

**Social Dimensions of Sea Turtle Protection in Orissa, India:
A Case Study of the Gahirmatha (Marine) Wildlife Sanctuary
and the Nesting Beaches of Rushikulya and Debi**

**International Collective in Support of Fishworkers
Chennai**

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List of Acronyms

BPL	below poverty line
CBD	Convention on Biological Diversity
CEC	Central Empowered Committee
CITES Fauna and Flora	Convention on International Trade in Endangered Species of Wild Flora
CMS Species	Convention on International Trade Convention on Migratory
DRDO	Defence Research and Development Organization
FIR	First Information Reports
FSI	Fishery Survey of India
GPS	global positioning system
GT	gross tonnage
MDG	Millennium Development Goals
NGO	non-governmental organization
NHRC	National Human Rights Commission
NREGS	National Rural Employment Guarantee Scheme
OMFRA	Orissa Marine Fishing Regulation Act
OMRCC	Orissa Marine Resources Conservation Consortium
OTFWU	Orissa Traditional Fish Workers Union
PA	protected areas
PCCF	Principal Chief Conservator of Forests
PHC	primary health centre

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RSTPC	Rushikulya Sea Turtle Protection Committee
TED	turtle excluder devices
UNCLOS	United Nations Convention on the Law of the Sea
VMS	vessel monitoring system
WII	Wildlife Institute of India
WLPA	Wild Life Protection Act

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Executive Summary

This study focuses on the legal framework for sea turtle protection in the Indian State of Orissa. It documents the social consequences of turtle protection measures on fishing communities, and analyzes their experiences with various aspects of sea turtle protection. Its specific site focus is the Gahirmatha (Marine) Wildlife Sanctuary, and the Rushikulya river mouth and the Devi river mouth area.

The study draws substantially on two previous studies of the area undertaken in 2004 and 2005, and, based on field work during 24-30 November 2008, updates information on the current status of sea turtle conservation measures in Orissa.

The study report is divided into six parts. The first part examines the legal framework for turtle protection in Orissa, focusing on both wildlife and fishing regulations. The second part deals with the State's fisheries and fishing communities. The third part analyzes the implementation of the protection measures. The fourth part narrates the experiences of fishing communities in the light of recent turtle protection initiatives. The fifth part provides the conclusions of the study, while the final, sixth part puts forward some recommendations on measures that could, within the existing legal framework, help balance sea turtle protection and the livelihood needs of fishing communities.

Orissa's coastline of 480 km and continental shelf of 24,000 sq km are spread across six coastal districts. The marine fisherfolk population has increased threefold between 1980 and 2005, to number 450,391, around 1.2 per cent of the total population of the State, distributed across 641 marine fishing villages. Fishing villages are mainly located in remote areas, with poor access to basic services like education and health, and to paved roads, and transportation facilities. The main fishing craft used by the mechanized sector are trawlers, gillnetters and *dol*-netters, while plank-built boats and *teppas* are used by the small-scale artisanal sector.

The Gahirmatha (Marine) Wildlife Sanctuary, proposed in 1975 to protect the sea turtle nesting and breeding habitats, was finally designated in 1997. Orissa is the only State in India where turtle protection measures are undertaken within the framework of the Wild Life Protection Act (WLPA), 1972, and the Orissa State Marine Fishing Regulation Act (OMFRA), 1982, and Rules, 1983. The two legal frameworks have different approaches: The WLPA focuses on protection, and prohibits all activities inside protected areas (PAs), except for a few restricted activities. The OMFRA adopts a fisheries development focus by restricting, regulating or prohibiting certain activities.

Although the WLPA provides for the innocent passage of vessels in PAs within territorial waters, fishers often find it difficult to prove their innocence. Patrolling of the sanctuary's waters has been made difficult by the fact that patrolling officers cannot determine whether fishing vessels are fishing inside the sanctuary or merely exercising their right of innocent passage through it.

The rise in the number of prohibitions and regulations has affected traditional and small-scale fishing operations and communities, by reducing the actual area available for fishing, by cutting down the number of fishing days as well by curtailing access to fishing grounds.

The social consequences—both direct and indirect—of the implementation of turtle protection measures on Orissa's fishing communities are many. They range from loss of livelihoods due to reduced access to fishing grounds, confiscation of vessels and arrest of crew to lengthy legal processes that undermine the socioeconomic status of fishers. It is not only active fishers who are

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directly affected by sanctuary regulations but also women who are actively involved in post-harvest and marketing activities. Turtle conservation measures have thus alienated fishing communities, who feel targeted and excluded. In recent years, Orissa's fishing communities report higher levels of indebtedness, suicides and cases of mental illness.

In view of the fact that there are still no clear indicators to show conclusively that Orissa's sea turtle population has indeed been restored or maintained, even after years of protection measures, these issues need to be urgently and sensitively addressed, in the interests of social justice and equity. This would also be in keeping with Section 26A of the WLPA, which highlights the need for measures to protect the occupational interests of local fishermen within sanctuaries, and the need to protect the right of innocent passage of any vessel or boat through the territorial waters.

It is important to recognize the significance of conserving sea turtles, an important flagship species, and their habitat, within a wider coastal and marine management framework. It is equally important to take into account the social consequences of the implementation of conservation and management measures. Alternatives for the restoration and maintenance of turtle nesting populations, and the sustainable use of fisheries resources should attempt to go beyond an 'exclusionary protectionist mode' to an 'inclusive conservation mode'.

Among the measures that can address these issues are: better implementation of existing legal provisions in the OMFRA and the WLPA; enhanced monitoring and enforcement with the active participation of fishers; improving the effectiveness of conservation; conduct of regular meetings of the official committees appointed for turtle conservation measures; increased training and capacity building for fishing communities; and enhancing livelihood options for communities by taking into account their low skill sets and education levels, and the poor availability of basic services.

In the long term, it is necessary to move towards a comprehensive marine and coastal conservation and management policy framework, which will take into consideration India's international obligations under various Conventions and regional instruments. The aim should be to balance protection of turtles with the sustainable use of fisheries resources. The legitimate access rights of fishers should be better recognized, and fishing communities should be encouraged to participate actively and fully in decision-making processes.

**Social Dimensions of Sea Turtle Protection in Orissa, India:
A Case Study of the Gahirmatha (Marine) Wildlife Sanctuary and the Nesting
Beaches of Rushikulya and Debi¹**

Introduction

India's marine and coastal resource protection measures were first initiated in 1967, with the declaration of the Point Calimere wildlife sanctuary in Tamil Nadu, to protect wetland habitat of waterfowl birds (Singh 2002). In 1972, the Indian Wild Life (Protection) Act (WLPA) was notified as the overarching national framework for protection of wild animals, birds and plants, with provisions for two forms of protection. Protected areas (PAs) are one form, in which areas are designated as National Parks/Sanctuaries/Conservation Reserves/Community Reserves, for the purpose of protecting, propagating or developing wildlife or the environment, including landscapes, seascapes, flora and fauna and their habitat; and protecting traditional and cultural conservation values and practices. The other form of protection is to list species under the various Schedules of the WLPA, which prohibit them from being hunted or extracted. Though the WLPA is legislated by the Central government, its implementation is by the Chief Wildlife Warden of the State Forest and Wildlife Departments.

Of the 617 PAs in India, 31 are located in marine and coastal areas, with the most recent PA in the marine and coastal ecosystem being the Gahirmatha (Marine) Wildlife Sanctuary, designated in 1997, to protect the sea turtle nesting and breeding habitat (GOI 2008², Singh 2002, SCBD 2006). Most often, PAs are designated to protect habitats like mangroves, coral reefs and seagrass beds. The 1991 Amendment of the WLPA first addressed the need to protect offshore marine flora and fauna, and extended the provisions of PAs to the territorial waters. There are specific references to the need to take adequate measures to protect the occupational interests of local fishermen. The subsequent Amendments of the WLPA (2002, 2006) have identified new categories of PAs, such as Conservation Reserves, Community Reserves and Tiger Reserves, which have specific provisions for the involvement of communities in their management.

This study focuses on the social consequences of turtle protection measures on fishing communities, and identifies measures that could be undertaken, within the existing legal framework, to balance sea turtle protection with the livelihood needs of fishing communities. The first part of the study looks at the legal framework for turtle protection in Orissa, focusing on both wildlife and fishing regulations. The second part focuses on the fisheries and fishing communities of the State. It also provides a brief profile of the fisheries sector. The third part discusses the implementation of protection measures, while the fourth part examines the social consequences of turtle protection measures in

¹ This paper, prepared by Ramya Rajagopalan, is a follow-up to two previous ICSF studies undertaken by Aarthi Sridhar (2005) and Sebastian Mathew (2004), and draws extensively on them. It provides an update on the current situation regarding sea turtle conservation measures in Orissa, based on discussions and field work undertaken by Ramya Rajagopalan and Varsha Patel from 24-30 November 2008.

² Protected Area Database, ENVIS, Wildlife Institute of India, Available online at : http://www.wii.gov.in/envis/pa_database.html

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Orissa, and the impacts on fishing community livelihoods. The fifth part provides the conclusions of the study, and the sixth part puts forward recommendations.

Part I: Turtle Protection Measures in Orissa

India is one of the major mass-nesting rookeries of the olive ridley turtle (*Lepidochelys olivacea*) population, besides Mexico and Costa Rica. Orissa is home to three nesting beaches—Gahirmatha³, Rushikulya and Devi river mouths.

Orissa is the only State in India where turtle protection measures are undertaken within the framework of the WLPA and the Orissa State Marine Fishing Regulation Act (OMFRA), 1982, and Rules, 1983, even though the OMFRA's definition of 'fish' does not include turtles, nor are they a targeted fishery in the State (Mathew 2004). The two legal frameworks have different approaches: while the WLPA focuses on protection, and prohibits all activities inside PAs, except for a few restricted activities, the OMFRA has a fisheries development focus with certain activities being restricted, regulated or prohibited.

