, or NGOs that have provided input:
› Wildlife Institute of India, Post Box 18,
Chandrabani,
Dehra Dun - 248001 (Uttarakhand) India
Chief Wildlife Wardens
All 14 Coastal States/Union Territories of India
Dakshin Foundation,
Flat No. A-001, Samvriddhi Gardenia Apartments,
88/3, Byataranapura, near Sahakar Nagar A Block, Bangalore 560 092

Memorandum in effect in Signatory State since (dd/mm/yyyy):
› 20 February 2007

This report was last modified (dd/mm/yyyy):
› 5th April, 2019

Designated Focal Point (and full contact details):
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OBJECTIVE I: REDUCE DIRECT AND INDIRECT CAUSES OF MARINE TURTLE MORTALITY

1.1 Introduction to marine turtle populations and habitats, challenges and conservation efforts

Please introduce and summarise, in an abstract of less than a page, the marine turtle populations and their habitats in your country. Comment on their status and highlight the main conservation challenges and achievements to date. It is not necessary to list here by name the individual nesting beaches, feeding areas and developmental habitats that are important for marine turtles in your country, as this information can be generated from the 'Site-Threat' data sheets to be completed in Annex 1. **[INF]**

› India with 7517 km coastline and two marine eco-regions (Bay of Bengal and the Arabian Sea), supports five of the seven species of sea turtles found worldwide are reported to occur in Indian coastal waters. These are the Olive ridley (Lepidochelys olivacea), Green (Chelonia mydas), Hawksbill (Eretmochelys imbricata), Lleatherback (Dermochelys coriacea) and Loggerhead (Caretta caretta). Except for the Loggerhead, the remaining four species nest along the Indian coastline..

Further, India supports the largest known population of nesting olive ridley turtles, along the Odiysa coast, and the largest nesting population of leatherback turtles in the Andaman & Nicobar Islands in the south Asia region. Foraging areas used by these species are presumed to be, at least in part, within the Indian Ocean. The Andaman & Nicobar and Lakshadweep group of islands, with extensive coral formations and undisturbed lagoons, also support a large foraging population and some nesting populations of hawksbill and green turtles. The full extent of the foraging areas used by these species is undefined.

The Indian sub-continent is an important region for marine biodiversity conservation in general and sea turtle conservation in particular in the world. However, turtle populations and their habitats are under threat due to fisheries and other anthropogenic related activities along the coast. A variety of surveys and conservation oriented projects were carried out through the GOI UNDP National Sea Turtle Project implemented by the Wildlife Institute of India in 2000-2002. This was followed by a CMS-UNEP project implemented by the Madras Crocodile Bank Trust in 2003-2005. The research and reviews are compiled in Shanker and Choudhury 2006. Now, all coastal states and UTs of India have been monitoring the turtle nesting in their respective jurisdictions with established monitoring protocol.

India has continuously monitoring Olive ridley populations and their habitats in recent years with respect to coastal landscape dynamics, population dynamics and the impact of climate change on population sex ratios. Following studies on nesting and offshore populations in the 1990s, studies on migratory route and habitat use using satellite techniques were carried out by the Wildlife Institute of India and Odisha Forest Department from 2007-2012 with financial support of Directorate General of Hydrocarbons (DGH), Ministry of Petroleum, Government of India. This study has provided more insights for the long term conservation of sea turtles and for rational planning of developmental activities including possible hydrocarbon exploration in this region.

Long term monitoring of nesting populations and impacts of climate change on sex ratios is being carried out since 2007 at Rushikulya by Indian Institute of Science and Dakshin Foundation in collaboration with Odisha FD. Following two decades of surveys by the Madras Crocodile Bank Trust and Andaman and Nicobar Islands Environmental Team (ANET), long term monitoring of leather back turtles has been carried out at Little Andaman Island since 2008 by Indian Institute of Science, Dakshin Foundation and ANET in collaboration with A&N FD. Long term monitoring of foraging green turtle populations in the Lakshadweep Islands is being carried out by Nature Conservation Foundation and Forest Department. In addition, there are monitoring programmes for sea turtles by one or more non-governmental organisations in each of the states on India's coast, some for as long as 30 years, and the organisations also contribute significantly to outreach and education.

All five species of sea turtles that occur in Indian coastal waters are protected under Schedule I of the Wildlife Protection Act (1972), as well as listed in Appendix I of Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES) which prohibits trade in turtle products by signatory countries. At present, there is no commercial or

international trade of marine turtles or turtle products in India. However, incidental capture in trawl nets is a well-known cause of mortality for sea turtles; more than 10,000 dead turtles used to be washed ashore in Odisha alone each year. Both gill and trawl nets cause considerable mortality along the mainland coast.

Marine turtles have been included in the IDWH programme of MoEFCC to effectively promote people-inclusive conservation programmes to conserve turtle habitats. The Government of India is embarking on a Marine Turtle Conservation Plan in the near future.

1.2 Best practice approaches to minimizing threats

Describe any protocol or approaches practiced in your country, which you consider exemplary, for minimising threats to marine turtle populations and their habitats, which may be suitable for adaptation and adoption elsewhere. **[BRP]**

› India has identified all important marine turtle nesting areas as 'Important Coastal and Marine Biodiversity Areas' of India and included in the 'Coastal Eco-Sensitive Zone' that gets highest priority with respect to conservation under the Indian Environment Act (CRZ Regulation). Further, India has recently initiated an innovative model of sea turtle conservation with coastal communities i.e. Incentivation of Turtle Conservation. Under this programme, local communities (Maharashtra, Puducherry, etc) have been encouraged to monitor and protect the turtle nests from domestic/feral predators including from human. They were rewarded after

the successful release of hatchlings from these protected nests. Further, these communities are encouraged to promote the Turtle Tourism without disturbing them. Wildlife Institute of India has recommended the Puducherry Government to initiate the 'Marine Turtle Scholarship' to school going children of poor fishermen communities to strengthen the involvement of fishermen communities in Marine Turtle Conservation. The children would become 'Turtle Ambassadors' and promote conservation. Further, India has adopted globally accepted standard practices in marine turtle conservation and management which include offshore congregation protection, onshore nesting beach protection and management, arribada and sporadic nesting population monitoring, control and management of destructive practices and activities on the nesting beaches, fishing ban during breeding season, TED promotion and implementation, education and awareness and promotion of research on marine turtles. All of these are indeed adopted in the sense that they are acknowledged to be required, but the level of implementation of each varies, as indicated in various sections of this report (Shanker & Kutty 2005).
The Code of Conduct for Responsible Fisheries, which gives guidelines for sustainable development of fisheries, stresses the need for developing selective fishing gears in order to conserve resources, protect non-targeted resources and endangered species. Protection of juveniles and conservation of non-target species is therefore, imperative for balancing the ecosystem and removal of fish resources in a more sustainable manner. Under the auspices of the 'GOI-UNDP-GEF- Mainstreaming Biodiversity into production Sectors in the Sindhudurg Coast, Maharashtra' project, Square mesh net was introduced in Sindhudurg District of Maharashtra, with a view to demonstrate that biodiversity conservation of coastal areas and sustainable livelihoods can go hand in hand. Met with initial scepticism, the initiative has gone a long way in becoming something that fishermen have embraced in their journey to sustainable marine fishing. Since 2015, every trawler in the district now uses square mesh nets. In Sindhudurg District, several trawlers have adopted more sustainable fishing practices.
Arribada and sporadic nesting population monitoring is conducted in Odisha by the Wildlife Institute of India, Indian Institute of Science, and Forest Department; in Andaman and Nicobar Islands by the Indian Institute of Science and Andaman and Nicobar Environment Team; and in all the other states by various NGOs.
Several national and local organisations and individuals came together to form a national sea turtle network called Turtle
Action Group (TAG) in January 2009 to work together towards sea turtle conservation in India.
In addition, fishing communities and conservation groups have formed the Odisha Marine Resources Conservation Consortium (OMRCC) to provide a platform for dialogue and collaborative action. A leatherback recovery plan has been prepared to initiate long-term monitoring, identify potential threats and formulate effective management strategies to mitigate these threats in the Andaman and Nicobar Islands.
Note: The Northern Indian Terrapin (Batagur baska) is a migrant of Turtle found in the Eastern States of India. Considering the need to revive the population of the species, A hatchery and captive breeding project was established in Sajnekhali Forest Station in the Sunderban Tiger Reserve in the State of West Bengal, India. Many individuals have been hatched and the population of the species is reviving. The Turtle Survival Alliance (TSA), in partnership with the West Bengal Forest Department, has been managing a conservation breeding program for this species within the Sunderbans Tiger Reserve. In addition, the species has also been identified as one of the 21 species for taking up Focussed recovery programme.
See:
K. Sivakumar (Ed.) 2013. Coastal and Marine Protected Areas in India: Challenges and Way Forward, ENVIS Bulletin: Wildlife & Protected Areas. Vol. 15 Wildlife Institute of India, Dehradun-248001, India. 368 pp
Sivakumar, K. (WII), Senthil Kumar, S. (IGNFA), Kumar, R.S. (WII), Ramesh, C., Adhavan, D., Hatkar, P., Bagaria, P., Kukadia, D. and Jyothi, P. 2017. Conservation Strategy and Action Plan for the Marine Turtles and their Habitats in Puducherry. Wildlife Institute of India, Dehradun. Pg. 66
Shakthi Sritharan, Muralidharan. M and Kartik Shanker, 2016. Mapping of Important Sea Turtle Nesting Sites in India. Indian Institute of Science, Bangalore and National Centre for Sustainable Coastal Management, Chennai. Final Report.
KURIAN, A. (2013) Marine turtles along the Indian coast: Distribution, status, threats and management implications. WWF India, New Delhi.
Boopendranath et al. 2006. Design and development of the TEDS for Indian fisheries. In: Sea Turtles of the Indian
Sub-continent (eds. K. Shanker & B. C. Choudhury), Universities Press, Hyderabad, India. pp 244-261.
Shanker, K. & R. Kutty (2005) Sailing the flagship fantastic: myth and reality of sea turtle conservation in India. Maritime
Studies 3(2) and 4(1): 213-240.

1.3 Programmes to correct adverse economic incentives

1.3.1 Describe any socio-economic studies or activities that have been conducted among communities that interact with marine turtles and their habitats. **[BPR, INF]**

Elaborate on the nature of the socio-economic study/ activity undertaken, the results obtained (successful or otherwise) and the desirability/ suitability for replication.
Include references to published reports, where available.
› Studies on the socio-economic impacts on fisheries communities of been initiated because of marine turtle

conservation action have been initiated and consultation with cross-sectoral agencies have been attempted (see list of reports below; available at www.dakshin.org).
Recently, IISc, Dakshin Foundation and Madras Crocodile Bank Trust with support of GIZ have jointly conducted a study on Long-term Monitoring and Community-based Conservation of Olive Ridley Turtles in Odisha. Further, under UNDP-GEF Programme of the 'Mainstreaming Biodiversity Conservation into production sector', detailed socio-economic studies have been conducted at the coasts of Godavari, Andhra Pradesh (by Wildlife Institute of India and EGREE Foundation) and at Sindhudurg coasts by Mangrove Foundation, Maharashtra.
Relevant reports :
Chandrana, R., M. Manoharakrishnan and K Shanker. Long-term Monitoring and Community-based Conservation of Olive
Ridley Turtles in Odisha. CMPA Technical Series No. 7. Indo-German Biodiversity Programme, GIZ-India, New Delhi
http://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/mainstreaming-coastal-and-marine-biodiversity-into-production-se.html

1.3.2 Which of these adverse economic incentives are underlying threats to marine turtles in your country? **[TSH]**
☑ Ease of access to the turtle ressource (e.g. by virtue of proximity or ease of land/water access)
☑ Low cost of land near nesting beaches
☑ Others (Please describe)

› Low cost of land near nesting beaches. This is an important factor given coastal development. Incentives for coastal development to industry are called special economic zones; there are large-scale incentives with large potential adverse effects on sea turtle habitats.
See :
K. Sivakumar (Ed.) 2013. Coastal and Marine Protected Areas in India: Challenges and Way Forward, ENVIS Bulletin: Wildlife & Protected Areas. Vol. 15 Wildlife Institute of India, Dehradun-248001, India. 368 pp
Rodriguez, S. 2010. Claims for Survival: Coastal Land Rights of Fishing Communities. Dakshin Foundation, Bangalore, p
42.
Sridhar, A., M. Menon, S. Rodriguez and S., Shenoy. 2008. Coastal Management Zone Notification '08 – The Last Nail in the Coffin. ATREE, Bangalore. pp 81.

