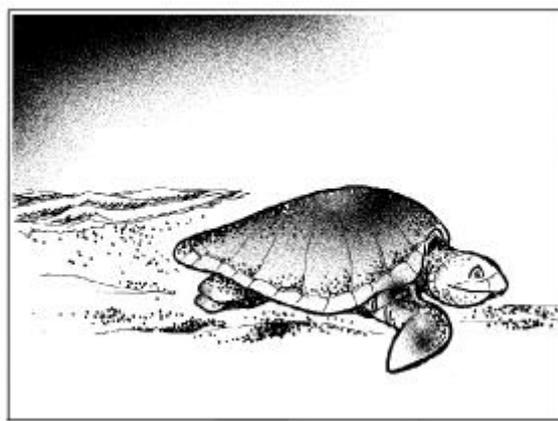


SAMUDRA Monograph

Sea Turtle Conservation and Fisheries in Orissa, India



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Acknowledgements

The growing conservation–livelihoods conflict and impasse throughout the world, whether in terrestrial or marine ecosystems, is well illustrated in the Indian coastal State of Orissa. There is mounting conflict involving fisherfolk, government departments and conservationists over the implementation of the official sea turtle protection measures on the Orissa coast. This atmosphere of conflict virtually typifies India’s experience with marine and coastal conservation in other parts of its coast. The seriousness and volatility of the local context witnessed in Orissa encouraged this study of the situation there. In solidarity with the struggles of women in fisheries, this study also underscores the implications of the present approach of marine conservation for women fishworkers’ labour and lives.

The fieldwork for this study was undertaken in the middle of the January–February turtle season in 2004. A controversial and live subject invariably poses difficulty of access to information and opinions. This was especially pronounced during the charged-up turtle season. However, many barriers to information were surmounted and logistical uncertainties easily sorted out, thanks to the support, interest and generosity of several individuals and organizations. I am indebted to several people who made my work in Orissa an experience to cherish. To name them in alphabetical order:

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A. The India Case Study: Conservation and Fisheries in Orissa

1. Introduction

In 2003 the Asia Pacific Research Network (APRN), the Asia Pacific Forum on Women, Law and Development (APWLD) and the International Collective in Support of Fishworkers (ICSF) commissioned a series of case studies to understand the impacts of globalization processes on the labour of women fishworkers. The India Case Study focuses on the consequences of global efforts in natural resource conservation.

In a world unified (and bound) by trade, national actions (or the lack thereof) are of global significance. Increasingly, we find national environmental problems, regulations and conservation measures featuring in global trade discussions. The last few decades of the previous millennium saw several countries engaged in global dialogue, highlighting concerns about climate change, environmental degradation, the depletion and destruction of natural resources, and the loss of biodiversity due to human exploitation. These concerns traverse national and international jurisdictions.

However, compelled as nations are by their common pursuit of profitable trade, almost all additional pursuits, including environmental conservation, are primarily perceived in terms of their impacts on trade. One of the concerns for developing countries like India has been the use of multilateral environmental regulations as trade barriers against their exports.

This India Case Study provides details of the experience in Orissa. More than a decade of conservation effort has gone into protecting the Olive Ridley (*Lepidochelys olivacea*) sea turtles that seasonally visit the Orissa coastal waters. This study details the existing sea turtle conservation measures and the implications of conservation approaches for the livelihoods of fisherfolk. Special focus has been placed on the implications for the traditional fishing communities and women from these communities. By documenting the legal, procedural and institutional aspects of marine conservation efforts in Orissa, the study unfolds the escalating conflicts arising out of the interaction between fisheries and turtle conservation.

The study concludes with an assortment of views and strategies directed towards fulfilling the goal of turtle conservation, while sustaining the fishworkers' livelihood endeavours.

The terms of reference of the India Case Study were as follows:

1. To provide background information about the Rushikulya, Devi and Gahirmatha areas (turtle nesting sites in Orissa), their legal status and the conservation measures in place.
2. To bring to light the socioeconomic conditions of fishing communities belonging to the small-scale sector and inhabiting a selected study area in close proximity to the Gahirmatha, Rushikulya and Devi areas. Particular emphasis was to be placed on the conditions of women in the study area.
3. To highlight the economic and social impacts of conservation initiatives on the livelihoods and traditional rights of small-scale fishing communities within these areas, and the livelihood strategies being adopted by these communities.
4. To propose possible conservation measures that take into account the livelihood interests of small-scale fishing communities.

2. Global Actions and Indian Sea Turtle Conservation Measures

Fishing technologies and turtle protection compulsions

Western development ideologies and strategies have succeeded in completely transforming the Indian fisheries sector. In Orissa, this is manifested in the growth of the mechanized sector and the gradual decline of the artisanal sector. From the 1970s, there has been a distinct shift away from the artisanal sector, towards modern and mechanized fishing methods. These fishing techniques include bottom-trawling and other mechanized means of fishing that are known to degrade the marine environment as well as contribute to the depletion of fish stocks.

It is important to recognize that the current official sea turtle conservation measures in Orissa have emerged as a result of international trade requirements, apart from sustained demands from local environmental

organizations. Along with the inclusion of sea turtles in Schedule I of The Indian Wildlife (Protection) Act, 1972, the country is obliged, under various international conventions, to take measures to conserve sea turtles. India is a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973, which lists all species of marine turtles in Schedule I, prohibiting their international trade. India is also a signatory to the Bonn Convention on the Conservation of Migratory Species of Wild Animals (CMS), 1979. This requires India to put in place strict conservation measures for the five species of marine turtles that visit the Indian coast, as listed in Appendix 1. The irony is that the very countries that influenced developing countries to overexploit the seas now actively utilize multilateral environmental agreements to compel developing countries to 'protect' marine resources.

Conservation motivations

What truly boosted official turtle conservation measures in India is what has come to be known as the 'WTO shrimp-turtle case'. In 1996 the United States (US) banned shrimp imports from India. Section 609 of US Public Law 101-102, enacted in 1989, dealt with imports. It said, among other things, that shrimp harvested with technology that may adversely affect certain sea turtles may not be imported into the US, unless the harvesting nation was certified to have a regulatory or conservation programme comparable to that of the US. India's fears regarding environmental trade barriers came true in 1996 when a US Court of International Trade (CIT) ruled that US import restrictions should apply to all countries where shrimp harvesting affects sea turtles. Since the US Endangered Species Act of 1973 required US shrimp trawlers to use turtle excluder devices (TEDs), shrimp-exporting countries like India were essentially compelled to mandate that TEDs be fitted on to their shrimp trawlers as well.

Taking off from these externally prompted turtle conservation measures, Orissa has introduced closed areas, seasonal fishing closures and rules mandating fishing gear modifications such as the TEDs on trawl nets. After the Gahirmatha turtle nesting site was brought to public attention by H.R. Bustard in 1974, and the attention the turtles received through subsequent research efforts and pressure from international and national agencies for the conservation of the species, the turtles' habitat at Gahirmatha and the other two sites also came to receive legal protection.

Interpreting global conservation as identical regional conservation actions

It is interesting to witness how global trade processes can influence the direction of a local concern, such as the conservation of marine resources. If we include the influences of Western conservation ideology, we see more pronounced impacts. Several US-based environmental organizations played an important role in securing the shrimp import ban on countries like India. The ban has also been advocated by environmental organizations within India itself. With this, a general in-house problem pertaining to the approach towards conservation comes to light.