The Gahirmatha (Marine) Wildlife Sanctuary⁴, proposed in 1975, and finally declared in 1997⁵, includes territorial waters⁶, as well as Reserve Forests⁷ (mangroves), mud flats, and accreted sand bars. The Gahirmatha beach was initially part of the Bhitarkanika wildlife sanctuary, which was designated in 1975, to protect saltwater crocodiles⁸. The sanctuary, declared for the purpose of protecting, propagating or developing wildlife, covers an area of 1,408 sq km of water body and 27 sq km of land mass⁹ (see Map 1). The sanctuary is classified into a Core Area¹⁰ (725.50 sq km) and a Buffer Area (709.5 sq km) for management purposes, to restrict and regulate activities inside the sanctuary. The Core Area is a zone where all forms of fishing are prohibited, while in the Buffer Area, fishing is allowed for non-motorized vessels using gillnets and other fishing gear.

Although Rushikulya and Devi river mouth are not declared as PAs, the Forest Department undertakes regular monitoring of both areas during the turtle nesting season,

³ The portion of the beach between Maipura and the Hansua river mouth, stretching over a distance of 38 km, known as the Gahirmatha beach, is the largest rookery for olive ridleys in India.

⁴ It is the first marine sanctuary out of existing 25 wildlife (marine) sanctuaries that have been declared with the prior concurrence of the Central Government and with the approval of the Chief Naval Hydrographer, following the procedures set under the WLPA.

⁵ vide Notification No. 18805-F&E, dated 27 September 1997, by the Forest and Environment Department

⁶ It is important to note that the boundary of the sanctuary extends 20 km into the territorial waters and extends from Ekakula Nasi to the Mahanadi river mouth.

⁷ Hukitola Reserve Forest, Bhitarkharnasi (A) and Bhitarkharnasi (B) Reserve Forests.

⁸ Vide Notification No. 6958/FF AH dated 22 April 1975, c.f. www.bhitarkanika.org/abtbhitar.htm

⁹ The boundaries of the sanctuary are: North boundary—Short's island, Wheeler islands, Dhamra estuary, mouth of river Dhamra, Bay of Bengal; South—Mouth of river Mahanadi, Paradeep port, Bay of Bengal; East—Bay of Bengal; and West—Shore line of Bhitarkanika wildlife sanctuary, islands, mudflats and forest of Mahanadi delta.

¹⁰ The Core Area covers an average width of 11 km offshore from Ekakulanasi in the northeast to 'Barunei Muhana' in the southwest and an average width of 65 km from 'Barunei Muhana to Mahanadi Muhana', with total restriction imposed throughout the year.

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besides organizing activities like beach clean-ups and counting nesting and dead turtles, besides patrolling the offshore areas up to 10 km. The Forest Department also has a proposal to designate these areas, where currently only fishing regulations are being implemented, as sanctuaries too.

Map 1: Gahirmatha (Marine) Wildlife Sanctuary



Source: Forest Department, Orissa

Fishing regulations

Even before the Gahirmatha sanctuary was declared, fishing regulations were implemented within the framework of the OMFRA and subsequent Rules notified under the Act, in 1983 (Mathew, 2004).

There are three important areas where fishing is currently regulated under the OMFRA for turtle protection: the 20-km seaward radius 'no-fishing area'¹¹ from the Dhamra river mouth to the Barunei river mouth¹² through the year (Mathew 2004, Sridhar 2005); the 20-km seaward distance 'no-trawling area' from the three river mouths¹³ from 1 January to 31 May every calendar year; and a 10-km distance into the sea from three specified coasts¹⁴, where fishing by motorized and mechanized vessels is prohibited in the sea turtle congregation area from 1 November to 31 May every year.

¹¹ This is issued under clause (c) of sub-section (i) of section 4 of the Orissa Marine Fishing Regulation Act, 1982,

¹² Vide notification No 22781-7 Fy (M) 23/93 –FARD-Dated the 27th December 1993, Annexure – XIX.

¹³ Jatadhar river mouth to Devi river mouth and from Chilika river mouth to Rushikulya river mouth

¹⁴ namely Dhamra mouth between Shorts Island and Udabali north, Devi mouth between Keluni Muhana and New Devi Nasi island north, and Rushikulya mouth between south of Prayagi to north of Aryapalli,

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Since 2005, regulation has been imposed on fishing using gillnets within a belt of 5 km of the seaward distance near the river mouths, from 1 November to 31 May every year¹⁵. Besides these restrictions, ring-seines are banned along the entire coast of Orissa, throughout the year. These regulations, notified post-2005, were based on the recommendations of the Central Empowered Committee (CEC)¹⁶, constituted by the Supreme Court of India.

Besides these, there is the mandatory requirement for trawlers fishing off the Orissa coast to have turtle excluder devices (TEDs) fitted to their nets (Mathew 2004, Sridhar 2005)¹⁷. The OMFRA also regulates fishing by mechanized fishing vessels within 5 km from the coast, as these areas are reserved for traditional fishing vessels. However, implementation is often problematic as small trawlers are reportedly seen fishing within 5 km of the seaboard in Astaranga, Kendrapara and Ganjam areas (Mathew 2004, Sridhar 2005, Greenpeace 2008).

The authorized officers¹⁸ for effective enforcement of fishing regulations under the OMFRA include the Coast Guard and Forest Rangers, besides the Assistant Conservators of Forests (ACF)¹⁹, according to amendments to the OMFRA in 2006. There are other Notifications issued by the Fisheries Department towards regulating fishing vessels and gear (see Appendix II for a complete list). However, the existing provisions under the OMFRA are not strictly implemented.

¹⁵ The regulation prohibits use of multifilament gillnets of length more than 300 m, with mesh size below 140 mm and twine diameter of 0.7 mm, and monofilament gillnets of the same dimension and above, with twine diameter of 0.5 mm. The distance between the two pieces of net is to be 200 m. Notification vide: No. 7.Fy.Sch. 22/2004 11327/FARD/ 21 July 2005. The same Notification also prohibits the use of ring-seine nets along the entire coast throughout the year.

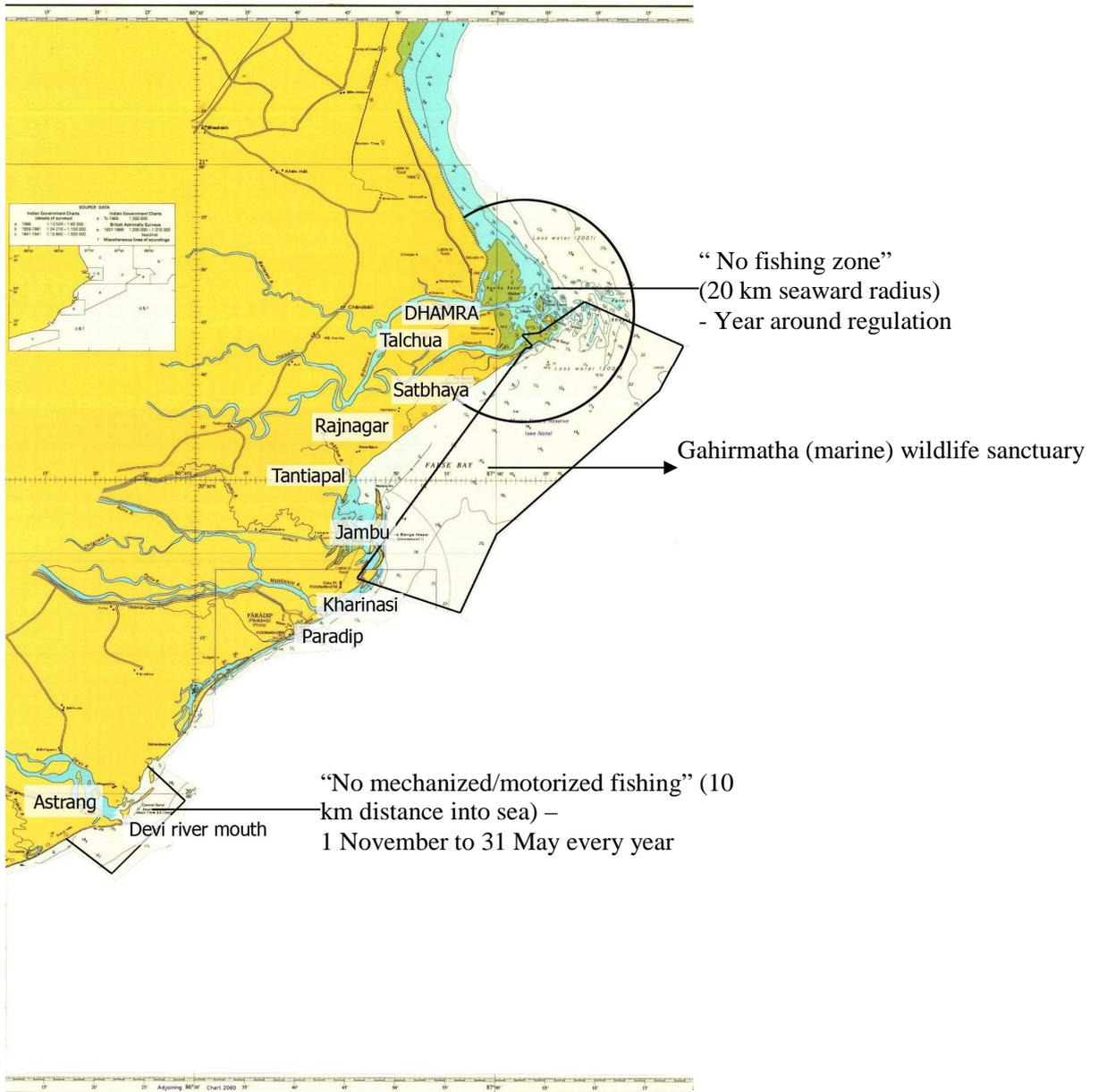
¹⁶ The CEC was constituted by the Supreme Court of India, in a Writ Petition Civil No. 202/95 and 171/96. The recommendations were in response to the Application No. 46, filed on 19 December 2002 by Alok Krishna Agarwal, regarding protection of endangered olive ridley sea turtles in Orissa.