1.3.3 Has your country taken any measures to try to correct these adverse economic incentives? **[BPR]**
☑ Yes (If yes, please describe these measures in detail)

› Regulations for control and management of destructive practices and activities on the nesting beaches are still under debate because coastal communities want stricter protection of the coastal resources. India has identified all important marine turtle nesting areas as 'Important Coastal and Marine Biodiversity Areas' of India and included in the 'Coastal Eco-Sensitive Zone' that gets highest priority with respect to conservation under the Indian Environment Act (CRZ Regulation). Further, India has recently initiated an innovative model of sea turtle conservation with coastal communities i.e. Incentivization of Turtle Conservation. Awareness generation programmes are carried out regularly by the respective State/Union Territory Governments along with the civil society organizations, Schools and Universities.
Fishing zone of mechanized boats has been regulated so that mechanized boats do not fish in the turtle congregation areas.

1.4 Reduction of incidental capture and mortality

1.4.1 Indicate, and describe in more detail, the main fisheries occuring in the waters of your country, as well as any high seas fisheries in which flag vessels of your country participate and interact with marine turtles.

Tick 'YES' to indicate that a fishery is present and interacting marine turtles or 'NO' to indicate that a fishery is not present or is not interacting with marine turtles. **[INF]**
If a fishery is present, use the text box to indicate, for example, the approximate geographic distribution of the fishery, how long it has been operating, how many vessels are involved, etc.

a) Shrimp trawls:
☑ Yes (Please provide details)

› Shrimp trawlers operate all along the coastline of India except for two months annually (fishing holidays). However, trawling is completely banned inside the Gahirmatha Marine Sanctuary where large number of turtles congregate for breeding. Further, TED is mandatory for trawlers that fish along Indian coast. But due to poor implementation of TED in the field, it is assumed certain numbers of the mortality of turtles along the Indian coastline is the result of incidental capture in shrimp trawls. However, comparatively the turtles mortalities related to shrimp trawling observed to be reduced all along the coasts. To minimize the marine

fisheries related mortality of Olive Ridley and other species of marine turtles, the use of Turtle Excluder Devices (TED) has been made mandatory in the States of Odisha, West Bengal and Andhra Pradesh. Acceptance of TEDs, even though provided free of cost by the Marine Product Export Development Authority (MPEDA) under the Ministry of Commerce, Government of India is improving. In the southern states, including Kerala and Tamil Nadu, there seem to be large-scale shifts away from trawling.
See :
Rodriguez, S., G. Balasubramanian, M. P. Shiny, M. Duraiswamy and P. Jaiprakash. 2008. Beyond the Tsunami: Community Perceptions of Resources, Policy and Development, Post-Tsunami Interventions and Community Institutions in Tamil Nadu, India. UNDP/UNTRS, Chennai and ATREE, Bangalore, India. p 78.

b) Set gill nets:
☑ Yes (Please provide details)

› Although capture of turtles occurs, the mortality due to use of set gill nets is not adequately investigated. However, there is a CMFRI study that documents relative mortality in gill and trawl nets. Recently, as part of CAMPA-Dugong Recovery Programme, the Wildlife Institute of India has observed the incident capture of sea turtles in gill nets in Palk Bay and Gulf of Kutch region but their number was very insignificant (3 turtles in last two years)
See :
Rajagopalan, M., E. Vivekanandan, S.K. Pillai, M. Srinath & A.B. Fernando. 1996. Incidental catch of sea turtles in India. Marine Fisheries Information Service, T & E Series 143: 8-16.
Rajagopalan, M., K. Vijayakumaran & E. Vivekanandan. 2006. Marine fishery related mortality of sea turtles in India - an overview. In: Sea Turtles of the Indian Sub-continent (eds. K. Shanker & B. C. Choudhury), Universities Press, Hyderabad, India. pp 227-237.

c) Anchored Fish Aggregating Devices (FADs):
☑ No (Please provide details)

› NOT APPLICABLE TO THE COUNTRY

d) Purse seine (with or without FADs):
☑ Yes (Please provide details)

› These are being used in Kerala, Tamil Nadu and West Bengal and there is some work on this. Not much turtle mortality is reported from these operations.

e) Longline (shallow or deepset):
☑ Yes (Please provide details)

› In surveys conducted from 2005-08, there were 19 reported instances of sea turtle interactions with the longline gear during the survey conducted in the west coast (Arabian Sea) involving 23 turtles, out of which 19 were olive ridleys, whereas two numbers each of green turtles and hawksbills were also recorded. The sea turtle HR recorded from this region was 0.068 individuals/1000 hooks, contributing 0.943% to the total catch recorded from the region. Along the west coast also, sea turtle interaction was more pronounced in the northern latitudes (lat. 15–23°N), from where 15 sea turtles were recorded, whereas the remaining 8 turtles were recorded from the southern latitudes.
In the A&N waters, instances of sea turtle interaction were meagre, the only recorded interaction being from the latitudes
12°N to 13°N (one turtle each), although extensive survey was conducted in this area during the study period. The turtle HR recorded from the A&N waters was only 0.008, and their contribution to the total catch of the region was 0.102%. Since the A&N waters are also a part of Bay of Bengal large marine ecosystem (LME), the data pertaining to these two regions were pooled together and the results showed that 64 sea turtles were recorded as bycatch from the Bay of Bengal LME, with an HR of 0.137 individuals/1000 hooks, contributing 1.769% of the total catch recorded from this LME.
Month-wise analysis of data on the sea turtles interaction revealed that along the west coast, sea turtle interaction was more during November–March, the maximum HR being recorded during March (0.175), followed by February (0.144).
Along the east coast, the seasonal variations in the sea turtle interaction were not prominent, although the number of specimens recorded varied greatly during different months. No interactions were observed during six months, viz. January, March, April, August, November and December while the catch was in the range of 1 (June) to 25 (May) during the remaining months. From the A&N waters, both the reported interactions were during January.
See :
Sijo P. Varghese*, S. Varghese and V. S. Somvanshi 2010. Impact of tuna longline fishery on the sea turtles of Indian seas. CURRENT SCIENCE, 98 (10): 1378-1384.

f) Driftnet:
☑ Yes (Please provide details)

› Since a very large number of trawl nets, gill nets etc. are discarded by marine fisheries operations; their contribution to turtle mortality is not ruled out. However, this has not been investigated in a systematic manner in the offshore waters.

g) Others (Please provide details)

› Monofilament nets used by artisanal fisherfolks within the first two km of shoreline have also been recorded to be responsible for turtle mortality. However, their contribution to turtle mortality is insignificant as the artisanal fisherfolk remove the turtles as soon as they detect a turtle to save the net.

› Dynamite fishing in coral reef harbouring areas of the country has been recorded to contribute to some level of sea turtle mortality though such fishing practices are largely targeted for fish only.

1.4.2 Please indicate the relative level of fishing effort and perceived impact of each of the above fisheries on marine turtles (e.g. in terms of by-catch) [TSH]. Select from one of the following descriptions: RELATIVELY HIGH, MODERATE, RELATIVELY LOW, NONE (i.e. not present), UNKNOWN (i.e. unable to answer for whatever reason).

a) Shrimp trawls

Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing efforts:	☐	☐	☐	☐	☑
Perceived impact:	☐	☐	☐	☐	☑

- Source of information / clarification

› Source: This varies by state/region (e.g., relatively high effort and impact on the east coast. Relatively low on west coast and negligible on the islands (A&N and Lakshadweep)).
Source : "Marine Turtles of Indian Subcontinent" edited by Kartik Shanker & BC Choudhury, 2006, Universitie Press, Hyderabad. A Publication of GOI-UNDP & Wildlife Institute of India, Dehra Dun.

b) Set gill nets

Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing effort:	☐	☐	☐	☑	☐
Perceived impact:	☐	☐	☐	☑	☐

- Source of information / clarification

› Source: This varies by state: moderate to high on the south eastern coast (Tamil Nadu), and low elsewhere. According to published papers (below), 60-70 % of the mortality is from gill nets on the east coast of India.
Source: Rajagopalan, M., E. Vivekanandan, S.K. Pillai, M. Srinath & A.B. Fernando. 1996. Incidental catch of sea turtles in
India. Marine Fisheries Information Service, T & E Series 143: 8-16.
Rajagopalan, M., K. Vijayakumaran & E. Vivekanandan. 2006. Marine fishery related mortality of sea turtles in India - an overview. In: Sea Turtles of the Indian Sub-continent (eds. K. Shanker & B. C. Choudhury), Universities Press, Hyderabad, India. pp 227-237.

c) Anchored Fish Aggregating Devices (FADs)

Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing effort:	☑	☐	☐	☐	☐
Perceived impact:	☑	☐	☐	☐	☐

- Source of information / clarification

› NOT APPLICABLE

d) Purse seine (with or without FADs)

Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing efforts:	☐	☐	☑	☐	☐
Perceived impact:	☑	☐	☐	☐	☐

- Source of information / clarification
› NOT APPLICABLE

e) Longline (shallow or deepset)
Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing effort:	☑	☐	☐	☐	☐
Perceived impact:	☐	☐	☑	☐	☐

- Source of information / clarification
› Source: Surveys conducted from 2005-2008 revealed that longline fishery is exerting an impact on the sea turtles population of the seas around India, as in the case of many longline fisheries in other parts of world. But the observed hook rate of sea turtles from the entire Indian EEZ (0.108 turtle/1000 hooks) was markedly lower than many of the studies conducted elsewhere in the world.
The study revealed that the quantum of interaction of sea turtles with longline gear varies greatly among the three regions of Indian EEZ, the greatest number of interactions and hook rate being from the east coast (Bay of Bengal,
0.302/1000 hooks) followed by west coast (Arabian Sea, 0.068/1000 hooks) whereas the least was from the A&N waters (0.008/1000 hooks). This can be attributed to the increased abundance of olive ridleys in the east coast whose main nesting ground is in the Odisha coast.
See:
Sijo P. Varghese, S. Varghese and V. S. Somvanshi 2010. Impact of tuna longline fishery on the sea turtles of Indian seas. CURRENT SCIENCE, 98 (10): 1378-1384.
Andrews, H.V., S. Krishnan & P. Biswas. 2006. Distribution and status of marine turtles in the Andaman and Nicobar Islands. In: Eds. K. Shanker & B.C. Choudhury. 2006. Marine Turtles of the Indian Subcontinent. Hyderabad, India: Universities Press. pp 33-57.

f) Driftnet
Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing effort:	☐	☐	☑	☐	☐
Perceived impact:	☐	☐	☑	☐	☐

- Source of information / clarification
› Source: Unpublished Information and Unpublished Reports.
Andrews, H.V., S. Krishnan & P. Biswas. 2006. Distribution and status of marine turtles in the Andaman and Nicobar Islands. In: Eds. K. Shanker & B.C. Choudhury. 2006. Marine Turtles of the Indian Subcontinent. Hyderabad, India: Universities Press. pp 33-57.

g) Others (from 1.4.1 g))
Please select only one per line

	UNKNOWN	NONE	RELATIVELY LOW	MODERATE	RELATIVELY HIGH
Fishing effort:	☐	☐	☐	☑	☐
Perceived impact:	☐	☐	☑	☐	☐

- Source of information / clarification

› Source: Pandav, B. & Choudhury, B.C. 2000. Conservation and Management of Olive Ridley Turtles along the Odisha Coast of India. Wildlife Institute of India, Dehra Dun, Final Report.