Currently, the official conservation measures meet (on paper) the requirements of global environmental and trade lobbies seeking homogenized environmental regulations. However, there is much dissatisfaction over this approach, with dissenters believing it to be equivalent to the 'dumping' of conservation ideas on the country. Northern international environmental organizations have been frequently accused of harbouring myopic visions of conservation. Three charges have often been levelled against them:

- an obsession with charismatic species (dubbed as flagships of conservation) to the extent of altogether abandoning an ecosystem approach
- the belief that isolating humans from wildlife habitats is an adequate conservation strategy
- the compulsion to duplicate and implement identical conservation measures across the world

It is well understood that existing conservation practices in erstwhile British colonies such as India continue to reflect this colonial protection ethic. Thus, the above philosophy is reflected in Indian wildlife laws and also built into the conservation programmes of some local environmental non-governmental organizations (NGOs).

It is increasingly clear that the management strategies used in marine conservation today are unable to respond either to emerging scientific and ecological findings or to the changing needs of local fishing communities. The reason is that conservation measures are often inappropriate, exclusive and insensitive to the rights and basic requirements of the communities whose livelihoods are intricately linked to wildlife

habitats. Therefore, while local conservationists in Orissa and other parts of India constantly demand better implementation of existing turtle conservation measures, few question the rationale behind the approach. To make matters worse, new protection orders were introduced in 2003, aggravating matters for the traditional fishing communities.

3. Challenges for Marine Conservation

With declining fish stocks becoming an indisputable reality all along the Indian coast, urgent and effective fisheries management can no longer be ignored as the primary solution. The challenges for marine conservation in India, with its global biodiversity value and coincident poverty, are manifold.

The importance of appropriate conservation

Traditional fishworkers throughout the developing world recognize the negative ramifications of having adopted Western technologies—modernized/mechanized craft and gear—in their fisheries. At the receiving end of the development of the industrialized and export-driven fisheries are women. Women in fisheries have constituted a large, and, for the most part, invisible, workforce. This aspect of their work has made them vulnerable to changes in fisheries and changes affecting fisheries (including conservation measures). The picture is simple: Although reputed to have raked in enormous profits when introduced, certain modern fishing methods (such as bottom-trawling) are detrimental to marine life and fisheries in the long run. Conversely, artisanal fisheries, by virtue of scale and the social organization of artisanal fishing communities, are recognized worldwide as the hope for sustainable fisheries and marine conservation. The primary challenge for fisheries management and marine conservation is, therefore, to develop and implement *adequate* and *appropriate* conservation strategies. In doing so, marine conservation measures need to also be measured by indicators of human development such as the welfare of artisanal and marginalized fisherfolk, better quality of life of women in fisheries, and so on.

The role of fisherfolk

Recognizing fisherfolk as partners in conservation is critical to the above exercise. This requires appreciation of, and support to, the long-standing

struggles of traditional fisherfolk regarding *their* environmental concerns, particularly those that deal with larger resource management and access issues. These include implementation of fisheries management measures (such as the ban against bottom-trawling), the struggles of artisanal fisherfolk regarding access to natural resources, the struggles against hazardous industries, and coastal pollution.

Global engagement

The experience with the shrimp-turtle case demonstrates the difficulties of global engagement on both trade and conservation issues, particularly in the absence of national or local conservation plans for both commercial fisheries and marine wildlife. Therefore, the second and perhaps more lasting challenge will be that of ensuring the country's commitment and ability to defend its own conservation initiatives and decisions before a powerful lobby of global trading partners.

4. The Coastal State of Orissa

Orissa has six coastal districts, divided further into administrative blocks (see Figure 1). This study draws information from the 16 coastal blocks where the presence of turtles has been recorded.

There is evidence in Orissa's history--extending to the previous millennium--of early knowledge of sailing, for both trade¹ and fishing. The coastal boundaries of the earlier State extended into modern Andhra Pradesh to the south and West Bengal to the northeast, which explains the Andhra and Bengali influences and characteristics that are plainly visible in Orissa's coastal culture today.

Modern Orissa is located between the 17^o 48' and 22^o 34' north latitude and 81^o 24' and 87^o 29' east longitude. The coastline is 480 km long and the Bay of Bengal forms the eastern coastal boundary of this territory. Being in a tropical zone, the summer months of April and May are incredibly hot, with temperatures often hovering around 50^oC, but the coastal tracts are granted some relief by the moderating influence of the sea. The State is drained by several rivers, the six important ones being the Subarnarekha, the Budhabalanga, the Baitarani, the Brahmani, the Mahanadi and the Rushikulya. Paradip can be taken to be the dividing

point between the northern and southern parts of the coast of the State. The continental shelf of Orissa measures about 24,000 sq km and extends to 120 km off the northern coast, where the Mahanadi, Baitarani and Brahmani rivers bring heavy sediments. Off the southern coast, it is about 40 km wide. The northern coast consists of a complex of deltas, estuaries, marshes, mangrove forests and an extensive tidal area, whereas the southern coast has sandy beaches, open shores and a deeper continental shelf.

The differences in coastal ecological and oceanographic conditions between the north and the south are responsible for the occurrence of different fisheries, different fishing techniques, knowledge, and craft and gear, and also cultural and social practices in the two regions. The various studies conducted by the Bay of Bengal Programme (BOBP)² in Orissa in the 1970s and 1980s attest to this (Tietze, 1985). These conditions also determine the presence of specific flora and fauna in the region.

Fig 1: The Coastal Districts of Orissa and the Relevant Administrative Blocks



The history of marine fisheries in Orissa and knowledge about the fishing communities of the State is still somewhat obscure. However, Orissa is well known for the ecological treasures it nurtures. Besides harbouring the famous salt-water crocodiles (*Crocodylus porosus*) in the mangrove forests of Bhitarkanika (Kendrapara district), Orissa's coastal waters and beaches are the breeding and nesting grounds of the famous Olive Ridley sea turtles.

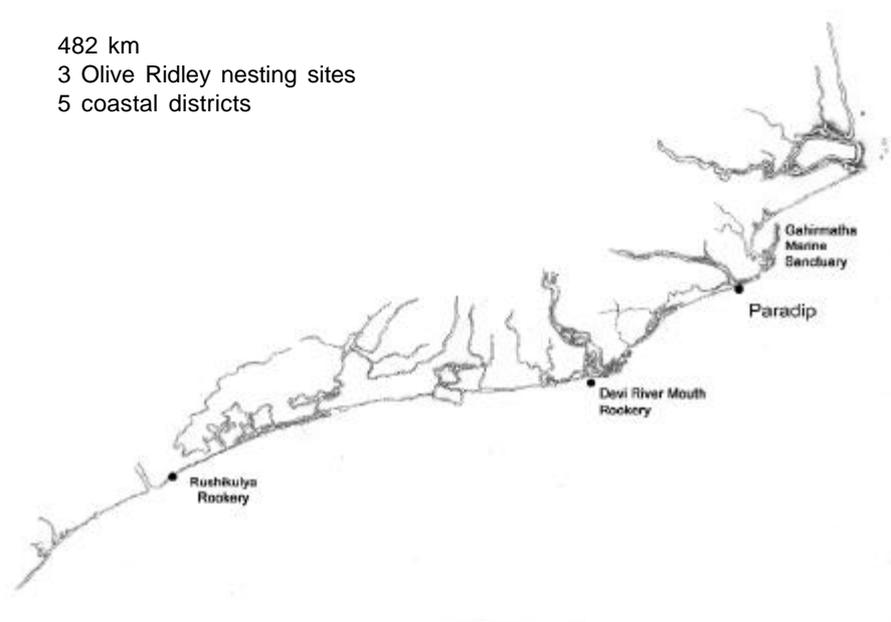
5. Turtle Nesting and Breeding Grounds in Orissa