¹⁷ Notification dated 17 April 2001

¹⁸ The OMFRA defines authorized officer as such officers as the government may, by notification, authorize in respect of the matter to which reference is made in the provision of this Act in which the expression occurs.

¹⁹ The Orissa Marine Fishing Regulation (Amendment) Act, 2006 amends the relevant section 3 of OMFRA Act, 1982, with a view to declaring Forest Rangers (Group –C) as authorized officers for effective enforcement of fishing regulations, as suggested by the CEC. Besides this, Assistant Conservators of Forest (ACFs) of Coastal Forest Divisions have been designated as authorized officers under the OMFRA Act and Rules. Memo No. 7884/1/WL (E) 64/2006 dated 7 December 2006, Office of the Principal CCF (Wildlife) & Chief Wildlife Warden, Orissa, and Notification No. 4FY.11.16/2000 (PT_1)24428/FARD dated 27 December 2003 and Notification No. 6593/FARD dated 20 March 2003

Map 2: Fishing Regulations in Gahirmatha and Devi River Mouth Area



Source: Naval Hydrographic Chart – Puri to Sandheads

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Management and monitoring

One of the major management tasks of the sanctuary, undertaken by the State Forest Department, is to monitor turtle mortality and nesting population (see Appendix IV for turtle population and mortality figures)²⁰. Two management plans have been prepared for the Gahirmatha (Marine) Wildlife Sanctuary, the first in 2001, subsequently revised in 2007, to be implemented during the period 2008-2018 (which is still in its draft form). These management plans, providing the list of activities that are prohibited and restricted within sanctuary limits, are prepared by the Forest Department. Although the National Wildlife Action Plan (2006-2016) states that management plans for PAs should seek to involve local communities, the Gahirmatha marine sanctuary management plans were prepared without much consultation with other departments or with local communities. The Forest Department, however, says that some of the activities undertaken within the sanctuary for the benefit of the local communities include ecotourism and eco-development.

The latest amendment to the WLPA, in 2003, proposes setting up Sanctuary Advisory Committees to render advice on measures for better conservation and management, with the participation of the people living within, and around, the sanctuary; this is still under process in Gahirmatha²¹. Management is thus largely undertaken based only on discussions within the Forest Department and the various committees (High Power Committee and Consultative Monitoring Committees).

The Forest Department has certain limitations in ensuring the implementation of regulations within the sanctuary and in other nesting sites. These limitations include lack of financial support, lack of information on socioeconomic aspects, and lack of patrolling vessels²². The lack of trained staff to handle issues relating to marine ecosystems is also identified as a limitation.

The Coast Guard enforces the various regulations relating to turtle protection, based on requests from the Fisheries and Forest Departments, and undertakes regular patrolling. Those apprehended are handed over to the Forest Department by the Coast Guard. Recently, joint patrolling activities are being undertaken by the Coast Guard, along with the Forest Department and Fisheries Department, to effectively monitor the sanctuary area.

CEC

The CEC proposed remedial measures for turtle protection in Orissa. These related to restrictions on fishing, as well as to regulation of aquaculture activities; strengthening of infrastructure and personnel; the role of the Coast Guard and the Defence Research and

²⁰ Monitoring turtle deaths/nesting turtle populations is one of the important tasks undertaken by the Forest Department in the Gahirmatha (Marine) Wildlife Sanctuary, while NGOs and others are involved in the Rushikulya and Devi areas.

²¹ The members of the Committee are supposed to include representatives of the *panchayati raj* institutions in the constituency, along with two representatives of non-governmental organizations (NGOs), besides others. Section 33-B. Advisory Committee of WLPA.

²² Gahirmatha Management Plan 2008-2018.

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Development Organization (DRDO); restrictions on lighting in turtle nesting areas; and removal of casuarina plantations (CEC 2004, see Appendix I for list of CEC recommendations).

A Consultative Monitoring Committee for sea turtle protection has been formed, based on CEC recommendations, with the Orissa Traditional Fish Workers Union (OTFWU) as one of its members²³. In August 2007, a Task Force²⁴ was constituted for monitoring CEC recommendations, and to suggest measures for the welfare of fishing communities in Orissa, during the fishing ban period. Though the committee was formed more than a year back, it has not officially met (as of 27 November 2008).

While turtle protection efforts have intensified in the last few years, there is not much information about their positive impact on turtle populations. There is no particular trend that can be observed based on turtle nesting populations seen on Gahirmatha beach, as there are years with no mass nesting reported, followed by years with very high nesting populations (see Appendix IV). The rate of mortality is also not a clear indicator, as the cause for the mortality is not clearly established; the mortality of turtles could also be due to other biological factors (Shanker and Chowdhury 2006). It is thus difficult to deduce any direct causal relationship between an increase in fishing vessel confiscation with an improvement in the status of turtle population off the Orissa coast.

Part II: Orissa: Fishing Communities and Fisheries

Fishing communities

Orissa's coastline of 480 km and continental shelf of 24,000 sq km are spread across six coastal districts²⁵. The marine fisherfolk population (450,391) comprises about 1.2 per cent of the total population of Orissa and is distributed across 641 marine fishing villages (see Appendix V). The total marine fisherfolk population in Orissa has increased threefold in the last 25 years, from 1980 to 2005 (CMFRI 2005).

Fishing villages are mainly located in remote areas, with no access to paved roads²⁶ and transportation facilities, which, in turn, affects access to markets, so much so that the fishers often land their catch at distant landing centres (Aide et Action 2008). Poor rural connectivity and inadequate transport facilities²⁷ have also affected access to health and education. Not all villages have access to basic health services such as primary health centres (PHCs), forcing people to travel to the nearest town, 20 km away, for healthcare.

²³ The members of the committee are Principal Secretary (Government Home Department), Commissioner-cum-Secretary (F & ARD), Principal Chief Conservator of Forests (Wildlife), Director of Fisheries, Joint Director/Deputy Director of Fisheries (marine), PCCF (Wildlife), and President of the OTFWU.

²⁴ Notification vide: No. 7Fy-Sch-112/07/9926 dated 20 August 2007 on Formation of Task Force (Fisheries & A.R.D. Department) Members of the task force are: Director of Fisheries, Orissa; Joint Director/Deputy Director of Fisheries (Marine); one representative of PCCF (WL); and one representative of OTFWU.

²⁵ Balasore, Bhadrak, Kendrapara, Jagatsinghpur, Puri and Ganjam

²⁶ According to the Government of Orissa, only 11 per cent of the village roads were paved in 1999-2000. <http://www.orissa.gov.in/works/rnetwork.htm>

²⁷ According to the Economic Survey 2004-05, only about 40 per cent of the villages in Orissa have all-weather connectivity, which is much lower than the national average of 60 per cent.

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The spatial distribution map of PHCs in Orissa shows that there are not many PHCs in the coastal villages and blocks²⁸. Not all the coastal fishing villages have access to schools, most of which are only up to the primary or secondary level. This could also be one reason for the low rate of literacy among Orissa's fisherfolk population (50 per cent) (CMFRI 2006). The lack of basic facilities also hinders the development of alternative livelihood options for the next generation (Aide et Action 2008).

The northern part of the Orissa coast is dominated by Bengali-speaking Hindu fishers of the *Kaibarta* and *Khandayats* caste from West Bengal, and by people resettled from erstwhile East Pakistan. They fish using gillnets and plank-built vessels. The southern half of the Orissa coast is predominantly inhabited by the Telugu-speaking fishers, belonging to the *Vadabaliyas* and *Jalaris* caste, originally from Andhra Pradesh, who fish using gillnets and hooks-and-line on board *teppas* (a type of *kattumaram* or its modern adaptation). The Oriya-speaking fishers are mostly trawler owners or workers along the central part of the Orissa coast. Women play an important role in the social setting of the fishing community, apart from being actively involved in marketing and post-harvest activities. Along parts of the Orissa coast, especially in Kendrapara, they are also involved in creek fishing and crab collection.

Trawlers, gillnetters and *dol*-netters are the main craft used by the mechanized sector, while plank-built boats and *teppas* are used by the artisanal sector. Of the total 23,740 fishing vessels, 3,577 are mechanized, 4,719 motorized and 15,444²⁹ non-motorized. The mechanized fleet is dominated by gillnetters (1,760), and trawlers³⁰ (1,340), with maximum numbers in Balasore, Kendrapara and Jagatsinghpur Districts³¹. The important gear used are gillnets, fixed bagnets, hooks-and-lines, seines, including beach seines, and trawl nets.

The traditional fishers of Orissa are organized under the Orissa Traditional Fishworkers' Union (OTFWU), a trade union with 80,000 members (including women) across the State. It includes 10,000 fishers in the Bengali-speaking district of Kendrapara. The women also have their own organization called Samudram, a State-level federation with over 3,000 members (Sridhar 2005).

²⁸ <http://www.jsk.gov.in/orrisa/orrisa.pdf>

²⁹ The maximum number of non-motorized vessels are in Jagatsinghpur District.

³⁰ Trawlers in Orissa range from less than 30 ft to over 40 ft in overall length, with most of them within 30-35 ft range. The larger trawlers, of 38-48 ft length, also called 'Sona' trawlers, have 120 hp motors and fish for six to seven days. The Sona trawlers fish beyond 20 km, while the smaller trawlers fish within the territorial waters. The average crew size in trawlers is between six and eight. The initial investment for smaller trawlers is Rs 1,000,000, while the running cost per fishing trip is Rs 70,000..

³¹ Large gillnetters (35-40 ft in length, using 10-15 hp, with initial investment of over Rs 200,000, are located in large number in Balasore District (697) and Kendrapara District (416), while trawlers are in large numbers in Balasore (589) and Jagatsinghpur (503).