1.4.3 Describe any **illegal fishing** that is known to occur in or around the waters of your country that may impact marine turtles. Describe the measures being taken to deal with this problem and any difficulties encountered in this regard. **[TSH]**

› All kinds of fishing in violation of the Indian Fisheries Act as well as State Maritime Fisheries acts are controlled by the concerned state fisheries organisations. However, during the breeding season of turtles, the state wildlife department supported by the Coastal Marine Police and the Indian Coast Guard within the territorial waters and Indian Navy in the EEZ also patrol and prohibit such illegal fishing. In addition, the Forest Departments of the concerned States/Union Territories manage the designated Marine Protected Areas and also enforce the provisions of the Wild life (Protection) Act, 1972.
See:
Shanker, K. & R. Kutty (2005) Sailing the flagship fantastic: myth and reality of sea turtle conservation in India. Maritime
Studies 3(2) and 4(1): 213-240.

1.4.4 Which of the following methods are used by your country to minimise incidental capture/mortality of marine turtles in fishing activities? [IND]

a) **Appropriate handling** of incidentally caught turtles (e.g. resuscitation or release by fishersusing equipment such as de-hooking, line cutting tools and scoop nets)
☑ NO (Details/future plans)

› NOT APPLICABLE

b) **Devices that allow the escape of marine turtles** (e.g. turtle excluder devices (TEDs) or other measures that are comparable in effectiveness)
☑ YES (Details/future plans)

› But only in some (limited) areas. Although legislation exists to mandate the use of TEDs, in practice TEDs are not used.
TED promotion and implementation was started several years ago (Boopendranath et al. 2006). The Central Institute of Fisheries Technology developed a TED, and Marine Products Export Development Authority promoted its use. Awareness has been created among fishermen to use TED. Turtle mortalities due to fishing is gradually declining all along the Indian coasts.
See:
Shanker, K. & R. Kutty (2005) Sailing the flagship fantastic: myth and reality of sea turtle conservation in India. Maritime
Studies 3(2) and 4(1): 213-240.
K. Sivakumar (Ed.) 2013. Coastal and Marine Protected Areas in India: Challenges and Way Forward, ENVIS Bulletin: Wildlife & Protected Areas. Vol. 15 Wildlife Institute of India, Dehradun-248001, India. 368 pp
Gopi, G. V., B. Pandav & B. C. Choudhury. 2002. A quantitative analysis of incidental turtle mortalities during commercial shrimp trawling in the coastal waters off Odisha. Wildlife Institute of India, Dehradun. 40p

c) **Measures to avoid encirclement** of marine turtles in purse seine
☑ NO (Details/future plans)

› NOT APPLICABLE

d) **Appropriate combinations** of hook design, type of bait, depth, gear specifications and fishing practices
☑ NO (Details/future plans)

› NOT APPLICABLE

e) **Monitoring and recovery of fish aggregating devices** (FADs)
☑ NO (Details/future plans)

› NO

f) **Net retention and recycling schemes**
☑ NO (Details/future plans)

› NO

g) **Spatial and temporal control of fishing** (e.g. seasonal closures of fishing activities)
☑ YES (Details/future plans)

› There are seasonal and area bans on fishing in Odisha and a few other places for both commercial and artisanal fishers. A fishing ban during breeding season of sea turtles exists in Odisha.
See:
Flewwelling, P. and Hosch, G. 2006. Country review: India (East coast) Pp. 111-125. In: De Young, C. (ed.) Review of the state of world marine capture fisheries management: Indian Ocean. FAO Fisheries Technical Paper. No. 488. Rome, FAO.
2006. 458p.

h) **Effort management control**
☑ YES (Details/future plans)

› Gear and size restrictions are legislated. See:
Flewwelling, P. and Hosch, G. 2006. Country review: India (East coast) Pp. 111-125. In: De Young, C. (ed.) Review of the state of world marine capture fisheries management: Indian Ocean. FAO Fisheries Technical Paper. No. 488. Rome, FAO.
2006. 458p.

1.4.5 Which of the following programmes has your country developed – in consultation with the fishing industry and fisheries management organisations – to promote implementation of measures to minimise incidental capture and mortality of turtles in national waters and in the high seas? [IND]

Please use the corresponding text boxes to explain/clarify each of your responses, including 'NOT APPLICABLE' responses, and indicate future plans in this regard. [IND]
Please describe the collaboration, when/where the programmes were introduced, any difficulties encountered, and general results obtained (i.e. successful and unsuccessful). Provide references to publications, where available.

a) **Onboard observer programmes**

X
☑ YES (Details/future plans)

› The coast Guard and the Forst Department officials regularly inspect the marine waters within their jurisdiction as a part of their duties.

b) **Vessel monitoring systems**
☑ YES (Details/future plans)

› The Forest Department along with Indian Coast Guard undertake monitoring of the territorial waters.

c) **Inspections** (i.e. at sea, in port, at landing sites)
☑ YES (Details/future plans)

› Random inspections at landing sites occur for commercial and artisanal vessels, at least infrequently.
See:
Flewwelling, P. and Hosch, G. 2006. Country review: India (East coast) Pp. 111-125. In: De Young, C. (ed.) Review of the state of world marine capture fisheries management: Indian Ocean. FAO Fisheries Technical Paper. No. 488. Rome, FAO.
2006. 458p.

d) **Training programmes / workshops** to educate fishers
☑ YES (Details/future plans)

› Wildlife Institute of India and GIZ jointly developed a capacity building programme to all enforcement agencies in the country in consultation with fisheries department to conserve marine biodiversity in the country that include the minimize the mortality of sea turtles due to fishing. Further, under the CAMPA-Dugong Programme, the Wildlife Institute of India in collaboration with State Fisheries Department providing training to the Indian Coast Guard, Indian Navy and the Marine Police towards marine turtle conservation. A series of workshops and training programmes for education, awareness and training frontline staff of forest and fisheries departments in maritime states have been conducted by concerned States in collaboration with various institutions including NGOs.
Details of the work by NGOs along the coast are given in the report of the national workshop of Turtle Action Group,
2010.
See:
Sivakumar, K and Mathur, V.B., 2018. Strengthening Capacity for sustainable and Participatory Management of Coastal and Marine Protected Areas in India: Achievements in India. Wildlife Institute of India and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Dr. Neeraj Khera and Dr. K. Sivakumar, COMPENDIUM OF Training Courses on Coastal and Marine Biodiversity and Marine
Protected Areas in India, Wildlife Institute of India and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 128 pp.
Shenoy, S, N. Namboothri, T. Berlie and K. Shanker (2010) Building a network for conservation of marine turtles in India. Project report submitted to the USFWS. Ashoka Trust for Research in Ecology and the Environment, Bangalore. 57p.

e) **Informative videos, brochures, printed guidelines** etc.
☑ YES (Details/future plans)

› Bilingual video film on TED efficacy distributed in coastal fishing centres along Odisha coast. Video regarding the benefits of Square mesh net use in the Sindhudurg Coast under the GOI-UNDP-GEF Project.

- Other OR none of the above
☑ Other (list and explain):

› TED Demonstrations: TED demonstration and free distribution of TED to fisherfolks by Central Institute of Fisheries Technology, GOI-UNDP sea turtle project, MPEDA centres and maritime states fisheries departments were been conducted several years ago.
More recent efforts include the work of WWF India in Odisha, Coastal and marine biodiversity conservation works undertaken under taken in the GOI-UNDP-GEF- Mainstreaming of Coastal and Marine Biodiversity into Production Sectors in the Sindhudurg Coast, Maharashtra and the EGREE, Andhra Pradesh.

1.4.6 Are the mitigation measures described in 1.4.4 and 1.4.5 periodically reviewed and evaluated for their efficiency? **[SAP]**
☑ YES (Please give details)

› State Governments especially the Forest Departments periodically review the efficacy of mitigation measures but this review process is still needs to be strengthened at both State and Federal levels.

1.4.7 In your country, what types of data collection, research and development have been undertaken to support the reduction of marine turtle incidental catch (while taking into consideration the impact of various mitigation measures on other species)? **[SAP]**
› Forest Departments of all coastal State and Union Territories have been monitoring the sea turtle nest and mortality in collaborations with various institutions including universities and NGOs. The Central Marine Fisheries Research Institute and the Central Institute of Fisheries Technology of the Agriculture Ministry have been assigned the responsibility to monitor bycatch in various kinds of fishing practices and maintain data. The CIFT developed an indigenous TED, and conducted demonstrations in the early 2000s. In addition, there is ongoing monitoring of bycatch in general by CMFRWWF Study.
The Code of Conduct for Responsible Fisheries, which gives guidelines for sustainable development of fisheries, stresses the need for developing selective fishing gears in order to conserve resources, protect non-targeted resources and endangered species. Protection of juveniles and conservation of non-target species is therefore, imperative for balancing the ecosystem and removal of fish resources in a more sustainable manner. Under the auspices of the 'GOI-UNDP-GEF- Mainstreaming Biodiversity into production Sectors in the Sindhudurg Coast, Maharashtra' project, Square mesh net was introduced in Sindhudurg District of Maharashtra, with a view to demonstrate that biodiversity conservation of coastal areas and sustainable livelihoods can go hand in hand. Met with initial scepticism, the initiative has gone a long way in becoming something that fishermen have embraced in their journey to sustainable marine fishing. In Sindhudurg District, several trawlers have adopted more sustainable fishing practices.
Research conducted during the UNDP funded Post Tsunami Environment Initiative project also addressed bycatch in Tamil Nadu, but not on sea turtles alone. The Wildlife Institute of India has carried out national level assessment on impact of fisheries related activities on dugong and its associated species including sea turtles. As per the survey it was found that incidental capture of sea turtles have declined in India.
K. Sivakumar (Ed.) 2013. Coastal and Marine Protected Areas in India: Challenges and Way Forward, ENVIS Bulletin: Wildlife & Protected Areas. Vol. 15 Wildlife Institute of India, Dehradun-248001, India. 368 pp
Boopendranath et al. 2006. Design and development of the TEDS for Indian fisheries. In: Sea Turtles of the Indian
Sub-continent (eds. K. Shanker & B. C. Choudhury), Universities Press, Hyderabad, India. pp 244-261.
Gopi, G. V., B. Pandav & B. C. Choudhury. 2002. A quantitative analysis of incidental turtle mortalities during commercial shrimp trawling in the coastal waters off Odisha. Wildlife Institute of India, Dehradun. 40p.
Lobo, A.S., Balmford, A., Arthur, R., & Manica, A. (2010) Commercializing bycatch can push a fishery beyond economic extinction. Conservation Letters 3: 277-285.
Lobo, A.S., Santhanakrishnan, M., Iyer, V & Arthur, R. 2008. Chickenfeed: Bycatch and the economics of trawling along the Coromandel Coast. InScraping the bottom: Monitoring human impacts on benthic ecosystems of Tamil Nadu UNDP/UNTRS and NCF. Chennai. pg 6-44.
Murugan, A. and R. Durgekar. 2008. Beyond the Tsunami: Status of Fisheries in Tamil Nadu, India: A Snapshot of Present and Long-term Trends. UNDP/UNTRS, Chennai and ATREE, Bangalore, India. pp. 75.