There are a total of seven sea turtles in the world, though there is some debate regarding the taxonomy of the black turtle, which some consider as the eighth (Bowen and Karl, 2000). Of these, five are known to occur in Indian coastal waters: the Olive Ridley (*Lepidochelys olivacea*), the hawksbill (*Eretmochelys imbricata*), the green sea turtle (*Chelonia mydas*), the loggerhead (*Caretta caretta*) and the leatherback (*Dermochelys coriacea*) (GOI, 2000). All are known to nest on the Indian coast, with the exception of the loggerhead. Olive Ridleys are widely distributed across the world, and are also the most abundant of sea turtles. They are best known for their synchronous mass-nesting behaviour, recorded on the Pacific coasts of Mexico (at La Escobilla) and Costa Rica (at Ostional and Nancite) and in India (at Orissa).

The physical spaces of existing (and potential) interactions between turtles and fisheries can be understood by observing the Olive Ridleys' behaviour on the Orissa coast.

Nesting beaches

While Olive Ridleys nest both on the east and west coasts of India, mass nesting has been observed at three sites in Orissa. The three main rookeries or turtle nesting beaches along the 480 km stretch of the Orissa coast are the Gahirmatha rookery (Bustard, 1976), between the Brahmini and Baitarani, located north of Paradip; the rookery at the Devi river mouth, about 100 km south of Gahirmatha (Kar, 1982); and the rookery located 320 km south of Gahirmatha, near the mouth of the Rushikulya river (Pandav et al, 1994b) (see Figure 2). The turtle season in Orissa begins in October and ends in April, when the hatchlings leave the nesting beaches.

Fig 2: The Orissa Coastline

The female Ridelys come ashore to nest, usually at night. Nesting starts from January and occurs sporadically all along the Orissa coast. The female turtles climb ashore several times during the nesting period. Except for the **Gahirmatha rookery**, the nesting beaches are located close to fishing villages.³ Prior to the 1989 cyclone, the Gahirmatha rookery was a 10–km stretch of uninhabited beach. The beach formed the eastern boundary of the Bhitarkanika National Park (within which human habitation is prohibited by law). The present rookery is only about 4–5 km long and fragmented into two sand spits, measuring roughly 2 km in length and 100 m in width (Nasi 1 and 2). Nesting also takes place on the Wheeler islands, which is the site for the missile testing range of the Government of India's Defence Research and Development Organization (DRDO). Nesting has not been recorded anywhere on the Balasore coast, presumably due to the substrate condition of the coast, which is shallow with a vast inter-tidal area (Pandav et al, 1994).

The **Devi rookery** earlier comprised a 4-km long island called Akashdia and a 3-km long sand-spit called Sahana Nasi (Pandav et al, 1994a), besides the mainland beach. Akashdia was destroyed in the cyclone of 1999. Pandav et al state that 40 to 45 temporary settlements of fisherfolk of Sahana, Nuagada, Balisahi and Gurujanga villages were present on the sand-spit in December 1993 and January 1994, but the fisherfolk left the island in February 1994, when the sea became rough. These fisherfolk had observed turtle nesting and reported it to the researchers. A fishing harbour for trawlers was set up at Nuagada, around 1 km from the nesting site. The harbour was partially destroyed by the super-cyclone that hit Orissa in 1999. At present, only a bamboo jetty exists further upstream along the Devi River. The present Devi rookery consists only of the Sahana Nasi.

The **Rushikulya rookery** is spread over 6 km and has two permanent fisherfolk settlements: Gokharkuda and Kantiagada villages. The fisherfolk keep their boats (mostly beach-landing craft and modified *kattamarams*) and nets in certain parts of the shore. During the fishing seasons, there is regular fishing activity on the beaches, including unloading, auctioning and sorting of fish. The local fisherfolk and volunteers of the Rushikulya Sea Turtle Protection Committee (RSTPC)⁴ say that these manifestations of human presence do not adversely affect turtle nesting .

The Olive Rидleys climb above the high-water mark, dig flask-shaped nests and lay about 100–150 eggs in each clutch. In their study, Pandav et al (1994a) report that the local fishermen collected turtle eggs (from an estimated 200 nests) for their own consumption but not for commercial purposes. Discussions with local fisherfolk and volunteers of the RSTPC reveal that this practice is no longer observable. Basudev Tripathy of the Sea Turtle Project, Puruna Bandha, confirms this observation.⁵

Turtles prefer to nest in areas that are not brightly lit, and have favourable beach and soil conditions. At present, fishing villages are closest to the nesting beaches at Rushikulya. The volunteers of RSTPC have worked to spread awareness in these villages about the impacts of illumination on turtle nesting. They state that the problem of illumination from residential areas is better tackled than that from industrial and other large establishments such as the DRDO's missile testing range at the northern tip of the Gahirmatha Marine Sanctuary and the bright lights of the Paradip

Port, which are observable even at the congregation waters near the Gahirmatha rookery.

Coastal waters

The Olive Ridleys' breeding season is marked by the large-scale migration of male and female turtles to breeding grounds from their feeding grounds—a distance sometimes exceeding 1,000 km. The Ridleys travel in aggregations and start arriving in the coastal waters of Orissa by October. Ridleys, in particular, are known to aggregate in enormous numbers off nesting beaches. They form mating pairs, mostly concentrated in the inshore waters. These congregations, consisting of reproductively active adults, are termed 'reproductive patches' (Ram, 2000). In Orissa, the turtles congregate in shallow coastal waters (less than 50 fathoms deep) close to the nesting beaches. Turtle congregations have been observed in the Gahirmatha coastal waters (between the Dhamra and Mahanadi river mouths), in the Devi coastal waters (between Jatadhar *muhana*⁶ and Kadua *muhana*) and in the Rushikulya coastal waters (the Chilka mouth or the Magarmukh to Rushikulya river mouth) (Chadha and Kar, 1999). There have been neither studies nor any systematic monitoring of the offshore turtle congregations in other areas.

The practice of turtle fishing has sharply declined since the promulgation and strict enforcement of The Indian Wildlife (Protection) Act, 1972 (Chadha and Kar, 1999). Open capture of nesting turtles from nesting sites or turtling from the coastal waters is virtually non-existent today. The turtles are now most vulnerable during the time they spend in the coastal waters, due to the high probability of contact with fishing nets and potential incidental capture.