Map 3: Orissa District Map with Major Landing Centres



Marine Fisheries

The State's marine capture fish production increased from 46,840 tonnes in 1985 to 89,586 tonnes in 2006, with the highest production reported in 2005 (1,01,500 tonnes) (CMFRI 2006). The figures published by the Orissa State Fisheries Department, however, show even higher fish production (see Appendix VI).

Thirty-five per cent of the total marine fish production in 2001 was from trawlers (Mathew 2004). Trawlers also accounted for the largest share of shrimp production in Orissa. The State contributed to three per cent of India's total marine capture fish production in 2006 (CMFRI 2006). The Fishery Survey of India (FSI) has estimated the fishery potential of Orissa up to 200 m depth to be 161,000 tonnes, indicating a potential for further increase in catch (Salagrama 2008). Over the last 20 years, there has been a shift in the fish species landed, and the catch is now dominated by pelagic species³², while demersal species dominated between 1985 and 1995 (CMFRI 2006). The fishing season extends from November to April, coinciding with the turtle nesting and breeding season. The total number of fishing days is roughly 240 days a year. According to the

³² Pelagics now contribute up to 47 per cent of the total catch.

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State Fisheries Department, the State exports over 11,000 tonnes of fish and fish products valued at Rs 334.43 crore (2003-04). Dry fish is an important product that is traded both locally and to other States, particularly to the northeast, with both the trawl and artisanal sectors contributing to the trade.

Community-led initiatives for turtle protection

Some of the fishing communities near the Rushikulya river mouth area have taken the initiative, under the guidance of the Wildlife Institute of India (WII), to form the Rushikulya Sea Turtle Protection Committee (RSTPC)³³ to protect turtle nesting and breeding habitats. Besides RSTPC, there are other groups such as the Ma Ganga Devi Shanti Maitree Yunak Sangha³⁴ in Ganjam, and Green Life Rural Association in Astarang, near the Devi river mouth, which undertake similar activities. Some of these organizations have been recently involved in monitoring nesting sites with the Forest Department³⁵. Besides these, a consortium of different organizations and individuals formed the Orissa Marine Resources Conservation Consortium³⁶ (OMRCC) in 2004, to look at sea turtle conservation measures and/or sustainable fisheries in Orissa (Sridhar and Gopal 2005). Through the OTFWU, traditional fishing communities have, since 2004, volunteered to ban the use of three types of gillnets, namely, *sankucha jal* (ray net), ring seine and *bhetki/bahal jal*, which they felt were a threat to the turtle population.

Part III: Implementation of Turtle Protection Measures: Community Concerns

Vessel seizure and arrest of fishers

Fishing communities are affected by the manner in which protection measures are being implemented, which often lead to confiscation of vessels and arrest of crew³⁷. Currently, there are 58 cases in various district and sub-district courts of Kendrapara, for violations in the forests of Mahakalpada range, adjoining the Gahirmatha (Marine) Wildlife Sanctuary.

Fishers whose vessels are confiscated say that the legal process is lengthy and it takes anywhere between two to 11 years to get the vessels released. The time consumed and the related financial burden is a huge problem for the fishers. Often when the vessels are released, they are in such poor condition that they cannot be used again for fishing. In this context, it is worth noting that the CEC recommendations call for safe custody of vessels seized. There has been an increase in the number of gillnetters seized in recent years (as

³³ The 37 members of the RSTPC are involved in sensitizing the villagers along the Rushikulya river mouth on the need for protection, especially to stop collecting turtle eggs and to protect nesting habitats. They also take up education and awareness campaigns among the local villagers and school children (Sridhar 2005, Tripathy 2004). One of the proposals of RSTPC is to declare the Rushikulya nesting beach as a protection reserve where traditional communities can be involved in protection activities, especially monitoring and protecting the nesting grounds.

³⁴ It is another trust in Punabandra, Ganjam district, registered in 2000, with 20 members.

³⁵ They are paid Rs 70 per day when they work for the Forest Department. They now demand Rs 100-200 per day for the daily wage labour work undertaken for the Forest Department.

³⁶ It including fishworkers' unions of Orissa, conservation organizations, development NGOs, turtle biologists and individuals.

³⁷ Section 51 of the WLPA makes provisions for the Forest Department to arrest people and seize vessels for violation of regulations. The cases are first brought to the sub-divisional magistrate, then to the District Court and then to the High Court.

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also reported in Forest Department records, see Appendix III). Trawlers from Orissa and outside the State have also been arrested for illegal entry into the prohibited area. In such cases, the crew undergoes simple imprisonment for one year, or a fine of Rs. 3,000 plus simple imprisonment for three months, according to the judgement in one of the latest cases. It is not clear, however, if records of confiscation are an indicator of better enforcement of protection measures.

The WLPA makes provisions for innocent passage of vessels in PAs within territorial waters, but the actual implementation is problematic, as it is often difficult for fishers to prove their innocent passage. In a recent Kendrapara District court judgement³⁸, it was highlighted that fishers cannot be arrested and vessels confiscated if the gear and catch are inside the vessel, as this indicates that they are not actually fishing. Fishers say that vessels are often apprehended in the Core Area, when they are navigating through it to reach the landing centre after a fishing trip. Fishers also state that the lack of boundary demarcation sometimes makes it difficult for them to determine if they are inside the sanctuary waters or not.

Firing incidents

Patrolling of the sanctuary waters, meant to deter violators from fishing there, is often difficult, as patrolling officers cannot differentiate between fishing vessels that are fishing inside the sanctuary and those that are exercising their right of innocent passage through the sanctuary. This sometimes leads to conflicts between fishers and patrolling officers, and in two instances, unfortunate accidental firing leading to the death of two fishers in 2005/06—a fisher on board a gillnetter from Kharinasi and a fisher on board a trawler³⁹ from Kaddwip were the unfortunate victims. An inquiry into the incident revealed that these fishers were, in fact, on board fishing vessels exercising their right of innocent passage through the sanctuary.

The compensation of Rs 100,000 provided to the families of the killed fishermen is inadequate. In the case of the gillnet fisherman, his family, comprising his wife and four children, were completely dependent on him. Following his death, the fisherman's wife was forced to take up a different occupation to sustain the family, given the insufficient compensation received. This incident has created a negative perception among fishing communities about the role of patrolling officers.

³⁸ The case was filed under U/S 148 IPC, U/S 307 IPC. U/S 161 Cr.p.c, U/S 141 of IPC. S.T. Case No. 62 of 2006 arising out of G.R. Case no. 2 of 2006, corresponding to Rajnagar P.S case No.1 of 2006 being committed by the J.M.F.C., Pattamundai. The recent judgement in Kendrapara court: State of Orissa vs Chandan das, Naren Dey, Sunil Mendel, Sankar Das, Jatindra Das, Shyamapad Roy, Sukumar Das, Ekadesi Dhada, Nani Gopal Das, Banameli Das, Basanta Das, Rabin Das, Subash Das, and Mihir Banarjee, In the Court of the Additional District and Sessions Judge, Kendrapara, dated 28 November 2008.

³⁹ The judgement says 'trawlers' but uses 'gillnets' at one point; newspaper reports use the term 'trawler'.

Part IV: Social Consequences of Turtle Protection Measures

The implementation of turtle protection measures has had severe social impacts on fishing communities living along the coast of Orissa⁴⁰, one of the poorest States in India. This section expands on this issue.

Loss of livelihoods

Fishing restrictions and regulations have reduced the actual area available for fishing, and the number of fishing days as well as access to fishing grounds.

Orissa has a coastline of 480 km and 10,560 sq km of territorial waters. Of the latter, almost 2,400 sq km are closed to trawling operations (as part of OMFRA), another 1,408 sq km of the water body are closed to fishing operations as part of the Gahirmatha sanctuary, while a 20-km radius from the river mouth in Bhitarkanika and another 10 km from the other two river mouths are also closed to motorized and mechanized fishing. Thus, almost 50 per cent of Orissa's territorial waters are closed to fishing by motorized and mechanized vessels⁴¹. These measures have affected over 3,400 motorized and non-motorized fishing vessels in five districts, besides the mechanized gillnetters and trawlers.

The number of actual fishing days has also reduced drastically as the peak fishing season from November to April coincides with the period of turtle congregation and nesting, during which fishing is highly restricted. The number of fishing days is, therefore, effectively reduced from 240 days to less than 100. Moreover, access of fishers to the sea from three landing centres—Rajnagar, Tantiapal and Jambu—has been affected, as the fishers have to pass through the sanctuary limits in order to access to the sea (see Maps 2 and 3). The seven fish landing centres located in the fringe of the sanctuary are Dhamra, Talchua, Rajnagar, Tantiapal, Jambu, Kharnasi and Paradeep.

Active fishers affected

The fisheries department has recently estimated that 26,861 active fishers, using motorized and non-mechanized fishing craft, are affected due to prohibitions on fishing, across five districts⁴² adjoining the three nesting beaches (Department of Fisheries 2007). This has, in turn, affected a total of over 100,000 fisherfolk who are dependent on the active fishers in 216 fishing villages. Of those active fishers affected, as many as 43 per cent (11,809) are below poverty line(BPL)⁴³, with Mahakalpada block in Kendrapara District, near the sanctuary, having the largest numbers of affected fishermen (3,483). It

⁴⁰ The Orissa State Human Development Report shows that Orissa is one of the poorest States in India, with a human development index of 0.404.

⁴¹ Mathew (2004) reported that 54 per cent of the area was closed, as earlier the Notification read 20 km distance as closed to fishing in the Rushikulya and Devi river mouth area, but at present it is 10 km.

⁴² The five districts are Jagatsinghpur, Kendrapara, Bhadrak, Puri and Ganjam. The blocks affected are Kujang, Earsama, Balikuda (Jagatsinghpur); Mahakalpada, Rajnagar (Kendrapara); Chandabali, Tihidi (Bhadrak); Astarang, Kakatpur (Puri); and Ganjam and Chhatrapur (Ganjam).