Sivakumar, K. and Nair, A. (2013): Dugong Distribution, Habitat and Risks Due to Fisheries and Other Anthropogenic
Activities in India. Wildlife Institute of India – Technical Report. Dehradun, India. 74 pp.

1.4.8 Has your country exchanged information and provided technical assistance (formally or informally) to other Signatory States to promote the activities described in 1.4.4, 1.4.5 and 1.4.7 above? **[SAP]**
☑ YES (If yes, please give details of the exchanges/technical assistance)

› Information related to satellite tracking of sea turtles have been shared with Sri Lanka by the Wildlife Institute of India. WII
has organised a training workshop on turtle monitoring and satellite tracking of sea turtles in Sri Lanka during 2010. India is also part of the Northern Indian Ocean Marine Turtle Taskforce (NIOMTTF)
See
Sivakumar, K., B.C. Choudhury and S.R.B. Dissanayake, 2010. Joint turtle conservation programme of Sri Lanka and India: Sea turtles of Sri Lanka, also breeds in India and Maldives. Wildlife, (Journal of Department of Wildlife Conservation, Sri Lanka), June (2010):18-24.

1.4.9 What legislative and practical measures has your country taken in support of UN General Assembly Resolution 46/215 concerning the moratorium on the use of large-scale driftnets? **[SAP]**
› Large scale driftnets are not adequately known within the EEZ of India. However, the recent decision of the Agriculture
Ministry, Government of India, to open deep sea fishing may require discussion for safeguards on this subject.

1.5 Addressing harvest of, and trade in, marine turtles; and protecting of habitat

1.5.1 Does your country have legislation to prohibit direct harvest and domestic trade in marine turtles, their eggs, parts and products; and to protect important turtle habitats? **[IND]**

Please provide details (title/date) of the relevant legislation, as well as any exemptions (e.g. for traditional harvest) under that legislation.
☑ YES

› Under the Wildlife (Protection) Act, 1972, all species of marine turtles are in Schedule-I of the act and, thereby, harvest and domestic trade in any form is prohibited. Aboriginal communities in the Andaman and Nicobar Islands are exempt from the provisions of the act, but their level of take is very low.
Also there are several marine and coastal sanctuaries to protect offshore populations, and nesting and feeding habitats, including:
Gulf of Kutch Marine National Park
Gulf Of Mannar Marine National Park
Gahirmatha Marine Sanctuary and Bhitarkanika National Park (for olive ridleys)
Galathea Bay Sanctuary, Nicobar
Cuthbert Bay Sanctuary, Andaman
Many coastal sanctuaries and parks
Also, legislation banning fishing within the offshore areas of Gahirmatha, Devi and Rushikulya during the breeding season.

1.5.2 Which, among the following list, are economic uses and cultural values of marine turtles in your country? [INF]

Please rate the relative prevalence / importance of each consumptive or non-consumptive use.
Use the text boxes below each rating to explain or clarify your responses.

a1) Meat consumption
☑ YES

a2) Meat consumption: relative prevalence/importance
☑ LOW

b1) Egg consumption
☑ YES

b2) Egg consumption: relative prevalence/importance
☑ LOW

c1) Shell products
☑ YES

c2) Shell products: relative prevalence/importance

☑ LOW

d1) Fat consumption
☑ YES

d2) Fat consumption: relative prevalence/importance
☑ LOW

e1) Traditional medicine
☑ YES

e2) Traditional medicine: relative prevalence/importance
☑ LOW

f1) Eco-tourism programmes
☑ YES

f2) Eco-tourism programmes: relative prevalence/importance
☑ LOW

g1) Cultural / traditional significance
☑ YES

g2) Cultural/traditional significance: relative prevalence/importance
☑ MODERATE

1.5.3 Please indicate the relative level and impact of traditional harvest on marine turtles and their eggs. **[IND, TSH]**

	RELATIVELY HIGH	UNKNOWN	NONE	RELATIVELY LOW	MODERATE
Level of harvest:	☐	☐	☐	☑	☐
Impact of harvest:	☐	☐	☐	☑	☐

Source of information / explanation:
› The Wild Life (Protection) Act, 1972 prohibits hunting of wild animals listed in the schedules of the Act, with a exception for the Scheduled Tribes of Nicobar in the Andaman & Nicobar Islands.
Sivakumar, K. 2005. Turtles in trouble. Newsletter, WII 12(1):3-6
"Marine Turtles of Indian Subcontinent" edited by Kartik Shanker & BC Choudhury, 2006, Universitie Press, Hyderabad. A Publication of GOI-UNDP & Wildlife Institute of India, Dehra Dun.
Sivakumar, K. 2002. Turtle nesting on the south bay of Great Nicobar Island. Marine Turtle Newsletter, 96:17-18

1.5.4 Have any domestic management programmes been established to limit the levels of intentional harvest? **[SAP]**

Use the text box to give details.
☑ YES

› Yes, there are no intentional legal harvesting permitted in the country except by the Scheduled Tribes of Nicobar in the Andaman & Nicobar Islands.

1.5.5 Describe any management agreements negotiating between your country and other States in relation to sustainable levels of traditional harvest, to ensure that such harvest does not undermine conservation efforts. **[BPR]**
› None exists.

1.6 Minimizing mortality through nesting beach programmes

1.6.1 Measures and effectiveness

First, tick one of the YES/NO-boxes to indicate whether or not your country has any of the following measures in place to minimise the mortality of eggs, hatchlings and nesting females. If yes, then **estimate the relative effectiveness** of these measures. **[IND, SAP]**

Use the text boxes below each rating to elaborate on your responses, including any lessons learned that might be of value to other Signatory States, and indicate your plans for the coming year. Please explain any “Not Applicable (N/A)” responses.

a1) Monitoring/protection programmes
☑ YES

a2) Monitoring/protection programmes: relative effectiveness
☑ GOOD

b1) Education/awareness programmes
☑ YES

b2) Education/awareness programmes: Relative effectiveness
☑ GOOD

c1) Egg relocation/hatcheries
☑ YES

c2) Egg relocation/hatcheries: Relative effectiveness
☑ GOOD

d1) Predator control
☑ YES

d2) Predator control: Relative effectiveness
☑ LOW

e1) Vehicle / access restrictions
☑ YES

e2) Vehicle/access restriction: relative effectiveness
☑ GOOD

f1) **Removal of debris / clean-up**
☑ YES

f2) Removal of debris /clean-up: relative effectiveness
☑ GOOD

› Varies considerably from place to place

g1) Re-vegetation of frontal dunes
☑ NO

g2) Re-vegetation of frontal dunes: relative effectiveness
☑ UNKNOWN

h1) Building location/design regulations
☑ YES

h2) Buidling location/design regulations: relative efectiveness
☑ GOOD

› This is addressed by the Coastal Regulation Zone notification. Building location/design regulations are good. See:
Sridhar A., 2005. Statement on the CRZ Notification and Post Tsunami Rehabilitation in Tamil Nadu. UNDP Discussion
Paper, New Delhi, India.
Sridhar, A., M. Menon, S. Rodriguez and S., Shenoy. 2008. Coastal Management Zone Notification ‘08 -- The Last Nail in the
Coffin. ATREE, Bangalore. pp 81.

i1) Light pollution reduction
☑ YES

i2) Light pollution reduction: Relative effectiveness

☑ GOOD

› State Governments like Odisha have taken several steps to minimize the light pollution nearby mass nesting grounds.

j.) Other (list and rate them)
› Not Applicable

1.6.2 Has your country undertaken any evaluation of its nest and beach management programmes? **[SAP]**

Use the text box to elaborate on your response, if necessary.
☑ YES

› Yes. the Ministry of Environment, Forest and Climate Change, Government of India conduct annual review of all turtle management programms that have been supported by the Ministry. Further, Turtle Action Group (a national network of organisation working on sea turtles) conducts an annual workshop.
Shenoy, S, N. Namboothri, T. Berlie and K. Shanker (2010) Building a network for conservation of marine turtles in India. Project report submitted to the USFWS. Ashoka Trust for Research in Ecology and the Environment, Bangalore. 57p.

OBJECTIVE II: PROTECT, CONSERVE AND REHABILITATE MARINE TURTLE HABITATS

2.1 Measures to protect and conserve marine turtle habitats

2.1.1 What is being done to protect critical habitats outside of established protected areas? (NB: It is assumed that legislation relating to established protected areas will have been described in Section 1.5.1) **[BPR, SAP]**

› All important turtle nesting beaches that are outside the established PAs have been under the governance of the Coastal Zone Regulation of Government of India. CRZ regulates and minimize anthropogenic activities on these beaches and also provides protection from various anthropogenic pressures. Further, Wildlife Institute of India has identified about 15 turtle nesting beaches along the peninsular India as Important Coastal and Marine Biodiversity Areas and these ICMBAs have been included in the 'Eco-sensitive Zones' under the Environment Protection Act for priority conservation as well as sustainable management. Further, the Indian Institute of Science has also identified about 300 turtles nesting sites and recommended to be part of the Eco-sensitive zones. The coastal waters of Odisha -- particularly the river mouth of Dhamra, Mahanadi, Devi, Chilka and Rushikulya -- have been declared as no fishing zone during turtle breeding season. Also the onshore habitat at mass nesting sites have been protected by the forest department from predation and other beach related casualty of turtles.
Offshore congregation protection is specific to Odisha and was carried out for a few years by the Forest Department in collaboration with a NGO initiative (Operation Kachhapa), but is currently not very rigorous. Lack of resources, capacity, and collaboration between the Forest and Fisheries Departments are the main reasons.
There are NGOs working in almost every single state in India, some of which are listed below. The work of these organisations is critical for the conservation of sea turtles outside protected areas. The near complete list of NGOs are available at Dr. Neeraj Khera and Dr. K. Sivakumar, COMPENDIUM OF Training Courses on Coastal and Marine Biodiversity and Marine Protected Areas in India, Wildlife Institute of India and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 128 pp.
Andaman and Nicobar Islands Environmental Team (ANET): Port Blair, Andaman Islands
Bombay Natural History Society, Shaheed Bhagat Singh Road, Mumbai, India.
Canara Green Academy: Sirsi, Karnataka
Dakshin Foundation, Bangalore
Field Services and Intercultural Learning (FSL): Kundapur, Karnataka
Green Life Rural Association (GLRA): Puri dist., Odisha
Green Mercy: Srikakulam, Andhra Pradesh
Lakshadweep Marine Research and Conservation Centre (LMRCC): Kavarathi Island, Lakshadweep
Madras Crocodile Bank Trust: Mamallapuram, Tamil Nadu
Mangrove and marine Biodiversity Conservation Foundation, Maharashtra, Mumbai
Naithal (Coastal Information Conservation and Action): Kasargod, Kerala
OMCAR Foundation, Palk Bay, Tamil Nadu
Podampeta Ecotourism and Olive Ridley Protection Club: Ganjam dist., Odisha Rushikulya Sea Turtle Protection Committee: Ganjam dist., Odisha
Sahyadri Nisarga Mitra: Chiplun, Maharashtra
Sea Turtle Action Project: Puri dist., Odisha
Students' Sea Turtle Conservation Network (SSTCN): Chennai, Tamil Nadu
Theeram Prakriti Samrakshana Samiti: Kolavipalam, Kerala
Trust for Environment Education (TREE) Foundation: Chennai, Tamil Nadu
Visakha Society for Prevention of Cruelty to Animals (VSPCA): Visakhapatnam, Andhra Pradesh
Wildlife Society of Odisha: Cuttack, Odisha
WWF-India, Lodhi Estate, New Delhi
Wildlife Trust of India, NOIDA, Uttar Pradesh, India.