6. Turtle Mortality from Incidental Catch in Fishing Operations

The turtle season coincides with the fishing season in Orissa. Winter is the season for important commercial species like prawns, Indian shad, silver and black pomfret, ribbon fish, seer fish, sole, etc., most of which feed the export market as well as distant domestic markets such as Kolkata, Chennai and Kochi. The presence of favourable coastal surface currents and consequent good fishery in the turtle season has been recorded in the 1980s (Kar, 1980). Turtle mortality due to incidental capture in fishing

nets has been reported from the 1970s. It is well known that turtle mortality off the Orissa coast has been high, with figures averaging 10–15,000 every year since 1999. Kar identifies small shrimp trawler operations in the continental shelf as resulting in the incidental catch and subsequent mortality of turtles (Kar, 1980). Most published papers and reports state that gill-nets and trawl nets are responsible for the death of turtles by drowning (James et al, 1989; Pandav et al, 1997; Pandav et al, 1998; Pandav et al, 1999; Chadha and Kar, 1999; Shankar, 1999; GOI, 2000). In an application before the Supreme Court-constituted Central Empowered Committee (CEC), the petitioner states, in Para 12, that three instances were recorded in January and February 2002, when 38, 205 and 95 turtles were found dead in floating gill-nets, cut loose by the crew of mechanized gill-netters. It has also been reported that gear used by traditional non-mechanized craft cause entanglement (James et al, 1989). Even monofilament nets are implicated, especially when applied in greater concentrations in a particular area (Chadha and Kar, 1999). However, no special studies have been undertaken so far to determine the specifications (mesh composition, mesh size, net length, depth, area of application, etc.) of the gill-nets that are actually responsible for turtle mortality. It is generally understood that turtle mortality takes place primarily due to entanglement or capture in certain fishing nets, which prevents turtles from surfacing to breathe air, causing death by drowning.

There are no estimates of the number of turtle deaths caused by propeller hits, though such numbers are probably not significantly responsible for turtle mortality in Orissa. Local turtle protection groups at Devi and Rushikulya state that few turtles have the characteristic 'hit' injuries, compared to those that are drowned. The fishing vessel per se does not cause mortality, other than by the occasional propeller hit. However, the nature of the craft determines the length, depth and weight of the fishing gear it can operate and the distance at which the nets are set in the water.

At present, there is great disagreement between the various categories of fisherfolk (mechanized trawlers, mechanized gill-netters, motorized boats and non-motorized craft), conservationists, the Forest Department and the Fisheries Department. The first difference is over deciding which fishing operations and gear are responsible for entanglement and drowning of turtles. The second point of difference relates to the turtle protection strategies currently in place and, more importantly, the process of selecting and enforcing conservation practices.

The discussion on responses of Orissa's fishermen and women towards conservation and the implications of conservation measures on fisherfolk, particularly on women, requires an understanding of Orissa's traditional fisheries.

B. Orissa's Traditional Marine Fishworkers: Locating Women's Labour

The history of marine fishing as carried out in many parts of Orissa today is only about 60 years old. The type of marine fishing practised had earlier been the mainstay of the Telugu-speaking communities called 'Noliyas' in the southern coastal districts of Puri and Ganjam. The Oriya fishers, particularly in the northern districts of Balasore, Kendrapara and Jagatsingpur (the former Cuttack district), preferred the abundant and relatively safer option of inland fishing in the maze of Orissa's rivers. Some of these Oriya fishers also carried out shore-seine operations in the shallow coastal waters of the northern continental shelf. The fishing communities, both inland and marine, developed remarkable fishing knowledge, techniques, and craft and gear. The marine fisherfolk, in particular, possessed a distinctive understanding and communion with the sea. Only men went fishing, while women, particularly from Telugu communities, were actively engaged in post-harvest fisheries and ancillary activities.

1. Socioeconomic Profile of Marine Fisherfolk

The turtle-fisheries interaction is not confined only to fisherfolk residing close to the nesting sites. The coastal waters where turtles are known to congregate are also fishing grounds for fisherfolk whose villages are located several miles away from these areas. This section of the study provides an overview of the conditions of fisherfolk who reside in close proximity to nesting sites, and also covers fishing villages from where fisherfolk travel to the three fishing grounds.

The artisanal communities

Kendrapara and Jagatsingpur are two districts that have large Bengali-speaking fishing communities. Over 90 per cent of the population in Kendrapara is Bengali-speaking. After India attained independence in 1947 and during the Partition period, the Indian government settled Hindu refugees from east Pakistan (present-day Bangladesh) and Bengal on the northern Orissa coast. They were settled in two phases—in 1948 and again in 1970 (after the Bangladesh war)—mostly in the Mahakalpada block. They are almost completely Hindu communities.

A fair sense of Orissa's marine fishing history is gleaned from a series of studies carried out by the Bay of Bengal Programme (BOBP) in the early 1980s (Tietze, 1985). The studies confirm that the artisanal marine sector was largely comprised of non-Oriya-speaking communities. The predictable political fallout of the artisanal sector being traditionally dominated by a non-Oriya-speaking population is that these communities were almost deliberately neglected in all development efforts. Although subsequent years saw the fishing sector attract other communities, most of the traditional Telugu communities and migrants from Bangladesh and Bengal remain trapped at the bottom end of local income groups, often in poverty.

Fishing craft and gear of marine fisherfolk: A culture in transformation

Fishing craft, grounds, gear, techniques and even fisherfolk have undergone a near complete transformation across the Indian coast, and Orissa has not been immune to this change. The fisherfolk developed an array of nets, including boat-seines, entanglement nets and gill-nets of varying mesh size, composition and thickness. Other than trawl nets, most marine fishing today takes place with gill-nets. Other fishing methods include the use of the hook-and-line method (only south of Paradip), a small number of manual ring-seines (a new practice restricted again to the south of Paradip), and the use of shore-seines.

Earlier most gill-nets were made from natural fibres such as cotton and hemp, but this has given way today to the use of nylon, and, more recently, plastic, as netting material. The plastics are either monofilament plastic (polyamide mono) or high density polyethylene (HDPE), used to make a large-meshed net with 3-4 filaments of plastic, to catch seer fish, shark and other pelagic fish. This is locally known as the *koni jaal*. Nylon is still used to make trammel nets (for prawns) and sardine nets, which are smaller-meshed nets. Large-meshed nylon nets (called *bhetki* and *sankutch jaal*) target rays, sea bass and large fish. The Orissa Traditional Fish Workers Union (OTFWU) states that this gill-net does cause the entanglement and mortality of turtles. The lengths of different gill-nets vary with the targeted species, the area of fishing, the craft and, importantly, the income of the fisher.

In the 1970s and 1980s the BOBP, then a regional marine small-scale fisheries programme of the Food and Agriculture Organization of the

United Nations (FAO), was active on the Orissa coast. It assisted in the motorization (largely outboard engines) of artisanal fishing craft and also in the introduction of new beach-landing craft such as the IND20. This also prompted the motorization of indigenous craft such as the *teppas* and *navas*. Several private entrepreneurs in Andhra Pradesh today supply the fisherfolk with motorized craft made with fibre-reinforced plastic (FRP), locally called “fibre *teppas*” (*kattamarams*) and “fibre *dongas*” (small boats). The promotion of new technologies and motorization was intended to raise catches and incomes by maximizing the fishing effort in terms of distance and time. The Fisheries Department still runs schemes for the motorization of fishing vessels.