⁴³ In India, BPL is estimated using 13 scoreable socioeconomic parameters: operational holdings of land, housing, clothing, sanitation, ownership of consumer durables, literacy, labour force, means of livelihood, status of children, type of indebtedness and migration.

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is worth noting that these figures estimate only the active fishers affected by conservation initiatives—there is, however, also an impact on those employed in allied activities.

So far there has been no systematic initiative to either compensate active fishers for the loss of livelihoods or to provide alternate or longer-term alternative livelihood options. Although there is a proposal before the Department of Fisheries to financially compensate fishers by paying Rs 150 per day for a full-time fisher and Rs 75 per day for a part-time fisher for a period of 180 days, the scheme has yet to be implemented⁴⁴.

Impact on women

It is not just the active fishers who are affected by sanctuary regulations—women who are actively involved in post-harvest and marketing activities are also directly affected. For example, women from Ganjam and Jagatsinghpur Districts who are engaged in the dry fish trade, an important source of livelihood, are indirectly affected as catches have declined due to restrictions on fishing (Sridhar 2005).

The direct impact of sanctuary regulations is also felt by women in Kendrapara District who are actively involved in crab collection and fishing in the creeks and mangrove waters along the Bhitarkanika wildlife sanctuary and in the Reserve Forests in the Gahirmatha (Marine) Wildlife Sanctuary. Crab collection and fishing in the creeks are important sources of daily income for the women. Some women have taken up this work recently, as incomes from fishing have declined and, being landless, they can only work as daily wage labourers. However, sanctuary regulations prohibit them from collecting crabs or fishes along the creeks, as they are part of the Reserve Forests within sanctuary limits. Women report that, in some instances, they have no option but to pay a fine of about Rs 500, at least twice or thrice a year, to enable them to continue fishing. In cases where they are unable to pay the fines, their nets may be confiscated on the spot.

Even where women are not directly involved in fishing-related activities, the decline in family incomes due to restrictions on fishing forces them to look for other sources of income, such as through daily wage labour, which leads to an increase in their workload (Sridhar 2005, Aide et Action 2008). The social impact of turtle protection measures on women are, however, often overlooked by the Forest and Fisheries Departments, as there is no gender-segregated data on the number of people affected, directly and indirectly.

High levels of indebtedness and reports of suicide

The restriction on fishing has led to a livelihood crisis, and many fishers report high levels of debt due to declines in their incomes and their inability to pay back loans. The problem is further aggravated by the lack of access to formal credit. With the initial investment in fishing vessels⁴⁵, and the running costs⁴⁶ being beyond their means,

⁴⁴ Livelihood assistance for traditional fisherfolk of Orissa: Detailed proposal from the Joint Secretary to the Government, No. 7 FF-Sch-30/2004, dated 14 July 2005, submitted to the Special Secretary to the Government, Forest and Environment Department.

⁴⁵ The initial investment in the mechanized gillnet fishing unit (35-40 ft in length, using 10-15 hp motors) is over Rs 200,000, as the mechanized fishing vessel cost Rs 1.5 lakh, and the fishing gear costs around Rs 30,000, plus other accessories.

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informal credit through private moneylenders⁴⁷ has been the main source of finance for fishing operations. These moneylenders, who also double up as fish merchants, take the catch from the fishers at below-market prices, as part settlement of the loan amount; indebted fishers sometimes take over 20 years to fully repay their loans.

The high levels of indebtedness among fishers, who have little chance of repayment, given the restrictions on fishing, have even led to some fishers committing suicide. There are also reported instances of mental illness arising from financial stress. It is reported that seven fishers⁴⁸ in Kendrapara have committed suicide since 2005 (Lahangir 2005). The fishing boats of all the seven fishers had been seized for violating sanctuary regulations. The loss of fishing vessels and gear, the complex legal procedures, and the outstanding loans, have all combined to aggravate the financial burden of the fishers and drive them to such extreme steps. Their families are now struggling to survive, with the women in the household being forced to look for other livelihood options (Lahangir 2005). In 2006, the reports of suicides received the attention of the National Human Rights Commission (NHRC), which directed the Collector of Kendrapara District and the State government to submit a report after inquiring into the cases. The inquiry report submitted by the District Fisheries Department official to the State said that the livelihoods of fishermen are affected by the ban on fishing and declaration of the sanctuary.⁴⁹

This section has highlighted some of the social issues that have risen as a consequence of protection measures—issues that need to be urgently and sensitively addressed, in the interests of social justice and equity. This would also be in keeping with Section 26A of the WLPA, which highlights the need to take measures to protect the occupational interests of local fishermen in sanctuaries and the need to protect the right of innocent passage of any vessel or boat through the territorial waters.

Part V: Conclusion

The adoption and implementation of turtle protection programmes under the forests and fisheries legal frameworks in Orissa (WLPA and OMFRA) have increased the number of prohibitions and regulations affecting, among other things, traditional and small-scale fishing operations, leading to reduced access to fishing grounds and the actual number of fishing days for fishing communities. The social consequences—both direct and indirect—that the fishing communities have to live with are many. They range from loss of livelihoods due to reduced access to fishing grounds to lengthy legal processes that affect the socioeconomic status of fishers.

⁴⁶ The running cost per trip during a fishing season is Rs 5,000-6,000, which includes the cost of fuel, ice and food.

⁴⁷ Known as “*maja*”

⁴⁸ Five from Kharinasi and two from Ramnagar. While seven suicides have been reported, official records show only two, as First Information Reports (FIR) were not filed by the police for the other five due to cultural beliefs.

⁴⁹ Submission of inquiry report on the suicide case of Sri Budhananda Saraswati of Mahakalapara Block, dated 15 December 2006, by the Assistant Director of Fisheries (Marine), Kujang, Jagatsinghpur.

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There are still no clear indicators, so far, to show that turtle populations have indeed been restored or maintained, even after years of adopting protection measures. There is no direct causal relationship to prove that fishing regulations have proven effective, as the number of nesting populations and mortality rates do not provide much insight into the issue. Turtle mortality and the decrease in turtle populations could also be due to other factors that need to be further examined carefully.

Turtle conservation measures, with their negative impacts on lives and livelihoods, have alienated fishing communities, who feel targeted and excluded,. Fishers across Orissa, including those involved in allied activities, are affected by the protectionist measures. The fishing communities, located in remote areas without access to basic facilities, and with no access to other sources of livelihood, are made more vulnerable and marginalized by these protection measures. It is essential to look for alternative approaches, and move from an 'exclusionary protectionist mode' to an 'inclusive conservation mode', to restore and maintain turtle nesting populations, and ensure sustainable use of fisheries resources.

Part VI: Recommendations

There can be little doubt about the significance of conserving sea turtles, an important flagship species, and their habitat, within a wider coastal and marine management framework. There can also be little doubt about the importance of taking into account social issues while implementing conservation and management measures. Some measures that can be undertaken to address these issues are proposed below:

1. Implementing existing legal provisions

OMFRA

Fishing communities have long highlighted the need for effective implementation and enforcement of provisions in the OMFRA, pointing out that doing so could also meet the goals of turtle conservation.

- a) There is particular need to enforce the 5-km 'trawl-free' zone, to help protect the livelihoods of small motorized and non-motorized fishers, and reduce turtle mortality due to trawling operations. Both large and small trawlers, from within Orissa and outside, should comply with such measures.
- b) There is need to develop a fisheries management plan, identifying measures such as registration of vessels, catch and position reporting by fishing vessels, besides other fisheries management measures like closed areas, within the OMFRA framework, for effective conservation and management of fisheries resources at a wider level. Attempts should be made to bring greater coherence between forest and fisheries management plans in areas where there are interactions between fisheries and turtle aggregations.

As financial constraints are often stated as limitations for implementation of these provisions, a separate budget head would help in assisting the process. While there has been efforts by the Government of Orissa to have a separate budget head for sea turtle conservation, it has not yet been implemented.

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WLPA

As discussed earlier, there are specific provisions of the WLPA that are important for fishing communities, which should be addressed in consultation with the Fisheries Department and representative bodies of fishing communities:

- a) Occupational interests: Specific guidelines need to be developed, in a participatory manner, to elaborate on how the occupational interests of local fishers could be protected, and to better enable Forest Department personnel to formulate and implement regulations accordingly.
- b) Innocent passage: Passes could be provided to fishers to exercise their right of innocent and safe passage⁵⁰. Navigational channels for innocent passage could be demarcated within the sanctuary limits and marked on maps, which could also be distributed to fishers to assist their easy passage.
- c) Advisory committee: An advisory committee should be set up, with representatives of local *panchayats* and NGOs as members, to render advice on measures for better conservation and management, to address concerns of communities and ensure better collaboration between the different agencies and fishing communities.
- d) Participatory provisions in PAs: As mentioned earlier, recent amendments of the WLPA (2002, 2006) have identified new categories of PAs, such as Conservation Reserves, Community Reserves and Tiger Reserves, which have specific provisions for the involvement of communities in their management. While there are current proposals to declare Rushikulya and Devi as sanctuaries, it could be worthwhile to explore if these could, instead, be declared as Conservation Reserves, to reduce conflicts and ensure conservation effectiveness (Kartik and Kutty 2005). According to the WLPA (2002), Conservation Reserves can be particularly declared in areas adjacent to existing sanctuaries and National Parks.
- e) While the provisions for declaring Community Reserves are inclusive, one of the important lacunae is that such reserves can only be declared in private or community land, which is not applicable to the marine space. Thus, an amendment to the WLPA should be considered, especially for Community and Conservation Reserves to be declared in marine and coastal ecosystems, as they provide a more 'inclusive' approach.
- f) In a marine and coastal protected area context, it would be useful to draw from the category of Tiger Reserves, designated as per Section 38V of the WLPA (2006). This has specific provisions that state that Core Areas should be designated on the basis of scientific and objective criteria, without affecting the rights of the Scheduled Tribes or such other forest dwellers, while Buffer Areas should be identified and established to ensure the integrity of the critical tiger habitat, and aim to promote co-existence between wildlife and human activity, with due recognition of the livelihood, developmental, social and cultural rights of the local people. It is also stated that the limits of such areas are to be determined on the basis of scientific and objective criteria, in consultation with the concerned *gram sabha* and an expert committee constituted for the purpose. Given the unique nature of the coastal and marine ecosystem, it is worth considering a specific category for marine and coastal

⁵⁰

Also a CEC recommendation.