2.1.2 Are assessments routinely made of the environmental impact of marine and coastal development on marine turtles and their habitats? **[IND, SAP]**

Use the text box to elaborate on your response.
☑ YES

› All onshore and offshore developmental projects along the coastline of India are required to conduct EIA studies and develop environmental management plans before obtaining formal approval of the MoEFCC

2.1.3 Is marine water quality (including marine debris) monitoring near turtle habitats? If yes, describe the nature of this monitoring and any remedial measures that may have been taken. **[SAP]**
☑ YES

› As part of UNDP-GEF 'Mainstreaming Biodiversity Conservation into production sector' water quality was monitored in Godavari and Sindhudurg coasts and manage the pollution in the region. Further, Wildlife

Institute of India has been monitoring the water quality of Gulf of Kutch, Gulf of Mannar, Palk Bay and Andaman and Nicobar Islands to take appropriate if management interventions if required. Moreover, NIOT and NCSCM have also monitoring the water qualities at important marine biodiversity areas of the country. State Pollution Control Boards of all coastal states as well as several research institutions have been monitoring the water quality along the coasts that include sea turtle habitat.
Apart from fishing-related casualty, marine debris and coastal water pollution being a contributing factor for sea turtle well being, nongovernmental organisations have taken up onshore debris clearance prior to nesting season in some areas.

2.1.4 Are measures in place to prohibit the use of poisonous chemicals and explosives? **[SAP]**

Use the text box to elaborate on your response.
☑ YES

› Under the Central Pollution Control Board and under the Wild Life (Protection) Act, 1972, as well as the Indian Coast Guard's mandate, relevant acts have been promulgated. However, levels of enforcement and compliance are unknown.

2.2 Rehabilitation of degraded marine turtle habitats

2.2.1 Are efforts being made to recover degraded coral reefs? If yes, give details (location, duration, effectveness, lessons learned, future plans etc.). **[IND, SAP]**

Provide sufficient details of the measures taken, especially those measures shown to have been effective in recovering degraded coral reefs. Please indicate future plans in this regard.
☑ YES (Details/future plans)

› Coral reef restoration projects are currently in operation in the Gulf of Mannar, Gulf of Katchchh, and Lakshadweep islands of India. Some attempts of onshore nesting habitat restoration have been in progress in Andaman & Nicobar islands.
Zoological Survey of India of the Ministry of Environment, Forests and Climate Change, and NGOs such as Wildlife Trust of
India and SDMRI are being involved in the coral restoration programs in India. Coral reef rehabilitation project was undertaken in the Malvan region of Sindhudurg Coast by the Zoological Survey of India under the GOI-GEF-UNDP- Project. Further, coral rehabilitation programme has also been undertaken along the Gujarat coast under the ICZM Project.
Background information and further details can be found in:
Sampath, V. (2003). NATIONAL REPORT on the Status and Development Potential of the Coastal and Marine Environment
of the East Coast of India and its Living Resources.
Pernetta, J.C. (Ed). 1993. Marine Protected Area Needs in the South Asian Seas Region. Volume 2: India. A Marine
Conservation and Development Report. IUCN, Gland, Switzerland. vii+ 77pp.

2.2.2 Are efforts being made to recover degraded mangrove habitats that are important for turtles? If yes, give details (location, duration, effectiveness, lessons learned future plans etc.). **[IND, SAP]**
☑ YES (Details/future plans)

› Under the MoEFCC's Mangrove and Coral Reef programme, a national mangrove conservation programme is in operation. Thirty five locations along the coastline have been identified and supported under the Mangrove Restoration project. A further impetus to mangrove restoration have also been given after the post tsunami reconstruction programme and launching of the Mangroves for the Future project (MFF) of the IUCN. Further, through ICZM and UNDP-GEF Marine Programs the mangrove restoration programs in India is being strengthened in the recent past. The Ministry of Environment, Forest and Climate Change, Government of India has been providing financial assistance to the States/Union territory Government for protection and conservation of Mangroves and coral reefs. Focussed financial assistance is also provided for management of Protected Areas which also include conservation of mangroves and coral reefs.
Background information and further details can be found in:
Sampath, V. (2003). NATIONAL REPORT on the Status and Development Potential of the Coastal and Marine Environment
of the East Coast of India and its Living Resources.
Pernetta, J.C. (Ed). 1993. Marine Protected Area Needs in the South Asian Seas Region. Volume 2: India. A Marine
Conservation and Development Report. IUCN, Gland, Switzerland. vii+ 77pp.

2.2.3 Are efforts being made to recover degraded sea grass habitats? If yes, give details (location, duration, effectiveness, lessons learned future plans etc.). **[IND, SAP]**
☑ YES (Details/future plans)

› Only in the Gulf of Mannar, Gulf of Kachchh, Andaman & Nicobar and Lakshaweep islands of India by establishing Marine Protected Areas. However, there was no any other efforts to restore sea grass beds that have already been degraded except protecting these habitats. The Government of India is also implementing a focussed programme for conservation of Dugongs and its habitats and under this project marine biodiversity conservation including marine turtle conservation is also considered A similar study has also been undertaken in the State of Tamil Nadu under the World Bank Project.
Background information and further details can be found in:
Sampath, V. (2003). NATIONAL REPORT on the Status and Development Potential of the Coastal and Marine Environment of the East Coast of India and its Living Resources.
Pernetta, J.C. (Ed). 1993. Marine Protected Area Needs in the South Asian Seas Region. Volume 2: India. A Marine
Conservation and Development Report. IUCN, Gland, Switzerland. vii+ 77pp.

OBJECTIVE III: IMPROVE UNDERSTANDING OF MARINE TURTLE ECOLOGY AND POPULATIONS THROUGH RESEARCH, MONITORING AND INFORMATION EXCHANGE

3.1 Studies on marine turtles and their habitats

3.1.1 Give a list of available literature that includes baseline information from studies carried out in your country on marine turtle populations and their habitats. **[INF]**

› Important Literature includes:

BHASKAR, S. 1978. Notes from Gulf of Kutchh. Hamadryad . 3(3) 9-10.

BHASKAR, S. 1979a. Preliminary Report on Sea Turtles in the Gulf of Kutch. Marine Turtle Newsletter 11:3-4.

BHASKAR, S. 1979b. Sea turtle survey in the Andaman and Nicobars. Hamadryad , 4(3), 2-26.

BHASKAR, S. 1982. Sea turtles of Suheli island. Hamadryad 7(3): 22. BHASKAR, S. 1982. Turtle tracking in Gujarat. Hamadryad 7(1) 13-14.

BHASKAR, S. 1984a. Preliminary Report on Sea Turtles in the Gulf of Kutch, Marine Turtle Newsletter 11: 3-4.

BHASKAR, S. 1984b. Marine Turtles in India's Lakshadweep Islands, Marine Turtle Newsletter 8:5

BHASKAR, S. 1984c. The distribution and status of sea turtles in India. Pp. 21-35. In: E. G. Silas (Ed.) Proceedings of the
Workshop on sea turtle conservation. CMFRI Special Publication No. 18, 119 p.

Behera, S., Basudev Tripathy, K. Sivakumar, B. C. Choudhury, S. K. Dutta, and Bivash Pandav, 2018. Nesting Space Dynamics and Its Relationship with the Arribada of Olive Ridley Turtles at Gahirmatha Rookery, East Coast of India. Journal of Herpetology, 52(4):381-386.

Behera, S., Basudev Tripathy, Binod Chandra Choudhury and Kupuswamy Sivakumar, 2018. Movements of Olive Ridley Turtles (Lepidochelys olivacea) in the Bay of Bengal, India, Determined via Satellite Telemetry. Chelonian Conservation and Biology, 2018, 17(1).

Behera, S.,Basudev Tripathy, K. Sivakumar, Binod C. Choudhury & Bivash Pandav. 2016. Fisheries impact on breeding of olive ridley turtles (Lepidochelys olivacea) along the Gahirmatha coast, Bay of Bengal, Odisha, India. Herpetological Journal, Volume 26 (April 2016), 93–98. doi:10.2744/CCB-1245.1

Subrata K. Behera, K. Sivakumar, B. C. Choudhury and Sajan John, 2014. Diet Preference and Prey of Olive Ridley Turtles (Lepidocheyls olivacea) along East Coast of India, Odisha. Open Journal of Ocean and Coastal Sciences, 1(1): 72-83.

Behera Kumar S. K., Kar C. S., K. Sivakumar and Choudhury B. C, 2014. Nesting Ridleys Need Critical Protection and Its High Nest Successes at Devi Coast Odisha. Open Journal of Ocean and Coastal Sciences, 1(1): 25-34.

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Also:
http://www.seaturtle.org/iotn/bib_Odisha.html

3.1.2 Have **long-term** monitoring programmes (i.e. of at least 10 years duration) been initiated or planned for priority marine turtle populations frequenting the territory of your country? **[IND, BPR]**

Please give details of the nature, duration and continuity of these programmes.
☑ YES

› The Government of Odisha has a full fledged operational unit for monitoring olive ridley turtle populations along the Odisha coast under its state forest department. For other population the monitoring work is taken up on an annual basis by the state wildlife management agencies and or research institutions.
State Forest Departments such as Andhra Pradesh (Godavari mouth), Tamil Nadu (Point Calimere/Gulf of Mannar), Gujarat (Porbandar coasts), Andaman and Nicobar Islands (Galathea, Cuthbert Bay, etc) have been monitoring the nesting population of sea turtles.
The Government of India is also contemplating a National Marine Turtle Conservation Action Plan.
Several NGOs have monitoring programmes that have lasted well beyond 10 years; for example: Students Sea Turtle Conservation Network. Chennai – 1988 to present
Andaman and Nicobar Environmental Team, Andamans – 2000 to present
Several states have NGO based monitoring programmes that are more than 5 years old.

3.1.3 Has the genetic identity of marine turtle populations in your country been characterised? **[INF, PRI]**

Please give details (e.g. which species, which populations?).
☑ YES

› Populations on the east coast of India were studied. See:
• Shanker, K., J. Rama Devi, B.C. Choudhury, L. Singh & R.K. Aggarwal (2004) Phylogeography of olive ridley turtles
(Lepidochelys olivacea) on the east coast of India: implications for conservation theory. Molecular Ecology 13: 1899-1909.
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The study shows that the olive ridley population on the east coast of India is unique and ancestral to olive ridleys in the
Atlantic and Pacific Oceans.
Under a research project of the Wildlife Institute of India and Centre for Cellular and Molecular Biology, a project has collected tissue and blood samples of all species and a preliminary progress report is available. However, the complete report of this project is yet to be finalised.
There is an ongoing project on sea turtle genetics at the Indian Institute of Science, Bangalore.