The use of inboard engines with designs borrowed from West Bengal also grew, particularly in the areas north of Paradip. The size of these vessels correlates with the engine capacity, which ranges from single-cylinder (10 hp) boats to those with six cylinders. Rarely do vessels have an engine capacity beyond this. This influences the distance and the duration of the fishing effort, with larger boats staying out for five to six days. Fibre *dongas* and gill-netters use either wood or FRP.

The kind of nets used in these boats varies. Larger boats are capable of carrying longer gill-nets, sometimes measuring 2-3 km. Fishers state that, when laid in turtle congregation areas, these long nets cause considerable entanglement, especially if made from multifilament or HDPE material. While planning measures to reduce turtle mortality, it should be recognized that it is not the craft per se that causes mortality (the number of deaths due to propeller hits being insignificant) but the gear that it uses.

2. Where Women Work: Glimpses into the Villages around the Rookeries

Gahirmatha	Devi	Rushikulya
<ul style="list-style-type: none"> • The Gahirmatha Marine Sanctuary extends along the Rajnagar and Mahakalpara blocks of Kendrapara district but has fisherfolk coming in from Jagatsingpur District. • Land holdings are usually about 2–3 acres per family. All families do not agricultural land. • Cyclone relief shelters constructed after the 1999 super-cyclone serve as the only community halls and schools in most areas. • Several fisherfolk in the interior areas have land titles, while migrants do not. • At Sandhakhuda near the Paradip Port, civic amenities for the Noliya-dominated fishing villages are poor. • Boats in this area include gill-netters, non-motorized and motorized crafts (both fibre and wooden), and a large number of trawlers. • There are no local groups that are involved in any sea turtle conservation programmes. 	<ul style="list-style-type: none"> • The fisherfolk who access the coastal waters off the Devi river mouth are situated in Jagatsingpur District and in Puri District. • Each landholding is about 1 acre in size. Those who do not practise fishing or agriculture are labourers. • After the floods in 2003, the Kadua River and Devi River flooded, seriously affecting several hundreds of acres of crops. • Fisherfolk and other farmers did not get any compensation for their losses, and many of their lands still lie inundated with water. • There are hardly any permanent roads to any of the coastal villages. Neither is there any form of public transport to most of these villages. • Due to efforts by researchers and conservationists, there are two groups of local youth involved in turtle surveys and protection work. 	<ul style="list-style-type: none"> • This area comprises of the administrative blocks of Ganjam, Chatrapur, Rangeilunda and Chikiti. • The fishing regulation zone at Rushikulya extends from the Chilika lake mouth at Magarmukh to the Rushikulya river mouth. • The fisherfolk who fish in these waters also include those from villages in the southern areas. • In some areas of Ganjam, villagers have been displaced and resettled for defence projects. This has created serious problems related to land rights. • The majority of the fishing population comprises Noliya fisherfolk and migrant Telugu fishermen. • There are no trawlers operating in these areas. The only boats here are wooden and fibre boats and wooden <i>kattamarams</i>. • The <i>bada jaal</i> and the <i>padava</i> inshore seine nets are still operated in these areas.

Women's labour in the Gahirmatha area	Women's labour in the Devi area	Women's labour in the Rushikulya area
<ul style="list-style-type: none"> • Except for Paradip, women are not visible workers in marine fisheries in areas around Gahirmatha. • They work in the agricultural fields as labourers, and tend to domestic animals. • Women help in the construction and maintenance of the houses. • The women of Sandhakhuda are also petty commission agents who participate in auctions at the Paradip harbour. • Women of the interior areas carry out tidal fishing using drag-nets and push-nets. • Women also sell fish at local markets in some areas. Some of them are door-to-door vendors. • Dry-fish operations are carried out in the Paradip area by a large number of women. • Fish drying is rarely carried on in the interior villages of Kendrapara and villages close to Gahirmatha and is carried on mostly for domestic consumption and for sale in neighbouring markets. • Women work as cleaners in the Paradip harbour. • Separate sets of women are engaged in fish sorting. 	<ul style="list-style-type: none"> • There are more NGOs working with the fisherfolk in Puri District. A few women's self-help groups exist along the Konark and Astarang coast in Puri District. • There are fisherfolk who are from the Oriya communities. The women say they do not engage in auctions, unlike the Noliyas. • Women sell both fresh and dry fish in these areas. • Almost all villages lack the necessary infrastructure for fish drying, such as racks. The roads are in poor condition, and there is hardly any reliable transportation. • The women from these areas also walk to the casuarina plantations to collect fuelwood. They also tend to cattle and grow groundnut and paddy in their fields. • The women collect prawns from the river for domestic consumption, despite the risk of being bitten by snakes and riverine animals. • There are no medical facilities nearby. 	<ul style="list-style-type: none"> • Women from the traditional sector are engaged in drying, packaging, transporting and marketing fish. • In many areas, Oriya women have learnt the art of taking part in auctions at the seashore. They are now comfortable with their newfound skills, and there are several formidable business-women on this coast. • Women, however, complain that company traders are taking over their businesses since they have greater access to capital and are able to bid higher. • Several women are part of a women's collective called <i>Samudram</i>. • The <i>Samudram sangha</i> or group has built up a reserve of Rs7 mn, largely from membership contributions. • Loans (ranging from Rs10,000 to Rs20,000) are given by <i>Samudram</i> for the personal needs of members, such as wedding expenses, children's needs, etc., which . Non-members usually fall prey to moneylenders.

Views from Samudram, the women's collective

Chittamma, the president of *Samudram*, a fisherwomen's group with 3,080 members, says that *Samudram* works with both men and women of the fishing community, since the livelihood needs of fisherfolk demand that the needs of the family are addressed. *Samudram* functions as a 'people's bank' and has also been involved in fisheries-related issues. "The fisherwomen are severely impacted by everything that happens at sea to their men," explains Chittamma. The Ganjam coast has seen many altercations between traditional boats and the trawlers from Andhra. The loss of income, coupled with the costs of replacing craft or nets damaged by trawlers, places tremendous stress on the family, especially the women. Women have the least amount of access to resources. Therefore, in moments of financial crises, they are denied even the meagre resources they have. For women, a decrease in incomes often means poor nutrition, poor health, insecurity and mental anguish.

Chittamma states that only recently have the women in her village been able to address issues such as the demand for dowry and the lack of infrastructure and healthcare facilities, which affect women the most. Women have always been invisible workers on the domestic front and in agriculture and fisheries. But the rising cost of living, falling fish catches and incomes, and social problems like alcoholism, poverty and indebtedness now force the women to work as labourers at road and building construction sites, as cleaners, as domestic workers in nearby cities, as agricultural labourers and so on.

C. Sea Turtle Conservation Measures in Orissa

The different fisheries- and wildlife-related measures that are related to sea turtle conservation in Orissa are listed below.