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protected areas, with due recognition of the livelihood developmental, social and cultural rights of local fishing communities.

2) *Monitoring and enforcement*

- a) It would be useful to provide for participation of fishers in enforcement activities, along with Forest and Fisheries Departments and the Coast Guard, as it could also reduce conflicts between enforcement agencies and fishers, as well as remove feelings of alienation and victimization. Though there is no existing provision under the WLPA or OMFRA, this could be of benefit in the long run as highlighted in the CEC recommendations.
- b) Vessel Monitoring Systems (VMS) could be installed for larger fishing vessels to facilitate monitoring and tracking. Smaller fishing vessels could be provided with a map showing the limits of the prohibited areas, with a global positioning system (GPS), so that they can identify these areas. Fishers can also be trained to use these equipments and to read and understand the markings on the maps.

A combination of measures undertaken by the Forest and Fisheries Departments, such as demarcating innocent passage with navigational channels, with passes to fishers, and with appropriate training to use marked maps, combined with VMS and GPS, if implemented properly, might facilitate the reduction in the number of vessels confiscated, and arrests made. While efforts are being made by the Government of Orissa to develop programmes and schemes along these lines, operationalizing them is still problematic, as there is need to learn and incorporate the best practices followed in other countries.

3) *Improving conservation effectiveness*

While efforts for protection of turtle populations have intensified in recent years, there are, as yet, no clear-cut indicators that these measures have been effective:

- a) There is need for scientific studies to better understand the various fishery and non-fishery factors that lead to turtle mortality, and to regulate these factors on a long-term basis. It is important to regulate other development activities such as construction of minor and major ports, sand mining, starting casuarina plantations on nesting beaches, aquaculture and other industrial activities that also pose a threat to turtle populations. These measures would help address conservation objectives from a long-term perspective.
- b) Studies also need to be undertaken to identify turtle aggregation zones in the offshore areas, demarcating clearly the zones that need to be protected. This would also be useful in looking at other options, such as providing protection to these zones on a dynamic basis, following the movement of turtle congregations (Pandav, quoted in Mathew 2004). These studies should not be restricted to turtle populations, but should also focus on other marine species found within the PA.
- c) Fishing communities need to be involved in monitoring of nesting beaches and identifying the aggregation zones during the turtle season, and should be provided with sufficient compensation. As mentioned earlier, fishing communities in some areas are already engaged in such work, and there is need for greater recognition of such initiatives and support for them. There is need to recognize that such participatory approaches can enhance conservation by stimulating self-regulation by

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communities. The OTFWU, for example, has suggested that if their livelihood interests are considered, they would willingly undertake community-regulated management measures such as rotational access to fishing grounds, limited entry for fishing vessels, ban on use of all destructive gear and use of only 'turtle-friendly' nets. The OTFWU and the Orissa Marine Fish Producers Association have suggested that sanctuary limits need to be re-notified based on recent scientific information on turtle aggregation zones and taking into consideration the livelihoods requirements of fishers. They have suggested a more practical approach to conservation that limits the effective area of the sanctuary to 10 km from the coastline, rather than the current 20 km, with a Core Area of 5 km and a Buffer Area of another 5 km beyond the core. They point out that this approach would enable some of the smaller mechanized vessels to fish in waters beyond 10 km, and open up more fishing grounds. The viability of such suggestions need to be evaluated, based on scientific studies.

4) Regular committee meetings

The Government of Orissa should **continue to** ensure that the Task Force Committee and the High Power Committee that have been formed with community representation, meet on a regular basis, to develop concrete measures for turtle conservation and to address the livelihoods concerns of the fishing communities. **The fishworker organization representatives should also be given power to influence the decision-making process** so that their suggestions and demands are also taken into consideration.

5) Addressing livelihood issues

The livelihood options proposed must take into account the community's low skill sets, low levels of education, and the poor availability of basic services. Some suggestions follow:

- a) Studies are needed to put together comprehensive and gender-disaggregated data about the socioeconomic situation of communities in the affected areas, and to identify key social issues of concern. Such data should be used for monitoring purposes, to ensure that there is an overall improvement in the socioeconomic status of men, women and children of communities in conservation areas.
- b) Access of fishing communities to basic services must be enhanced. It is thus important that there is better co-ordination with departments of education, health and rural development, for the overall development of these areas.
- c) Long-term livelihood options, where needed, should be developed in consultation with the affected communities, with a specific gender focus, taking into consideration the skills, needs, vulnerabilities and responsibilities of the fishing community. **Skill upgradation through quality education and other skill-enhancing opportunities is necessary to help fishers diversify into other livelihood opportunities.** The task force formed could play an important role, working in co-ordination with the forest, fisheries, education and rural development departments, as well as with NGOs working on livelihood issues and other interested parties. Long-term livelihood strategies could include a range of alternate livelihood options for the present generation (within fishing or in other fishery-related fields), and alternative livelihoods for future generations. While short-term options must include compensation for fishing days lost, and employment opportunities through the

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National Rural Employment Guarantee Scheme (NREGS), long-term options must be viable and acceptable. One of the options could be the coastal biovillage model that relies on the sustainable use of natural resources and shifting from unskilled to skilled labour. If options like ecotourism are proposed, specific policies to ensure that communities actually benefit from them must be put in place, and appropriate training provided.

6) Training and capacity building

- a) There is need for training and capacity building of Forest and Fisheries Department officials, particularly on social issues in, and participatory approaches to, conservation. This would improve relations, and enable better communication and collaboration towards common objectives of better management.
- b) There is also need to build greater awareness among fishing communities about the importance of turtles to the marine ecosystem, and measures that are needed to protect turtle populations. Communities also need to be informed clearly about the rules and regulations that are in place.

While the abovementioned measure need to be addressed in the short term, over the longer term, it is important to move towards a comprehensive marine and coastal conservation and management policy framework. This should take into consideration India's international obligations under the Convention on International Trade Convention on Migratory Species (CMS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the United Nations Convention on the Law of the Sea (UNCLOS). It should specifically take into consideration the Convention on Biological Diversity (CBD), and the Millennium Development Goals (MDG) (Goals 1 and 7 in particular), to ensure that conservation and sustainable use of resources also contribute to poverty alleviation. Other important instruments are FAO's Code of Conduct for Responsible Fisheries, and the Indian Ocean-South East Asian Marine Turtle Memorandum of Understanding, a regional instrument that recognizes the need to protect, conserve, replenish and recover turtles and their habitat, taking into account socioeconomic and cultural characteristics.

This framework should provide for a comprehensive approach to conservation and management of coastal and marine resources, including sustainable use of fisheries resources. It should provide for conservation of habitat and of species through an integrated approach, using a combination of measures, which may also include closed areas, if they are based on proper scientific studies, as one of the available management tools. It is as essential that internationally agreed goals related to poverty alleviation and improving the well-being of communities underpin such a framework. This would be consistent with the interpretation by the Supreme Court of India that the right to life includes the right to environment and livelihood⁵¹. These approaches could help contribute towards restoring and maintaining turtle populations, and the well-being of local communities.

⁵¹ Bakshi, P.M. 2006. The Constitution of India. Delhi, Universal Law Publishing Co. Pvt. Ltd, 2006.

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In conclusion, we need to move towards an approach that balances protection of turtles with the sustainable use of fisheries resources. There should be greater recognition of the legitimate access rights of fishers, and **there should be interest in adopting a co-management approach**, ensuring the full and active participation of fishing communities in decision-making processes.

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References

- Aide et Action. 2008. Seeking substitutes: Study report on “Alternative livelihood vocation for the marine fishermen affected due to turtle conservation measure, in Orissa Coast”. Submitted to United Nations Development Programme.
- Bakshi, P.M. 2006. The Constitution of India. Delhi, Universal Law Publishing Co. Pvt. Ltd., 2006.
- Central Marine Fisheries Research Institute. 2006. Marine Fisheries Census 2005 Part III (2)- Orissa. Ministry of Agriculture. Government of India, 2006.
- Government of India. 2005. Recommendations of the Central Powered Committee based on field visit from February 10-14, 2005.
- Government of Orissa. 2005. Human Development Report 2004: Orissa. Bhubaneswar, Planning and Coordination Department, Government of Orissa. Available online at <http://orissagov.nic.in/p&c/humandevlopment/index.html>
- Government of Orissa. 2007. Management plan. Gahirmatha (marine) wildlife sanctuary for the period: 2008-09 and 2017-18 (Draft). Mangrove Forest Division (Wildlife), Rajnagar, Kendrapara, Orissa.
- Government of Orissa. 2008. An overview of exploring possibilities of cooperation on investment and technical collaboration with Norway and Iceland. Powerpoint presentation. Bhubaneswar, Department of Fisheries. Orissa
- Greenpeace. 2008. Orissa: Turning seas of trouble into seas of plenty. Bangalore, Greenpeace. 15p.
- Lahangir, Sarada. 2006. Conservation: Life studies. SAMUDRA Report 43. March 2006.
- Kothari, Ashish and Milind Wani. 2007. Conservation and people’s livelihood rights in India. Final Report of a Research Project Conducted Under the UNESCO Small Grants Programme. Available online at: <http://www.kalpavriksh.org/f1/f1.2/UNESCO%20CNL%20project%20final%20report.pdf>
- Mathew, Sebastian. 2004. Socio-economic aspects of management measures aimed at controlling sea turtle mortality: a case study of Orissa, India. Paper presented at the Expert Consultation on Interactions between Sea Turtles and Fisheries within an Ecosystem Context, Rome, 9-12 March 2004. FAO Fisheries Report No. 738, Suppl. Rome, Food and Agriculture Organization of the United Nations (FAO), 2004. 238p. Available online at: <http://www.fao.org/docrep/007/y5750e/y5750e0d.htm>
- Salagrama, Venkatesh. 2008. India: Marine fisheries sector study-Background paper for Orissa State.
- Salagrama, Venkatesh. 2006. Trends in poverty and livelihoods in coastal fishing communities of Orissa State, India. FAO Fisheries Technical Paper 490. Rome, Food and Agriculture Organization of the United Nations (FAO). 2007. 100p.