3.1.4 Which of the following methods have been or are being used to try to identify migration routes of turtles? Use the text boxes to provide additional details [INF, PRI]

a) Tagging
☑ YES (Details/future plans)

› The Odisha Forest Department initiated a tagging programme in 1980's and thereafter the CMFRI tagged nearly 500 turtles in Odisha. More recently, around 10,000 nesting olive ridley turtles and 1600 mating pairs were tagged during 1996-1999 by the Wildlife Institute of India along the Odisha coast and tag returns have been received from many parts of Sri Lanka and all along the east coast of India. Similar tagging programmes were also carried out in Andaman & Nicobar, Lakshadweep and Tamil Nadu.
See:
• Tripathy, B. and Pandav, B (2007) Beach fidelity and internesting movements of olive ridley turtles (Lepidochelys olivacea)

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• Andrews, H.V., S. Krishnan & P. Biswas. 2006. Distribution and status of marine turtles in the Andaman and Nicobar Islands. In: Eds. K. Shanker & B.C. Choudhury. 2006. Marine Turtles of the Indian Subcontinent. Hyderabad, India: Universities Press. pp 33-57.

b) Satellite tracking
☑ YES (Details/future plans)

› In 2001, four female olive ridley turtles were deployed with PTTs along Odisha coast. Thereafter again in 2007, 32 female olive ridley turtles were fitted with PTTs to study the migration and movement along the east coast of India. The results of both the satellite telemetry studies suggest that sea turtle migrate at least up to southern Sri Lanka. Additional transmitters have since been deployed, bringing the total number of olive ridleys tagged as part of this project to 60-70 (number to be confirmed). See also the IOSEA Satellite Tracking Metadatabase for details: http://ioseaturtles.org/satellite_tracking.php
Olive ridleys and one green turtle have been tagged by TREE Foundation on the southeastern coast of India. Three leatherback turtles have been tagged by the Indian Institute of Science and Andaman and Nicobar Environmental
Team on Little Andaman Island in January 2011.

c) Other OR None of the above
☑ Other (List and provide details)

› The Madras Crocodile Bank Trust and the Andaman Nicobar Environmental Team monitored the nesting population of leatherback turtles using PIT tags at Galathea, Great Nicobar Island from 2000-2002.
The Indian Institute of Science and Andaman and Nicobar Environmental Team have been monitoring the nesting population of leatherback turtles using PIT tags on Little Andaman Island in January 2011.
Andrews, H.V., S. Krishnan & P. Biswas. 2006. Distribution and status of marine turtles in the Andaman and Nicobar Islands. In: Eds. K. Shanker & B.C. Choudhury. 2006. Marine Turtles of the Indian Subcontinent. Hyderabad, India: Universities Press. pp 33-57.

3.1.5 Have studies been carried out on marine turtle population dynamics and survival rates (e.g. including studies into the survival rates of incidentally caught and released turtles)? **[INF, PRI]**
☑ YES

› Yes, several studies have been carried out on olive ridley population dynamics along the Odisha coast. However, no specific studies have been conducted into the survival rates of incidentally caught and released turtles as no such programme for reviving comatose turtles in incidental captures are in operation.
For a review, see:
Shanker, K., B. Pandav & B.C. Choudhury (2004). An assessment of the olive ridley turtles (Lepidochelys olivacea) nesting population in Odisha, India. Biological Conservation 115: 149 – 160.

3.1.6 Has research been conducted on the frequency and pathology of diseases in marine turtles? **[INF, PRI]**
☑ UNSURE

3.1.7 Is the use of traditional ecological knowledge in research studies being promoted? **[BPR, PRI]**
☑ YES

› The traditional capture methods have been employed by field researchers for capturing turtle to be tagged and or
deployment of satellite transmitters.

3.2 Collaborative research and monitoring

- 3.2.1 List any **regional** or **sub-regional action plans** in which your country is already participating, which may serve the purpose of identifying priority research and monitoring needs. **[INF]**

Use the text box to elaborate on your response.
› There is no sub-regional forum action plan in which India has participated. However, India has a trans-boundary protected area management initiative in which mechanisms are under development between India-Bangladesh, India-Sri Lanka and India-Pakistan with respect to marine fauna in contiguous protected areas.
India is also part of the Northern Indian Ocean Marine Turtle Task Force (NIOMTTF) under the IOSEA.
See
Sivakumar, K., B.C. Choudhury and S.R.B. Dissanayake, 2010. Joint turtle conservation programme of Sri Lanka and India: Sea turtles of Sri Lanka, also breeds in India and Maldives. Wildlife, (Journal of Department of Wildlife Conservation, Sri Lanka), June (2010):18-24.

3.2.2 On which of the following themes have collaborative studies and monitoring

been conducted? Use the text boxes to describe the nature of this international collaboration or to clarify your response. Answer 'NO' if the studies/monitoring undertaken do not involve international collaboration. [INF, PRI]

a) Genetic identity
☑ NO (Details/future plans)

b) Conservation status
☑ NO (Details/future plans)

c) Migrations
☑ YES (Details/future plans)

› Collaborative study on "satellite telemetry on olive ridley sea turtles along Odisha coast and Sri Lanka" by Wildlife Institute of India.
Sivakumar, K., B.C. Choudhury and S.R.B. Dissanayake, 2010. Joint turtle conservation programme of Sri Lanka and India: Sea turtles of Sri Lanka, also breeds in India and Maldives. Wildlife, (Journal of Department of Wildlife Conservation, Sri Lanka), June (2010):18-24.

d) Other biological and ecological aspects
☑ YES (Details/future plans)

› Nature Conservation Foundation – ongoing project on foraging of green turtles in the Lakshadweep
Lal, A., Arthur, R., Marba, N., Lill, A. and Alcoverro, T,. (2010). Implications of conserving an ecosystem modifier: Increasing green turtle (Chelonia mydas) densities substantially alters seagrass meadows. Biological Conservation 143.

3.3 Data analysis and applied research

3.3.1 List, in order of priority, the marine turtle populations in your country in need of conservation actions, and indicate their population trends. **[PRI]**
› 1. Olive ridley turtle in Odisha - Curtailing fisheries related mortality and safeguarding arribada population and developmental activities on the vicinity of congregation site and monitoring of population trends are the priority.
2. Leatherback turtle in the Andaman and Nicobar Islands - Current data shows the recovery of nesting beaches in the Nicobar Islands. Currently, ANET and IISc are monitoring beaches on Little Andaman Island on a regular basis.
3. Hawksbill turtle in the Andaman and Nicobar Islands - Population status is a priority. [But see Bhaskar, S. 1996. Re-nesting intervals of the hawksbill turtle (Eretmochelys imbricata) on south Reef Island, Andaman Islands, India. Hamadryad 21: 19-22.]
4. Green turtle in Gujarat, Lakshadweep and Andaman Islands. Population status not known. Assessment and monitoring are a priority.

3.3.2 Are research and monitoring activities, such as those described above in Section 3.1, periodically reviewed and evaluated for their efficacy? **[SAP]**
☑ YES

› The Respective State/Union Territory Governments undertake review. The Government of India also provides financial assistance for review of Protected Areas.

3.3.3 Describe how research results are being applied to improve management practices and mitigation of threats (in relation to the priority populations identified in 3.3.1, among others). **[SAP]**
› i. The offshore congregation monitoring of olive ridley turtles has helped in deployment of offshore patrolling vessels in
Odisha for minimizing fisheries interface.
ii. Sporadic nesting monitoring of olive ridleys and other species along the Indian coast has helped the management to setup beach hatcheries as well as in situ protection of nests from predators.

3.4 Information exchange

3.4.1 Has your country undertaken any initiatives (nationally or through collaboration with other Range States) to standardise methods and levels of data collection? **[BPR, INF]**
☑ YES [If yes, please give details of the agreed protocol(s)]

› As part of GOI-UNDP sea turtle project, four user-friendly manuals have been published which are not only used by the
frontline staff in India but also in the neighboring countries. In addition, under a Government of India funded project for conservation of Dugongs, a Marine Sea Turtle friendly Action Plan has been prepared and has been

shared with the CMS Dugong Secretariat.
• Shanker, K., B.C. Choudhury & H.A. Andrews (2003) Sea turtle conservation: Beach Management and hatchery programmes. Centre for Herpetology/Madras Crocodile Bank Trust, Tamil Nadu, India.
• Shanker, K., B. Pandav & H.A. Andrews (2003) Sea turtle conservation: Research and management techniques. Centre
for Herpetology/Madras Crocodile Bank Trust, Tamil Nadu, India.
• Shanker, K., B. Pandav & B.C. Choudhury (2003) Sea turtle conservation: Population Monitoring and Census. Centre for
Herpetology/Madras Crocodile Bank Trust, Tamil Nadu, India.
• Choudhury, B.C., Tripathy, B. and H.V. Andrews (2003) Sea turtle conservation: Eco (turtle) friendly coastal development. Centre for Herpetology/Madras Crocodile Bank Trust, Tamil Nadu, India.
Ashoka Trust for Research in Ecology and Environment and Southeastern Louisiana University collaborated to standardize mass nesting census in India, Mexico and Costa Rica. The following manual was developed:
• Shanker, K., B.C. Choudhury & C.S. Kar (2010) Census techniques for arribadas. ATREE, Bangalore and Marine Turtle
Conservation Act Fund, USFWS.

3.4.2 To what extent does your country exchange scientific and technical information and expertise with other Range States? **[SAP, IND]**
☑ OCCASIONALLY

3.4.3 If your country shares scientific and technical information and expertise with other Range States, what mechanisms have commonly been used for this purpose? Comment on any positive benefits/outcomes achieved through these interactions. **[INF]**
› The exchange is only at scientific and academic level through sharing of published literature and newsletter (such as IOTN). The Indian Ocean Turtle Newsletter reaches over 1500 readers in the Indian Ocean and Southeast Asia.

3.4.4 Does your country compile and make available to other countries data on marine turtle populations of a regional interest?

Please give details **[INF]**
☑ YES

› This will be made available through a collaboration between SWOT and TAG (turtle action group – India) and www.seaturtlesofindia.org

OBJECTIVE IV: INCREASE PUBLIC AWARENESS OF THE THREATS TO MARINE TURTLES AND THEIR HABITATS, AND ENHANCE PUBLIC PARTICIPATION IN CONSERVATION ACTIVITIES

4.1 Public education and information programmes

4.1.1 Describe the educational materials, including mass media information programmes that your country has collected, developed and/or disseminated. **[INF, PRI]**

Details/future plans:
› Awareness programs are the strength of state Forest Department to get the supports of communities in turtle conservation. All coastal States and UTs of India give more attention to this programs that include 'Street Drama, Nature camps, etc'.
Some of Educational and awareness materials;
1. A book on "Marine Turtles of Indian Subcontinent" edited by Kartik Shanker and BC Choudhury and published as an outcome of GOI-UNDP and WII study by Universities Press, India.
2. Sea Turtle Research, Management and Conservation Manuals published by Wildlife Institute of India and Madras
Crocodile Bank Trust.
3. A documentary on sea turtle-fisheries interface with special emphasis on TED efficacy produced as part of GOI-UNDP Sea Turtle Project for popularisation of TED.
4. Sea turtle resource book for teachers was published by Centre for Environmental Education, Ahmedabad.
5. Posters and brochures on marine turtles of India have been prepared by various national and local NGOs, as well as
Forest Departments (see list of NGOs earlier)
6. A manual on Odisha Marine Conservation Laws (English, Oriya) by ATREE, Bangalore
7. CD on TED efficacy by GOI-UNDP sea turtle project.
8. 'Turtle Story', a children's book published by ATREE and Pratham Books, Bangalore (Available in English, Hindi, Kannada, Marathi, Tamil, Telugu, Urdu, Gujarati, Oriya)
9. Posters on fishing regulations in Rushikulya, Gahirmatha and Devi, Odisha by ATREE, Bangalore.
10. 'Riddle of the Ridley' (2006). Written by Shekar Dattatri, distributed by Tulika books. (Available in English, Hindi, Oriya and Tamil).
11. 'Turtle Telemetry' – A short training video for Wildlife Institute of India on fitting radio transmitters on olive ridley sea turtles. (2002). Produced and written by Shekar Dattatri.
12. 'The Ridley's Last Stand' a self-financed production for conservation awareness, on why 15,000 olive ridley sea turtles are dying in Odisha, on the east coast of India, every year, and what can be done to stop this. (2001). Produced and written by Shekar Dattatri.
13. 'Right to survive: Turtle conservation and fisheries livelihoods'. A film produced by the International Collective in
Support of Fishworkers (ICSF), Chennai.
14. 'INDIAN OCEAN TURTLE NEWSLETTER' – Nearly 1000 copies of the newsletter are distributed throughout India to a wide range of stakeholders including government and NGOs. SEA TURTLES OF INDIA WEBSITE (www.seaturtlesofindia.org) – the website provides information on sea turtles in India, and provides other online resources (maps, publications, manuals) to users.
15. Recently, UNDP-GEF Marine Program in East Godavari and Sindhudurg coasts published series of nature education awareness materials related to sea turtles and other coastal fauna and flora.
16. Wildlife Institute of India has developed various awareness materials under the CAMPA-Dugong Recovery Programme that promote sea turtles conservation among local communities in Gulf of Mannar, Palk Bay, Gulf of Kutch and Andamna and Nicobar islands.
PDF copies are made available freely online through the website mentioned above.