Date of Order / Notification	Conservation Action
<i>Species Protection</i>	
1972	The Wild Life Protection Act (WLPA) ¹ was introduced, listing all five sea turtle species visiting India in Schedule I. ² Hunting and trade of turtles was prohibited and made a punishable offence. Incidental capture of turtles was not distinguished from poaching.
<i>Habitat Protection</i>	
1994	Government of Orissa issued biennial orders under the Orissa Marine Fisheries Regulation Act (OMFRA), prohibiting all fishing in the waters close to the Gahirmatha beach off the Bhitarkanika National Park round the year. It is reissued at the end of each term.
6 June 1997	A seasonal prohibition on fishing by trawlers within a 20-km seaward radius ¹ of the Orissa coast from the Jatadhar river mouth to the Devi river mouth and from the Chilika river mouth to the Rushikulya river mouth starting on 1 January 1998 until 31 May 2000. This too has been regularly extended.
27 September 1997	The Government of Orissa issued a notification declaring the Gahirmatha Marine Sanctuary (GMS) under Section 26(1) (b) of the WLPA. The GMS core area measures 725.50 sq km and the buffer zone measures 709.50 sq km. Totally, the GMS measures 1,435 sq km.

10 October 2003	The State High Power Committee (HPC) recommends that the State Government consider proposals for the Devi and Rushikulya areas to be declared as wildlife sanctuaries.
<i>Fishing Rights</i>	
21 May 1998	The HPC permitted only catamarans and craft using motors of less than 10 hp and monofilament nets (of smaller net size and length) within the buffer zone of the GMS—an area located beyond 10 km from the shore. The core zone was to be kept inviolate.
<i>Gear Regulation</i>	
6 December 1997	Under Section 2(b) of the OMFRA, all fishermen using trawlers were to install TEDs in their trawl nets, failing which licences would be cancelled without option for renewal. TEDs were to be used throughout the year beyond 5 km from the seashore.
17 April 2001	The Orissa Fisheries Department issued an order amending the OMFR Rules, making it mandatory for all 'mechanized fishing vessels' to operate using a TED.
<i>Judicial Intervention</i>	
7 March 2003	Following a petition filed before the Central Empowered Committee (CEC) of the Supreme Court, ¹ the CEC issued interim direction No. (x) stating that "in view of the excessive fishing being done in the area for the next 3 months all gill-net boats operating within 5 km of the three nesting sites should be banned."
10 October 2003	Subsequent to these directions, the HPC ¹ decided that fishing by trawlers and gill-netters would be prohibited in the mouth areas of the Dhamra, Devi and Rushikulya rivers from 1 November to 21 May 2004. The directions did not specify the 'three months' in question (the directions were dated

	March 2004) nor did they specify the nature of the gill-net or the boat to which the ban applied.
CEC site visit report and orders 2004	<p>The CEC conducted a site visit in February 2004 to assess the extent of compliance of the Interim Directions. Among its many recommendations, it gave three significant orders:</p> <ul style="list-style-type: none"> • Within 5 km of the entire coastline, traditional non-motorized gill-net vessels should use only small-mesh, monofilament nets with a maximum length of 300 m. Such vessels would also be permitted within the congregation zones, with a ceiling on the number of such vessels (Sections 3.3.1 and 3.3.2 of the CEC report). • Motorized gill-nets would be permitted within 5 km of the coastline, except in the 5-km restricted area at Devi and Rushikulya. Such boats would have to use only small-mesh monofilament nets of a maximum length of 300 m. These vessels are not permitted to use multifilament large-mesh nets (Section 3.3.3 of the CEC report). • In addition to the sting ray net, the ring-seine net and the sea bass net, all nets measuring 140 mm and above, whether monofilament or multifilament, are to be prohibited in Orissa, until there is sufficient proof that they are not a threat to turtles (Section 3.3.5 of the CEC report).
<i>Fisheries Management Regulations</i>	
1982/1983	The OMFRA, 1982, and OMFR Rules, 1983, lay down a limit on the number of mechanized fishing vessels that can be licensed to operate along the Orissa coast. The present limit, as notified under Form VI, Rule 17 of the OMFRA Rules, 1983, is 1,000 vessels.

1983	<p>Rule 16 (1) of the OMFR Rules states:</p> <ul style="list-style-type: none"> • The area 5 km from the shore is reserved exclusively for non-mechanized traditional fishing craft. • Mechanized fishing vessels up to 15 m length shall be allowed to operate beyond 5 km off the coastline (this includes wooden trawlers and ‘Sona’ trawlers). • Mechanized fishing vessels of 25 gross tonnes and above or above 15 m of length shall be allowed to operate beyond 10 km from the shore only.
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‘Mechanized’, ‘Motorized’ and ‘Traditional’: The Baffling Official View

There are no proper definitions of craft, especially craft known as ‘gill-netters’. Indeed, to enforce the ban on gill-netters in the no-fishing zones, the HPC and the ground-level staff of both the Forest and Fisheries Departments used a layperson interpretation of a gill-netter to mean any boat using a gill-net. However, almost all craft (except trawlers) use gill-nets. The Central Institute of Fisheries Nautical and Engineering Training (CIFNET) of the Ministry of Agriculture, in its letter dated 6 January 2004, gave the following clarification:

Fishing vessels operating with outboard motors or transportable inboard engines in smaller vessels are known as motorized fishing (vessels).¹ The fishing vessels which are fitted with permanent inboard engine along with a gear box and propulsion system are known as mechanized vessels. The fishing operation done by such vessels using winches and other mechanized system for fishing operations may be stated as mechanized fishing. In view of the above, motorized boats are not included under mechanized fishing.

However, this definition does not give the specifications of a ‘smaller vessel’. By this definition, the gill-net boats, especially those operating north of Paradip, are **mechanized vessels** that conduct **non-mechanized fishing**. The OMFRA bans all mechanized vessels within the 5–km area. However, it is believed that some of these vessels are operating with licences stating that they are traditional (or motorized) boats. Incidentally, these vessels use multifilament nylon gill nets (*sankutch/bhetki jaal*) and also HDPE multifilament plastic nets (*koni jaal*).

D. The Impacts of Conservation on Fisherfolk's Livelihoods

1. Problems with the Current Labyrinth of Conservation Measures

Examining the official word on turtle protection measures in Orissa, one sees several problems with, and for, conservation. This is apparent when the word of law is juxtaposed with the situation of the fisherfolk. Central to the present impasse is the incompatibility of present forms of turtle conservation and the protection of fisherfolk's rights. There is lack of clarity on critical matters where the lives and livelihoods of fisherfolk involve turtle habitats. Most of these relate to the occupational rights of fisherfolk, such as the right of passage, identification and demarcation of closed areas, and so on.

That the trawling community opposed many of the conservation measures is well known. However, the negative fallouts of protection measures on the traditional sector have come to the fore only since 2003. The negative impacts on the fishing community precipitated into conflict only with the news of the fishing ban proposed by the High Power Committee in its meeting on 10 October 2003, following the interim directions of the CEC dated 7 March 2002, which prohibited the use of any gill-nets in the Devi and Rushikulya areas as well. Several fishworker's organizations and unions objected to this ban, which, for all practical purposes, prohibited fishing by any kind of gill-net in the three nesting sites. Leading the agitation was the Orissa Traditional Fishworker's Union (OTFWU), based in Ganjam District, which pressed for negotiations with the State government, and actively sought redressal for the traditional fishworkers.