International Collective in Support of Fishworkers

Secretariat of the Convention on Biological Diversity (2006). India's Third National Report to the CBD. Montreal, SCBD, 2006.

Shanker, Kartik and Roshini Kutty. 2005. Sailing the flagship fantastic: different approaches to sea turtle conservation in India. In Frazier, J. (Ed.) MAST/ Maritime Studies Special Issue: Marine turtles are flagships 3(2)/4(1): 213-240

Singh, H.S. 2002. Marine protected areas in India: Status of coastal wetlands and their conservation. Gandhi Nagar, Gujarat Ecological Education and Research Foundation (GEER), 2002.

Sridhar, Aarthi. 2005. Sea turtle and fisheries in Orissa, India. SAMUDRA Monograph series. Chennai, International Collective in Support of Fishworkers (ICSF). 40p.

Sridhar, Aarthi and Sanjiv Gopal. 2005. The OMRCC update- news on India's first collaborative marine conservation initiative. Indian Ocean Sea Turtle Newsletter 2: 9-10.

Tripathy, Basudev. 2004. Awaiting arribadda: Protection of olive ridley turtles (*Lepidochelys olivacea*) and their habitat at Rushikulya rookery in Orissa. Wildlife Trust of India. 2004.

Tripathy, Basudev and Bivash Pandav. 2007. Beach fidelity and inter-nesting movements of olive ridley turtles (*Lepidochelys olivacea*) at Rushikulya, India. Herpetological Conservation and Biology 3 (1): 40-45

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Appendix I

Recommendations of the Central Empowered Committee (2004)⁵²

3. Remedial measures:

After considering all the relevant factors and after acquainting ourselves with many of the problems on the ground the following observations are made with reference to:

- a. Restrictions on trawlers and monitoring of their activities
- b. Restrictions in Gahirmatha Sanctuary
- c. Traditional fishermen
- d. Aquaculture activities
- e. Infrastructure and personnel
- f. Coast Guard/DRDO
- g. Restrictions on lighting in turtle nesting areas
- h. Threats
- i. Removal of casuarina plantations

These measures are a further elaboration, in operation terms, and also reiteration of the interim directions issued by CEC on 7th March 2003 in Application No. 48.

3.1 Restrictions on trawlers and monitoring of their activities

3.1.1 "Trawlers" should be prohibited from fishing from 1st November to 31st May upto a distance of 20kms towards the sea from the high tide line at the mass nesting sites of Gahirmatha, Devi River Mouth and Rushikulya. The Coast Guard may be requested to stipulate the coordinates for the exclusion zone. In this connection may also refer to Govt. of Orissa's Notification No. 7 Fy. Sch. 20/2002 10966/FARD, dated 7th June 2002

3.1.2. All boats must have the registration/licence number/name boldly displayed so as to be visible from air and sea to facilities checking by Coast Guard vessels and helicopters. The boats should also carry a laminated water proof chart duly certified by the captain and countersigned by the local fisheries officer regarding the permitted number of nets, types of nets and length of nets (in case of gill nets) it carries, or plans to use.

3.1.3. The monitoring units and staff of the Forest and Fisheries Department must immediately ensure that surprise inspection of boats on land prior to heading out to sea is done with reference to length and type of net, validity of licence and identification markings. All boats should carry original fishing licence with them for verification purposes. The excuse that the original is with the owner at the fishing base should not be accepted. If any boat on inspection at sea is found not using a TED or has stitched shut the escape hatch of the trawl net, its licence should be cancelled, the boat impounded and a fine levied for the first offence. Any subsequent offence must be liable to a punitive fine. The money thus collected should be deposited with the Forest Department in a dedicated amount to be used for turtle protection

3.1.4. The vessels/trawlers and gill nets which are seized should be kept in a safe and secure place for which necessary facilities on land is a must at each of the three nesting sites at Gahirmatha, Devi and Rushikulya

3.1.5. It is also essential that there is proper coordination with the public prosecutors with a view to ensure that trawlers owners do not reclaim their vessels after paying token fine in court. A special public prosecutor needs to be appointed to deal with this problem. This has become all the more urgent as it has been reported that on the night of 17th February 2004, as many as 62 vessels were seized in the Devi River Mouth where illegal trawling is acute.

1. Devi Patrol Camp, where illegal trawling is also acute, should be headed by the Coast Guard with Forest and Fisheries Officials deputed to the team.

⁵² The recommendations were in response to the Application No. 46, filed on 19 December 2002 by Mr. Alok Krishna Agarwal, regarding protection of endangered olive ridley sea turtle in Orissa.

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3.2. Restrictions in Gahirmatha Sanctuary:

3.2.1. The present restrictions on all fishing inside Gahirmatha Sanctuary must remain. These restrictions are not merely for turtles, but also for dolphins, fish, prawns, crabs etc, so as to preserve their breeding grounds. No fishing of any kind should be allowed inside the core area of the marine sanctuary. However, traditional fishermen may be granted passage through the core area by the Forest Department, on the basis of passes issued to local boats only. The Coast Guard and the DRDO will have to ensure that no fishing vessel enters the marine sanctuary area.

3.3. Traditional Fishermen

3.3.1. Fishing by traditional, non-motorized gillnet vessels (namely vessels without inboard or out board engines and without mechanized fishing gear) may be permitted within 5 km of the High Tide Line in all areas, including near the three nesting beaches. However, the nets used by such vessels must be small mesh, monofilament nets with a maximum length of 300m.

3.3.2. Fishing by traditional vessels (vessels without in-board or out board engines and without mechanized fishing gear) using small mesh, monofilament nets with a maximum length of 300m. may be permitted inside the turtle congregation zones. This is subject to a restriction on the total number of vessels fishing in the zone simultaneously. No motorized vessels, trawlers or those using mechanized fishing techniques should be allowed in congregation zones.

3.3.3. Motorized gill netters may be permitted within 5km of the HTL, except in the 5 km exclusion zone around the Devi and Rushikulya mass nesting sites. However, nets used must be small mesh size, monofilament nets of a maximum length of 300m. Under no circumstances must be multifilament large mesh size nets be used.

3.3.4. The limits spelt out above should be clearly spelt specified with longitude/latitude details. OMFRA should be modified accordingly to incorporate these recommendations.

3.3.5. Three types of gillnets cause turtle mortality namely Sankucha jaal (Ray net), Ring seine and Bhekti/Bahal jall. The Orissa Traditional Fish Workers Union has voluntarily decided to give up the use of these three types of nets during the turtle season. This gesture on their part is welcome. In addition, all gillnets of 140mm and above, whether monofilament or multifilament, should be prohibited in Orissa, until there is sufficient proof that they are not a threat of turtles. However, strict enforcement of this should continue to be the responsibility of the officials of the Fisheries and Forest Departments with necessary assistance wherever required from the police and the Coast Guard.

1. In the Gahirmatha sanctuary area, the tourists should travel in traditional boats and not motorized boats. This will also enhance the employment opportunities and income of the local population.

3.4. Aquaculture activities

3.4.1. No intensive aquaculture should be permitted in the following areas:

a) Within 5km. along the coast and inland from the boundaries of the Gahirmatha sanctuary and the Bhitarkanika National Park.

Aquaculture farms are present at the Mahanadi river delta in Mahakalpada Tehsil within 5 kms of the coast. Some of them are as large as 300 to 500 acres. These are also present close to the boundaries of the Bhitarkanika National Park within 5 kms.

b) Along the entire coast and upto 5km. inland from Hatadhar river to Rushikulya river mouth. Existing facilities falling in these areas should immediately be shut down and demolished by the Forest and Revenue Departments (in case of revenue lands) and the natural drainage should be restored.

3.4.2. Illegal prawn seedling harvest is taking a heavy toll of fish resources on the Orissa coast. As much as 95 per cent of the catch may be discarded on the beach and left to die, severely impacting the recruitment of wild fish, crab and shrimp populations. Though the OMFRA 1982 bans such an activity, adequate steps are not being taken to curb this huge illegal trade in shrimp seedlings. The Fisheries Department should check this menace through setting up of checkpoints in the coastal road network as well as the national highways and crack down on the traders who reportedly transport these stocks by vehicles. They should also carry out raid at all stores and stocking points along the coastal areas near rivers, creeks and sea beaches where traders procure and keep these live seedlings. The Forest Department should check such activity inside the limits of any wildlife sanctuary or national park situated in the coastal area.

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3.5. Strengthening of Infrastructure and Personnel:

3.5.1. It is imperative that armed police personnel are permanently deployed at Gahirmatha, Devi and Rushikulya with immediate effect as recommended in the interim directions of CEC in its order dated 7th March 2003.

3.5.2. Last year there was one case of death of a forest guard after altercation with gill net operators in Gahirmatha. Forest officials particularly those in the field need to be conferred with powers to use fire arms in the course of discharging their duties. They should for this purpose be imparted necessary training before arms are issued to them. This could be on lines in Tamil Nadu. The Home Department of the Government of Orissa should take necessary initiatives in this regard in coordination with the Forest Department.