4.1.2 Which of the following groups have been the targets of these focused education and awareness programmes described in above in Section 4.1.1? **[PRI, INF]**
☑ Policy makers
☑ Fishing industry
☑ Local/Fishing communities
☑ Indigenous groups
☑ Tourists
☑ Media
☑ Teachers
☑ Students
☑ Military, Navy, Police
☑ Scientists
☑ Additional information

› Shenoy, S, N. Namboothri, T. Berlie and K. Shanker (2010) Building a network for conservation of marine

turtles in India. Project report submitted to the USFWS. Ashoka Trust for Research in Ecology and the Environment, Bangalore. 57p.

4.1.3 Have any community learning / information centres been established in your country? **[BPR, SAP]**

Please give details and indicate future plans
☑ YES

› Fishing communities and conservation groups have formed the Odisha Marine Resources Conservation Consortium
(OMRCC) to provide a platform for dialogue and collaborative action.
Several Eco-development Committees in Gulf of Mannar region have been engaged in community learning.

4.2 Alternative livelihoods opportunitiesDescribe initiatives already undertaken or planned to identify and facilitate alternative livelihoods (including income-generating activities) for local communities. **[IND, BPR]**
› Dugong Volunteer Network in Tamil Nadu and Turtle Volunteer Network in Maharashtra have also been formed.
The WWF-India has initiated a programme to promote bycatch reduction in marine fisheries to artisanal fisherfolk impacted by protection oriented marine turtle conservation programmes.
Many of the NGOS working on sea turtle conservation (listed in Section 2.1.1) have direct or indirect projects on alternate livelihoods.
As a large scale initiative, the Odisha Marine Resources Conservation Consortium (OMRCC) in Odisha has the mandate of addressing issues relating to alternate livelihoods. With funding from Ford Foundation, the OMRCC has been working on projects related to providing alternate livelihoods, particularly in southern Odisha.

4.3 Stakeholder participation

4.3.1 Describe initiatives already undertaken or planned by your country to involve **local communities**, in particular, in the planning and implementation of marine turtle conservation programmes. Please include details of any incentives that have been used to encourage public participation, and indicate their efficacy. **[BPR, IND]**
› On the west coast of India, local NGOs in Kerala (THEERAM), Karnataka (Canara Green Academy), Maharashtra (Sahyadri Nisarga Mitra) and Gujurat (Prakruti Nature Club) have initiated community involved nest protection and hatchery management programmes as well as interaction with tourists.
Similarly along east coast of India several NGOs involve or were formed by local communities: e.g. in Tamil Nadu (TREE Foundation) and Odisha (RSTPC, APOWA, STAP, GLRA). The Government of Odisha also involves local fishing communities in collection of degraded nests, participation in arribada censuses, and safe release of disoriented hatchlings on mass nesting beaches.
Dakshin Foundation and the Madras Crocodile Bank Trust, with funding support from the USFWS Marine Turtle Conservation Fund, have facilitated a national level network of turtle conservation groups called the ‘Turtle Action Group’, constituted of local and community-based organisations from across the Indian coastline. Under the various activities of the projects, publication of outreach and education material is produced, translated and distributed to member organisations for their individual outreach and awareness programmes. The programme also makes available small grants to member organisations to carry out monitoring and data collection, preparation of management plans, etc. The Turtle Action Group has is also now a contributor to the SWOT (State of the World’s Sea Turtles) database.
See:
Shenoy, S, N. Namboothri, T. Berlie and K. Shanker (2010) Building a network for conservation of marine turtles in India. Project report submitted to the USFWS. Ashoka Trust for Research in Ecology and the Environment, Bangalore. 57p.

4.3.2 Describe initiatives already undertaken or planned to involve and encourage the cooperation of **Government institutions, NGOs** and the **private sector** in marine turtle conservation programmes. **[IND, BPR]**
› The 30th Annual Symposium on Sea Turtle Biology and Conservation was held in Goa, India, in April 2010. It was held in the South Asian region for the first time, it had 500 participants from more than 50 countries across the world. Several training workshops (statistics, stable isotopes, rehabilitation, marine invasives, etc) were held as part of the symposium.
A National Marine Turtle Action Plan and a National Task Force for Marine Turtle Conservation are being contemplated.

OBJECTIVE V: ENHANCE NATIONAL, REGIONAL AND INTERNATIONAL COOPERATION

5.1 Collaboration with, and assistance to, signatory and non-signatory States

5.1.1 Has your country undertaken a national review of its compliance with Convention on International Trade in Endangered Species (CITES) obligations in relation to marine turtles? **[SAP]**
☑ YES (If yes, please elaborate briefly)

› India is a signatory nation to the CITES and in consonance with the marine turtles in CITES appendices, India has placed
all species of marine turtles in the Schedule I of the Wildlife (Protection) Act, 1972 to curtail illegal capture of turtles in the offshore and onshore areas.

5.1.2 Does your country have, or participate/cooperate in, CITES training programmes for relevant authorities? **[SAP]**
☑ YES (If yes, please provide details of these training programmes)

› Whenever and wherever CITES organises training programmes, enforcement officials of Government of India and coastal states participate. Scientific Authorities of India of CITES such as Wildlife Institute of India and IFGTB have already organized CITES training programs in India.

5.1.3 Does your country have in place mechanisms to identify **international** illegal trade routes (for marine turtle products etc.)? Please use the text box to elaborate on how your country is cooperating with other States to prevent/deter/eliminate illegal trade. **[SAP]**

Please give details of particularly successful interventions and prosecutions; and/or mention any difficulties experienced that impede progress in this area. Please provide references to any published reports (e.g. already prepared for CITES purposes) that give a more ample explanation.
☑ YES

› The MoEFCC, Govt. of India has established CITES management authorities regional offices with complimentary staff to monitor illegal trade involving all CITES and IWP scheduled species. Further, recently has established the National Wildlife Crime Control Bureau (NWCCB) with regional offices to collect intelligence information on wildlife trade and to train frontline trans-border enforcement officials.
Further, TRAFFIC-India has also been monitoring illegal trade on protected species including sea turtles. See: Sajan JOHN, Mutyam Praveen Kumar BATU, Sivakumar KUPPUSAMY, Binod Chandra CHOUDHURY, 2012. An Assessment
of Legally Protected Marine Fauna in Curio Trade – A Market Study from Tamil Nadu, India. International Journal of
Conservation Science, 3(3): 217-230

5.1.4 Which international compliance and trade issues related to marine turtles has your country raised for discussion (e.g. through the IOSEA MoU Secretariat, at meetings of Signatory States etc.)? **[INF]**
› NOT APPLICABLE

5.1.5 Describe measures in place to prevent, deter and eliminate domestic illegal trade in marine turtle products, particularly with a view to enforcing the legislation identified in Section 1.5.1**. [INF]**
› The Wildlife (Protection) Act, 1972 of the Union Government of India, State/UT Enforcement agencies

5.2 Prioritisation, development and implementation of national action plans

5.2.1 Has your country already developed a national **action plan** or a set of **key management measures** that could eventually serve as a basis for a more specific action plan at a national level? **[IND]**

Please explain.
☑ YES

› The MoEFCC, Govt. of India launched the national sea turtle conservation programme through the UNDP supported GOI-UNDP sea turtle project. This project identified the threats and management strategies, guidelines and action plans which the maritime states, with support from the Government of India, implement.
A National Marine Turtle Action Plan and a National Task Force for Marine Turtle Conservation are being contemplated.

5.2.2 From your country's perspective, which **conservation and management activities**, and/or which particular **sites or locations**, ought to be among the highest priorities for action?
(List up to 10 activities from the IOSEA Conservation and Management Plan). **[PRI]**

› Use of TED by trawlers on eastern coast of India and reduction of bycatch.

5.2.3 Please indicate, from your country's standpoint, the extent to which the following **local** management issues require **international** cooperation in order to achieve progress. **[PRI]**
In other words, how important is **international** cooperation for addressing these issues?
Please select only one per line

	NOT AT ALL	LIMITED	IMPORTANT	ESSENTIAL
Illegal fishing in territorial waters	☐	☐	☑	☐
Incidental capture by foreign fleets	☐	☐	☑	☐
Enforcement/patrolling of territorial waters	☐	☐	☑	☐
Hunting/harvest by neighboring countries	☐	☐	☑	☐
Poaching, illegal trade in turtle products	☐	☐	☐	☑
Development of gear technology	☐	☐	☐	☑
Oil spills, pollution, marine debris	☐	☐	☑	☐
Training / capacity-building	☐	☐	☐	☑
Alternative livelihood development	☐	☐	☐	☑
Identification of turtle populations	☐	☐	☐	☑
Identification of migration routes	☐	☐	☐	☑
Tagging / satellite tracking	☐	☐	☐	☑
Habitat studies	☐	☐	☐	☑
Genetics studies	☐	☐	☐	☑

Use the text box to list and rank any other local management issues for which international cooperation is needed to achieve progress.
› Development of gear technology - Local versions have been developed.
Training / capacity-building - Limited, capacity likely exceeds that of neighbours Identification of turtle populations - Especially in areas where they overlap Tagging / satellite tracking - Limited to a few areas
Habitat studies - Limited (gulf of mannar)
Genetics studies - Limited to a few areas

5.3 Cooperation and Information exchange

5.3.1 Identify existing frameworks/organisations that are, or could be, useful mechanisms for cooperating in marine turtle conservation at the sub-regional level. Please comment on the strengths of these instruments, their capacity to take on a broader coordinating role, and any efforts your country has made to enhance their role in turtle conservation. **[INF, BPR]**
› SAARC - The SAARC secretariat supports training of wildlife managers, biologists and such other officials from the SAARC nations in any regional training programmes. The SAARC secretariat may be approached to support a sub-regional initiative on sea turtle conservation.
SACEP - The South Asia Cooperative Environment Program Secretariat located at Sri Lanka also has the mandatory of to promote regional co-operation in South Asia in the field of environment, both natural and human in the context of sustainable development and on issues of economic and social development which also impinge on the environment and vice versa; to support conservation and management of natural resources of the region and to work closely with all national, regional, and international institutions,

governmental and non governmental, as well as experts and groups engaged in such co-operation and conservation efforts.
NIOMTTF- A Northern Indian Ocean Marine Turtle Task Force has been established under the auspices of the IOSEA and India is a member of the Task Force. The objective of the Task Force is to serve explicitly to facilitate implementation of the IOSEA Marine Turtle MoU (including its Conservation and Management Plan) in the Northern Indian Ocean sub-region.

5.3.2 Has your country developed, or is it participating in, any networks for cooperative management of shared turtle populations? **[BPR, INF]**
☑ NO

5.3.3 What steps has your country taken to encourage Regional Fishery Bodies (RFBs) to adopt marine turtle conservation measures within Exclusive Economic Zones (EEZs) and on the high seas? Please describe the interventions made in this regard, referring to specific RFBs. **[SAP]**
› None at this moment.