It is clear that the fine print has been overlooked in the official preoccupation with demonstrating more 'serious' protection measures. Therefore, conservation measures in the State are characterized by a lack of consultation with fisherfolk either at the drafting stage or in their implementation. Outlined here are some of the problems identified by the fishing communities and certain concerns that are visible in the analysis of the relevant laws.

2. Problems with the Gahirmatha Marine Sanctuary

Several fishing villages are located on the southern coast of the Gahirmatha Marine Sanctuary (GMS). The fisherfolk of these areas operate fishing craft, comprising non-motorized boats, motorized boats and mechanized boats (with inboard engines and propulsion systems). However, all of these use non-mechanized fishing operations whereby nets are laid and pulled manually. The debate about mechanized and motorized vessels complicates the understanding of what forms of fishing are allowed in the buffer zone. The rationale for the present fishing regulations within the buffer zone is also not evident.

The core area of the GMS is situated near the coastline, extending 10 km on the seaward side, whereas the buffer zone lies in the waters between the 10–20 km area. To reach the buffer zone, one has to traverse the core zone. This creates confusion about the legality or illegality of the presence of a fishing vessel within the Gahirmatha's core zone. The CEC, in its final report, reiterates that the Forest Department should permit traditional fisherfolk passage through the core area to the buffer zone and should issue passes to them for such passage. However, this still does not deal with either the above issues of the rationality of the core and buffer areas or the operational aspects of innocent passage.

Until November 2003, when they were able to procure copies of the documents, most fisherfolk and local fisher leaders were unaware of these orders for the GMS as well as those permitting restricted fishing in the buffer zone. Almost all orders were drafted in exclusivity (there is no proof of any consultation with fisherfolk to draft the fishing rights within the GMS).¹ The finer details such as proof of 'innocent passage', assessment of number of marine fisherfolk requiring access rights, process of obtaining permits to pass through the core area of the GMS to the buffer zone, etc., were simply not worked out. These seem to have been the only 'adequate measures taken for local fisherfolk' mandated by the Wild Life Protection Act.

Researchers who have been studying the offshore turtle congregations indicate that, in order to bring down mortality rates, it is important to focus efforts on protecting the reproductive patches². Within the wide area of the GMS, comprising all of 1,435 sq km (including 27 sq km land mass), the congregation zone is confined only to the northern part near

Ekakula Nasi and Babubali islands. Therefore, the fisherfolk also state that there is really no logic for the declaration of the southern region as a core zone or for the present limits of the buffer zone.

It has also been noted that the congregations are known to move beyond the limits of the marine sanctuary in the northeastern direction (Ram, 2000). However, no protection activities take place outside this area. Therefore, the large GMS not only cuts off access to the fishing community, but is also not effective enough in ensuring protection to the turtles. With the terrestrial system of conservation in operation in the marine space, the basic objective of protection of the species is not achieved.

The trawler operators complain that the entire GMS is declared a closed area for them for the entire year, whereas the turtle season is for nine months.

To date, several fisherfolk do not possess any permits to enter the GMS to fish in the core zone. Several fisherfolk are still not aware of their rights and restrictions in relation to the GMS.

3. Ban on Gear and Fishing in Restricted Areas

Through protracted and difficult months, the OTFWU was able to bring to the notice of the Orissa State Government and the CEC its concerns regarding the blanket ban on all gill-nets in Devi and Rushikulya. The blanket ban did lead to a great deal of discontentment among the fisherfolk, especially among the traditional communities of the southern districts of Ganjam and Puri. Fisherfolk at Gopalpur reported that there were instances of detainment of fisherfolk in areas off Rushikulya. However, these fisherfolk were operating small monofilament nets. They state that 'fines' to the tune of Rs2,000 were imposed on some of the fisherfolk from Gopalpur. They were not given any *challans* or receipts for the 'fines'. At Rushikulya, some monofilament nets were confiscated from the fisherfolk of nearby Nuagaon village.

At present, the trawlers are restricted from fishing within a 20-km seaward distance at Devi and Rushikulya. The CEC's restriction on gill-nets in the Devi and Rushikulya coastal waters was interpreted by the State government to include all fishing craft that utilised gill-nets.

4. Proposed Devi and Rushikulya Marine Sanctuaries

The present framework of a marine sanctuary as seen at GMS is restrictive and promises to breed conflict. The current process of declaration of a 'protected area' does not involve a process of consultation with fisherfolk. The situation at Gahirmatha also indicates that the lack of a process of consultation and participation with fisherfolk in conservation measures is responsible for the present conflict. At present, the conservation system vests much power with the Forest Department. While the official process towards declaration of these new protected areas has been under way for a while now, none of the fisherfolk has any information about this process having been initiated. Declaring the Devi and Rushikulya areas as marine sanctuaries before reviewing and reforming the current legal framework and resolving the present conflicts is neither advisable nor prudent. Already, there are restrictions on fishing practices in the area. These two areas have reported incidents of harassment by field officials of the Forest Department. There is a very real apprehension that the declaration of a marine sanctuary will lead to more harassment from the Forest Department.

5. Fishing Restrictions on Trawlers

The various trawler association representatives also have concerns with respect to the regulations on their fishing activities. They state that having a regulation such as the compulsory usage of TEDs leads to a loss in fish catch. Also, the regulation requiring TEDs mandates their usage throughout the year, even in the non-turtle season. The trawler representatives state that, coupled with the restrictions on fishing by trawlers in the GMS, the two no-fishing zones off the Devi and Rushikulya make for excessive regulations on their activities. The trawlers off the Devi river mouth state that their wooden trawlers do not have the capacity to trawl beyond the 10-km distance. They, therefore, want a reduction in the size of the restricted zones in these two areas. They also state that none of the areas has any physical boundaries and this makes for the abuse of powers by the Forest Department. They state that certain clear procedures need to be put in place to ensure that no fisher is unfairly arrested and also that information about these procedures is made available to them. The trawler owners state that the rights of fisherfolk should be spelt out clearly and that this would reduce considerably the amount of corruption and harassment from the Forest Department.

6. Impacts of Conservation Measures on Women

The present conservation measures cut off the fisherfolk's access to a portion of the coast. In the case of the gill-net ban, this means that the traditional fishers stand to lose considerably in terms of access to fishing grounds. This translates into reduced incomes for fisher households, and places great stress on women who have to manage the household with meagre resources. As illustrated earlier, the women of the fishing community are in a tenuous condition where the struggle for survival is evident. By virtue of occupying a low status in the home and society, a lower income to the fishing community is immediately translated into poor health conditions for women and increased vulnerability. The inroads made by male merchants into activities such as fish processing and the sale of fish, which were earlier exclusively the domain of women, has further marginalized women. Markets are now not just competitive but also provide lesser space and financial security to women. For women whose labour revolves around a natural resource, its natural depletion or artificially restricted availability through fishing restrictions has serious repercussions.

Women from the traditional fishing communities across the coast say that the arrest of fisherfolk for violation of fishing restrictions creates misery for the families. The bribes paid lead to reduced incomes, greater indebtedness to moneylenders and more vulnerability. Thus, in the context of the poverty of the traditional fishing community, the implications of conservation-induced vulnerability are severe.