3.5.3. An amount of rupees one crore which was given by the Indian Oil Corporation for turtle protection has been lying unutilized for four years. Since the mechanisms for use of the funds has been finalized by the Forest Department, the execution of the protection plan, including acquisition of equipment and patrol boats should be completed before the start of next nesting season.

3.5.4. Another amount of rupees one crore has been given by the Ministry of Agriculture to the Orissa Fisheries Department to purchase fast patrol boats. It is imperative that the shallow and high sea patrol boats are acquired urgently so that they can be utilized to patrol the number of fishing zones in Gahirmatha, Devi and Rushikulya during the next season.

3.5.5. At least two fast boats must be located at each site, one of which could be used to undertake night patrolling during the turtle congregation and nesting period. These fast patrol boats should have Global Positioning System (GPS) fitted to identify the location of errant fishing boats. The staff should be adequately trained in reading marine maps and know their locations and distances from the boundaries of prohibited fishing area. For this purpose the help of the coast guard should be taken. There is need for close rapport amongst the officials of Forest, Fisheries and the Police Departments as also the Coast Guard.

3.5.6. All the vacant field posts in the Orissa Forest Department in the areas concerned with the turtle and coastal habitat protection should be filled immediately. Sufficient number of daily wages should be recruited for the turtle season from the local fishing community in the three mass nesting areas to enable proper protection and close monitoring of nesting/mortality. The patrol staff should be dedicated and should not be entrusted with other duties so that they are able to efficiently carry out protection of nesting turtles. The schedules should be worked out and patrolling should be done shift wise. Incentives should be paid to them by way of special allowances

3.5.7. The Government of Orissa and the Fisheries Department should under OMFRA should authorize and confer powers on the Forest Range Officers also as has been done in the case of Assistant Conservator of Forests. This has to be done urgently as it is the Forest Range Officers who operate at the cutting edge level.

1. Patrol staff to be given training to enable identification and differentiation between different fishing gear.

3.6. Coast Guard/DRDO

3.6.1. Coast Guard may be requested to place marking buoys to specify the congregation zones and the 5 km limits the mass nesting sites. They may intensify patrolling (during period 1st November to 31st May) in these areas both during day and night. They may also carry out aerial reconnaissance to detect illegal trawling.

3.6.2. The Forest, Fisheries and Police Department of Government of Orissa should institute measures immediately with Coast Guard/DRDO to establish permanent lines of communication which will ensure better coordination.

3.7. Restrictions on lighting in turtle nesting areas:

3.7.1 An action plan should be put in place for “blackout” practices on Wheeler island from January 1st to 31st May every year during the mass nesting and emergency of turtle hatchlings. This needs to be done in coordination with the DRDO. Instructions will also need to be issued to all industrial, municipal and residential units along the coast near the three mass nesting sites, to install ‘turtle friendly’ lighting. The light sources should be identified on moonless night and pinpointed and the owners/users should be directed to do the needful thereafter.

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3.8. Removal of Casuarina Plantations

3.8.1 The Bombay Natural History Society may be requested to undertake a study urgently to identify casuarina plantations that interfere with the turtle nesting along the Orissa coast. Such casuarina plantations together with their root stock must be removed and the beach restored to its natural condition. The experts should lay down norms for future shore plantations to be used as protection from cyclones and tidal upsurges. The BNHS may be asked to submit its report early so that effective follow up action can be taken before the next season.

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Appendix II

Fishing regulations

Based on CEC recommendation, there has been color coding for fishing vessels based on the port of registration⁵³. The vessels owners have been instructed to follow the color code to their vessels according to their district as follows:

District	Color code wheel house	Top
Ganjam	Yellow	Yellow
Balasore & Bhadrak	Violet	Violet
Jagatsinghpur & Kendarapara	Red	Red
Puri	Orange	Orange

The rules under the OMFRA act, also stipulates a

registration and licence fees for fishing vessels, based on the type of vessel. Mechanized fishing vessels up to 15 m or up to 25 gross tonnage (GT), pay an amount of Rs 500 annually as licence fees, while country crafts above 8.5 m pay an amount of Rs 75, and up to 8.5 m, including canoes, pay Rs 30 per year by 30 June every year. Any delay in payment, leads to a fine, at the rate of Rs 5 for the first month beginning from 1st July upto 31st July, and then Rs 1 per day for the succeeding months, and not later than 90 days from the date of expiry of the licence.

The rules also restricts the number of mechanized fishing vessels up to 15 m or 25 GT operating beyond 5 km, to 100 vessels in Dhamara (Balasore District from Bideipur till Hansua river mouth in Cuttack District), 300 in Paradeep (Cuttack District from Hansua river mouth south wards till Harishpurgarh), 100 in Astaranga (Cuttack District from Harishpurgarh till 2 km north of Chilika lake mouth in Puri District), and 120 in Rushikulya (Chilika river mouth and Ganjam District).

⁵³ letter no. 2342 dated 8th February 2007, from the Directorate of Fisheries, Cuttack, Orissa

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Appendix III

Number of vessels seized

Year	No. of vessels seized
1997-98	176
1998-99	50
1999-00	17
2000-01	38
2001-02	135
2002-03	65
2003-04	35
2004-05	79
2005-06	32
2006-07	41

Source: Forest Department, Gahirmatha Management Plan 2008-2009 to 2017-2018(Draft)

Nesting season	Trawlers	Gillnetters	Other Mechanized boats	Total	Persons arrested	PR Cases
2003-2004	09		28	37	63	23
2004-2005	22	36	34	92	180	75
2005-2006	07	09	15	31	71	15

Source: Forest Department reports

List of fishing vessels seized, as per the records of the Coast Guard

Year	No. of vessels seized
1997-98	65
2001-02	22
2002-03	
2003-04	20
2004-05	8
2005-06	7
2006-07	27
2007-08	5

Discussions with fishing communities

In the last five years, five gillnetters belonging to Kharinasi fishing village have been seized by the forest department for violating sanctuary regulations and entering the core area⁵⁴. Cases have been filed against the crew and vessel owner. The crew is often released only after a month, on paying a bail amount of Rs 2,000-3,000 per person. The boats are released after a few months, after paying at least Rs20,000 to Rs25,000 per vessel, as fines. Owners of fishing vessels spend almost Rs50,000 to Rs60,000 as legal expenses towards lawyer fees, besides the amount paid for bail/ release of crew and the vessel, and the expenses incurred for travel to different court hearings, either at Pattamundi court or Kendrapara court. Boat owners also complain that vessels in custody are not properly maintained and are often damaged. Sometimes the engines and other parts from the vessel are stolen. They also point out that when the vessels are confiscated, valuable fish catch is also seized from the vessels. Taken together, the arrest and seizure process represents a major financial setback for vessel owners.

⁵⁴ The fishing vessels belong to Narayan Vishal, Pradeep Behera, Shanti Singh, Sankar Das and Nimoy Mandal.

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Appendix IV

Table : Turtle population, mortality rate and violations in Gahirmatha since the time of sanctuary declaration

Year	No. of nesting sea turtles counted	No. of dead turtles	No. of vessels seized	Percentage of dead turtles to nesting population
1996-97	No mass nesting	3634		
1997-98	No mass nesting	5233	176	
1998-99	298000	6075	50	2.04
1999-2000	711000	11720	17	1.65
2000-01	741000	4031	38	0.54
2001-02	2841	5098	135	179.44
2002-03	75032	4947	65	6.59
2003-04	238091	2430	35	1.02
2004-05	236605	1400	79	0.59
2005-06	274793	1571	32	0.57
2006-07	147811	2036	41	1.38

Source: Gahirmatha Management Plan 2008-2018 (Draft)

No. of nesting turtles in Gahirmatha

Year	No. of nesting sea turtles counted
1984-85	291000
1985-86	50000
1986-87	636000
1987-88	No mass nesting
1988-89	315000
1989-90	207000
1990-91	659000
1991-92	384000
1992-93	672000
1993-94	695000
1994-95	339500
1995-96	290000
1996-97	No mass nesting
1997-98	No mass nesting
1998-99	298000
1999-2000	711000
2000-01	741000
2001-02	2841
2002-03	75032
2003-04	238091
2004-05	236605
2005-0 ⁵⁵ 6	274793
2006-07	147811

While mass nesting was very high in 2001-2002, maximum turtle mortality was reported in 1999-2000 by the forest department (11720). In 1993-94, the turtle mortality was over 4500 dead turtles.

⁵⁵ Only in , Nanjura, Panikhia, Garjana, Bhopal, Tantiapal, Singhpur, Baro, Baulakani, Ratapanga, Narsinghpur, Banapada, Kandarapatia, Jamboo, Suniti, Panchagochhia, Kantilo, Kansarabadandua, Bagagahana, Vateni, Kaunsiapal, Hariabanka, Kharnasi, Ramnagar, Petchhela, Badatubi, Bahakuda, Batighar, Sanatubi, Barakoikhola, Kajalpatia, Uttat khola and Dakhina Khola.

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Number of dead turtles counted in Gahirmatha

Year	No. of dead turtles
1990-91	1210
1991-92	1119
1992-93	1356
1993-94	4846
1994-95	4377
1995-96	1244
1996-97	3634
1997-98	5233
1998-99	6075
1999-2000	11720
2000-2001	4031
2001-02	5098
2002-03	4947
2003-04	2430
2004-05	1400
2005-06	1571
2006-07	2036

APPENDIX V

Fisherfolk population of Orissa, 2005

	2005
Total fisherfolk population	4,50,391
Active fisherfolk	1,21,282
Full time	74,980
Part time	34,315
Occasional	11,987
Fisherfolk involved in allied activities	152,534
Men	102,183
Women	50,351

Source: CMFRI 2006

APPENDIX VI:

Marine capture fish production of Orissa

Year	CMFRI	State
2003-04	68,857	1,16,880
2004-05	79,194	1,21,929
2005-06	1,01,500	1,22,214
2006-07	89,586	1,28,141
2007-08		1,30,767

Source: CMFRI 2006, Department of Fisheries 2008