5.4 Capacity-building

5.4.1 Describe your country's needs, in terms of human resources, knowledge and facilities, in order to build capacity to strengthen marine turtle conservation measures. **[PRI]**
› The marine protected areas and marine environment conservation and management responsibility rests with the forest and wildlife departments of maritime states. While the managerial strength, in terms of number, is adequate and their capacity building is taken care of by the Wildlife Institute of India, there is a need to reorient them into the marine environment management. NGOs and other research institutions working at specific sites also contribute to capacity building and training.
Similar capacity enhancement is also required for research biologists in the marine environment. Exchange programmes, short duration field visits, hands-on training workshops etc will be required for sea turtle conservation and management in India. Also there is a need of programmes on awareness regarding turtle conservation among the coastal communities.

5.4.2 Describe any training provided in marine turtle conservation and management techniques (e.g. workshops held, training manuals produced etc.), and indicate your plans for the coming year. **[PRI, INF]**
› MoEFCCCC in collaboration with Wildlife Institute of India and GIZ, have conducted series of training programmes to various level of officers of Forest Departments and Fisheries Departments. So far, 18 training programs have been conducted and trained more than 500 officers who have been managing the turtles habitats in the country. Further, Forest Departments of coastal states and UTs have also been conducting referesher training programme for their staff to effectively protect and conserve the turtle habitats.
In the past, a number of workshops and short duration programmes under GOI-UNDP Sea Turtle Conservation Project were also undertaken.
A week-long training programme on sea turtle satellite telemetry for research personnel and wildlife managers was conducted during March 2007 in Odisha and later in Sri Lanka during February 2010. The WII in collaboration with GIZ is planning to conduct seies of capacity building program towards monitoring and management of coastal and marine biodiversity including sea turtles in next three years starting from December 2014.]
National:
K. Sivakumar, Sarang Kulkarni, Neeraj Khera, 2015. Curriculum on Coastal and Marine Biodiversity and Protected Area Management in India. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and Wildlife Institute of India. Twelve Modules with Training Guide to Trainers.
• Shanker, K., B.C. Choudhury & H.A. Andrews (2003) Sea turtle conservation: Beach Management and hatchery programmes. Centre for Herpetology/Madras Crocodile Bank Trust, Tamil Nadu, India.
• Shanker, K., B. Pandav & H.A. Andrews (2003) Sea turtle conservation: Research and management techniques. Centre for
Herpetology/Madras Crocodile Bank Trust, Tamil Nadu, India.
• Shanker, K., B. Pandav & B.C. Choudhury (2003) Sea turtle conservation: Population Monitoring and Census. Centre for
Herpetology/Madras Crocodile Bank Trust, Tamil Nadu, India.
• Choudhury, B.C., Tripathy, B. and H.V. Andrews (2003) Sea turtle conservation: Eco (turtle) friendly coastal development. Centre for Herpetology/Madras Crocodile Bank Trust, Tamil Nadu, India.
• Shanker, K., B.C. Choudhury & C.S. Kar (2010) Census techniques for arribadas. ATREE, Bangalore and Marine Turtle
Conservation Act Fund, USFWS.
Several training workshops are held by the NGOs in specific areas. Too many to be listed here.
The Turtle Action Group (TAG-INDIA) has held a national sea turtle workshop each year since 2009: Chennai, January
2009; Bhubaneshwar, January 2010; Kumta, November 2010). Capacity building and training is built into these workshops.

The 30th Annual Symposium on Sea Turtle Biology and Conservation was held in Goa, India, in April 2010. Held in the South Asian region for the first time, it had 500 participants from more than 50 countries across the world. Several training workshops (statistics, stable isotopes, rehabilitation, marine invasives, etc) were held as part of the symposium.

5.4.3 Specifically in relation to **capacity-building**, describe any partnerships developed or planned with universities, research institutions, training bodies and other relevant organisations. **[BPR]**
› All research programmes are carried out through coast-based universities for capacity building of academic researchers. Collaborations also have existed with Centre for Cellular and Molecular Biology for conservation genetics related issues. For fisheries related issues, the Central Marine Fisheries Research Institute, Central Institute of Fisheries Technology are collaborating with the MoEFCC.
Major institutional collaborations for research include: Wildlife Institute of India and Indian Institute of Science, Bangalore.

5.5 Enforcement of conservation legislation

5.5.1 National policies and laws concerning the conservation of marine turtles and their habitats will have been described in Section 1.5.1. Please indicate their effectiveness, in terms of their practical application and enforcement. **[SAP, TSH]**
› Yes, the Indian Wildlife (Protection) Act, 1972 is very effective in protection of sea turtles in India. An exclusive Chapter on 'Coastal and Marine Conservation' has been included in the 15 Year National Wildlife Action Plan (2017-2031). This Chapter provides for priority actions for conservation of coastal and marine wildlife.
There are many more laws and policies that concern the conservation of marine turtles. See reviews below for details. Upadhyay, S. & V. Upadhyay. 2002. International and national instruments and marine turtle conservation in India. Journal
of International Wildlife Law and Policy 5(1 & 2): 65-86. See also:
In Shanker and Choudhury (2006)
Part 7 - Legal Instruments for the Conservation of Marine Turtles
Chapter 24. Laws and Marine Turtle Conservation in India – Sanjay Upadhyay and Videh Upadhyay
Chapter 25. International Instruments and Marine Turtle Conservation – Sali J Bache and John G Frazier

5.5.2 Has your country conducted a review of policies and laws to address any gaps, inconsistencies or impediments in relation to marine turtle conservation? If not, indicate any obstacles encountered in this regard and when this review is expected to be done. **[SAP]**

Please give details.
☑ YES

› Yes, recently a review of policies and laws are in the final process of review has been initiated by the Government of India but the results are awaited. But there was a review on research gaps in conservation and management of coastal and marine biodiversity including sea turtles in India carried out by Wildlife Institute of India in consultation with experts from all over country.
See
K. Sivakumar (Ed.) 2013. Coastal and Marine Protected Areas in India: Challenges and Way Forward, ENVIS Bulletin: Wildlife & Protected Areas. Vol. 15 Wildlife Institute of India, Dehradun-248001, India. 368 pp
Tripathy, B., R. S. Kumar, B. C. Choudhury, K. Sivakumar & A. K. Nayak. 2009. Compilation of Research Information on Biological and Behavioural Aspects of Olive Ridley Turtles along the Odisha Coast of India – A Bibliographical Review for Identifying Gap Areas of Research. Wildlife Institute of India, Dehra Dun & IUCN-India, New Delhi. K. Sivakumar, J.A. Johnson, B.C. Choudhury and V.B. Mathur,2010. Identification of research gaps in Coastal and Marine Biodiversity Conservation in India. Wildlife Institute of India, Dehradun, India.

5.5.3 From the standpoint of law enforcement, has your country experienced any difficulties achieving cooperation to ensure compatible application of laws across and between jurisdictions? **[TSH]**

Please give details.
☑ UNSURE

OBJECTIVE VI: PROMOTE IMPLEMENTATION OF THE MOU, INCLUDING THE CMP

6.1 IOSEA Marine Turtle MoU membership and activities

6.1.1 What has your country already done, or will it do, to encourage other States to sign the IOSEA MoU? **[INF]**

› Two meetings of Northern Indian Ocean Marine Turtle Task Force have already been conducted. Being a Focal Point of South-Asia Sub-Region, India would try to organise the Sub-Regional Meeting/workshop and consider supporting attendance of a larger delegation in future IOSEA meetings with higher participation of stakeholders including the MoEFCCCC and State Forest Departments.
Further, India will constitute the 'National Task Force' for conservation of sea turtles in the country

6.1.2 Is your country **currently** favourable, in principle, to amending the MoU to make it a legally binding instrument? **[INF]**

☑ NO VIEW

6.1.3 Would your country be favourable, over a **longer time horizon**, to amending the MoU to make it a legally-binding instrument? **[INF]**

☑ NO VIEW (Use the text box to elaborate on your response, if necessary)

› However, it is mentioned that in the Indian context, the Wildlife Protection Act provides a very strong legal framework for implementation of MoU.

6.2 Secretariat and Advisory Committee

What efforts has your country made, or can it make, to secure funding to support the core operations of the IOSEA MoU (Secretariat and Advisory Committee, and related activities)? **[IND]**

› The Ministry of Environment, Forest and Climate Change, Government of India is supporting financially, the Marine Protected Areas which also harbours Marine Turtles through out its coast line on both Arabian Sea and Bay of Bengal respectively.
The Government of India is contemplating implementing a project viz. the Marine Turtle conservation project, through out the maritime areas of the country, involving nine States and five Union Territories over a coastline of 7600 running kms and two islands

6.3 Resources to support implementation of the MoU

6.3.1 What funding has your country mobilised for **domestic** implementation of marine turtle conservation activities related to the IOSEA Marine Turtle MoU? Where possible, indicate the specific monetary values attached to these activities/programmes, as well as future plans. **[IND]**

› Both state and federal governments provide financial assistance for conservation of turtles including habitat protection and improvement and research work.

6.3.2 Has your country tried to solicit funds from, or seek partnerships with, other Governments, major donor organizations, industry, private sector, foundations or NGOs for marine turtle conservation activities? **[IND]**

☑ YES (If yes, give details of the approaches made (both successful and unsuccessful))

› Yes, from sources such as GEF-UNDP through Government of India programmes. Other national NGOs, such as WWF-India, have made attempts to raise funds from other donor agencies.

6.3.3 Describe any initiatives made to explore the use of economic instruments for the conservation of marine turtles and their habitats. **[BPR]**

› The financial allocation under the Centrally Sponsored Scheme 'Integrated Development of Wildlife Habitats' has increased three times over a period of five years and commensurate money for marine turtle conservation has also increased. In addition, funding support is also provided under the Compensatory Afforestation Fund management and Planning (CAMPA) for conservation of Dugongs and its habitats. In addition, funds for marine conservation are also made available under the CSR by Corporate Houses. For example, the National Thermal Power Corporation Ltd (NTPC Ltd) and Andhra Pradesh Forest Department jointly conserving an endangered Olive Ridley Sea Turtles along the sea coasts of nine districts of the State from extinction under its Corporate Social Responsibility and sustainable development initiative. Similarly, TATA Chemicals and Gujarat Forest Department jointly conserving the marine biodiversity along Gujarat coast that include whale shark and sea turtles

6.4 Coordination among government agencies

6.4.1 Has your country designated a lead agency responsible for coordinating national marine turtle

conservation and management policy? If not, when is this information expected to be communicated to the IOSEA MoU Secretariat? **[IND]**

Please elaborate, as necessary.
☑ YES

› The Ministry of Environment and Forests (MoEFCC), Government of India, is the lead agency and has designated the Inspector General of Forests (Wildlife) to be the national director for coordinating marine turtle conservation programmes and policies.

6.4.2 Are the roles and responsibilities of all government agencies related to the conservation and management of marine turtles and their habitats clearly defined? **[IND]**

Use the text box to elaborate.
☑ YES

› The federal government through the MoEFCC is to provide the policy framework and national guidelines for the maritime states to develop appropriate conservation action plans and implement them with support from the federal government.

6.4.3 Has your country ever conducted a review of agency roles and responsibilities? If so, when, and what was the general outcome? If not, is such a review planned and when? **[SAP]**

This question seeks to ascertain whether Signatories have made a serious examination of which agencies have a role to play in marine turtle conservation, either directly or indirectly, and which therefore should be apprised of the IOSEA MoU and its provisions.
If no internal review of interagency roles and responsibilities has been or will be undertaken, please elaborate if only to indicate that the necessary arrangements are already clear and not in need of further review.
☑ NO (Use the text box to elaborate)

› Reviews are planned at this moment.

OTHER REMARKS

Please provide any comments/suggestions to improve the present reporting format.
› NO COMMENTS

Feel free to include additional information not covered above:
› NIL