Chittamma of *Samudram* states that the insecurities of women's lives are compounded by the dangers involved in fishing itself. When fishermen lose their lives at sea, there is no way of procuring any benefits for the family. The women of these families bear the brunt of the tragedy. In fact, losses are beyond that of the loss of life. The greater tragedy really is the lack of recognition of fisherfolk. Having no formally recognized identity makes availing of life insurance claims problematic. She states that *Samudram* joins the OTFWU in demanding identity cards for all fisherfolk.

Chittamma believes that the recent conservation measures that involve restrictions on fishing even by the traditional fisherfolk are misplaced. She states that the nets of the traditional fisherfolk from the Ganjam and Puri belt do not cause turtle mortality. *Samudram* has been at the forefront of the protests over the CEC's former ban on all gill-nets at Devi and Rushikulya.

E. Achieving Conservation Goals and Meeting Livelihood Needs: Options for the Future

In an area where the number of nesting turtles is as large as in Orissa's coastal waters and where fisherfolk are not just a sizeable part of the State's population but also highly vulnerable, conservation options must be prioritized. Instituting conservation programmes that seek to protect every single turtle may not be warranted. Restrictions on fishing in turtle congregation areas would have to include time, area and gear restrictions that need to be decided with the participation of the different fishing communities. At present, the OTFWU has issued a ban on the ring-seine, nylon multifilament large-meshed ray net (*sankutch jaal*) and sea bass net (*bhetki jaal*). Such a move is rare and difficult to even initiate among fisherfolk and needs to be supported. In turn, a big step needs to be taken by the government, by involving the fishing communities in conservation efforts.

The conservation measures in place in Orissa do not, at present, take into consideration the sensitivities of fisheries, particularly those of traditional fisherfolk. Considering the fragile situation of the traditional fishing communities of Orissa, marine conservation efforts need to view fisheries management as an integral component. Discussions with the fishing communities across various categories, turtle biologists and conservationists indicate that isolated turtle protection measures cannot meet with success. The fishing community needs to be viewed as an inextricable part of the marine space.

With specific reference to Orissa, a few steps need to be urgently taken:

- The process of consultation should continue beyond those mandated by legal interventions and orders, particularly that of the CEC. A series of consultation between fisher representatives, the scientific community and conservationists and the government should be initiated at the earliest. This would afford an opportunity to chalk out a revised conservation plan for implementation in the next turtle season.
- Efforts to understand the fishing practices along the Orissa coast must accompany the conservation planning process.
- The legal framework of conservation, particularly in marine areas, should be revised to factor in participatory decision-making.

- Conservation should result in the enhancement of sustainable livelihoods of the local fishing communities.
- For conservation goals to be achieved, the participation of local people, particularly fisherfolk, is central. The knowledge and understanding of the marine areas and the coastal communities is best among the fishing communities. Conservationists are better off working in partnership with communities, rather than isolating them in their conservation efforts.
- There needs to be greater co-ordination among the various departments, particularly the Fisheries and Forest Departments, along with forces such as the Coast Guard, which perform a policing duty. The objectives of both these departments would have to be reviewed, keeping in mind the livelihoods of the fishing communities and relevant conservation methodologies.
- There needs to be greater accountability and transparency in deciding on matters affecting the fishing community, such as decisions that force them to seek alternative employment. The issue of who bears the onus of such alternative employment needs to be debated. Perhaps viewing protection measures as a form of 'displacement' and alternative employment as 'rehabilitation' will assist in viewing the issue from the perspective of human justice.
- The question to ask is: which aspects of traditional livelihoods are conservation measures likely to have an impact on? The key components of the livelihoods of fisherfolk would include their assets, capabilities and capacities to generate a means of living. 'Sustainable livelihoods' refers to the ability of the selected livelihoods to continue generating the means of living. This also indicates that for sustainability to be achieved, certain conditions need to be met: equity, ecological balance, and participatory decision-making regarding resource utilization and conservation.
- The direct and indirect impacts of conservation on women's labour do not always come to the fore. Planning for conservation must factor in the concerns of women in these fishing communities.

Finally, wildlife enthusiasts, environmental courts, conservationists, scientists and fisherfolk unions need to recognize that the turtle

conservation question will find an answer in a fisheries management effort. Orissa's affair with sea turtles and the State's fisheries history, as illustrated in this report, demonstrate that options for marine conservation need to primarily recognize fisherfolk as part of the marine space. Bold measures, open minds and faith in dialogue alone will take us into a new turtle season where both the turtle and the fisher co-exist.

Endnotes

¹ The region had well-established maritime trade relations with Java, Sumatra and other Southeast Asian regions.

² The Bay of Bengal Programme began in 1979 as a regional marine small-scale fisheries programme of the Food and Agriculture Organization of the United Nations (FAO). The countries concerned with this programme were India, Bangladesh, Maldives, Indonesia, Malaysia, Sri Lanka and Thailand.

³ The actual mass-nesting site at Gahirmatha is at the northern end of the shoreline of the Gahirmatha Marine Sanctuary.

⁴ The RSTPC (Reg. No. 7285–107), based in Puruna Bandha village, Ganjam, consists of members of the local communities near Rushikulya, and was formed to promote turtle research, conservation and awareness activities.

⁵ Personal communication from meetings in February 2004

⁶ *Muhana* is the Oriya word for a river mouth

⁷ The title of the Wild Life Protection Act, 1972 (53 of 1972) states that it is “*an Act to provide for the protection of wild animals, birds, plants and for matters connected therewith or ancillary or incidental thereto with a view to ensuring the ecological and environmental security of the country.*”

⁸ Plants and animals in Schedule 1 of the WLPA are accorded the greatest degree of protection, with all hunting and trade in their products being prohibited.

⁹ The words ‘seaward radius’ were changed to ‘seaward distance’ in order dated 7.6.2002 of the Dept. of Fisheries

¹⁰ The CEC was appointed by the Supreme Court of India vide Notification File No.1-1/CEC/SC/2002. The rules and procedures of the CEC are outlined in Notification No. 2 No. 1-1/CEC/2002, Date: 20.6.2002. The CEC was constituted primarily to deal with the large number of cases pending with the Supreme Court on matters related to forest laws, the WLPA and other environmental laws in India.

¹¹ Constituted by the State Government to decide and advice on matters related to the conservation of Olive Rيدleys in Orissa

¹² Parentheses added.

¹³ Discussions with fisherfolk leaders at villages like Kharnasi, Tantiapal, Jamboo, etc., reveal that they were not consulted or even intimated of the decisions on fishing rights within the sanctuary limits.

¹⁴ Discussions with Dr. Bivas Pandav (January 2004) and Basudev Tripathy (February 2004).

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All over the world, the pressure to conserve ecosystems and their resources has been steadily rising. This has, in turn, led to conflicts between conservation imperatives and the livelihoods' needs of the communities that interact with these ecosystems. An example of the impasse that such a state of opposition can lead to can be found in Orissa, India, where the moves to implement official sea turtle protection measures along the coast have resulted in mounting conflicts involving fisherfolk, government departments and conservationists.

This study analyzes the existing sea turtle conservation measures in Orissa and the implications of conservation approaches for the livelihoods of fisherfolk, particularly for traditional fishing communities and the women in them. The study concludes with an assortment of views and strategies that could help achieve the goal of turtle conservation, while sustaining the endeavours of fishworkers and fishing communities to maintain their livelihoods.



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