

Fishing Community Issues in the Sundarban Tiger Reserve (STR)¹

REPORT

International Collective in Support of Fishworker Chennai

¹ This study, by Varsha Patel and Ramya Rajagopalan, is based on information from the report titled “Traditional fishers in the Sundarban tiger reserve: A study of livelihood practices under protected areas”, by the Society for Direct Initiative for Social and Health Action (DISHA) and additional information collected by the International Collective in Support of Fishworkers (ICSF). This study was prepared by ICSF for distribution at the workshop.

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List of Acronyms

BLC	boat licence certificate
CMFRI	Central Marine Fisheries Research Institute
COR	compounded offence report
DISHA	Direct Initiative for Social and Health Action
EDC	eco-development committees
FPC	forest protection committees
GPS	global positioning system
ICSF	International Collective in Support of Fishworkers
IDPAD	Indo-Dutch Programme on Alternatives in Development
PA	protected area
POR	prosecution report/charge sheet cases
SBR	Sundarban Biosphere Reserve
SDB	Sundarbans Development Board
SHG	self-help groups
STR	Sundarban Tiger Reserve
SUCI	Socialist Unity Centre of India
UDOR	offence detected offenders not found
UNDP	United Nations Development Programme
WLPA	Wild Life (Protection) Act

Executive Summary

The study focuses on fishing community issues in the Sundarban Tiger Reserve (STR). It provides an overview of the legal framework, and design and implementation of fishing regulations, and documents and analyzes the experiences of local fishing communities. It explores ways in which livelihood concerns can be appropriately balanced with conservation. The report builds upon a study titled 'Traditional Fishers in the Sundarban Tiger Reserve' (DISHA 2008) and draws upon secondary review of literature and field visits conducted in September 2008.

The report is structured in six parts. The first part provides the legal background and the second sketches the status of fisheries and fishing communities. The third part focuses on livelihood issues within the STR, and community concerns regarding implementation of tiger protection measures. Part four explores the initiatives undertaken in the domain of alternative livelihoods. Part five offers a conclusion. The final sixth part, recognizing the initiatives that have been taken to address alternative livelihood options, lists the study's recommendations.

The Sundarbans is the largest mangrove forest in world, located in the delta of the Ganges and Brahmaputra rivers, in West Bengal, India. This unique region has overlapping protected area (PA) designations under the Wild Life (Protection) Act (WLPA), 1972, (as amended in 2002 and 2006): Core or Critical Tiger Habitat (2007), National Park (1984), and Wild Life Sanctuary (1976). It was earlier declared as the Sundarban Tiger Reserve (1973), under the Project Tiger of the Ministry of Environment and Forests. Other special designations are the World Heritage Site and Biosphere Reserve (SBR) (1989). The Sundarban Tiger Reserve is managed by the Conservator of Forests and Field Director, STR, and fishing licenses, permits and identity cards for fishing in the STR are issued by the Forest Department.

Fishing is a major livelihood in the region, alongside wage labour, agriculture, and crab and prawn seed collection. The main craft used in the Sundarban region are the *naukas*, and popular fishing gear are dragnets, shore seines, gillnets and fixed bagnets. Fishing villages often have poor access to potable water, basic transportation, electricity, education and health facilities.

Extractive activities, including fishing, are prohibited in the Critical Tiger Habitat, or the core of both the STR and the SBR. Non-motorized craft, with boat licence certificates (BLCs), seasonal passes and permits for using dry fuel, are permitted to fish in the intertidal waters that form the buffer zone of the STR. Motorized fishing is prohibited within the STR, requiring fishers living closer to the STR, to take long detours to reach their fishing grounds, increasing their operational time and costs.

Violations are booked under three main categories, the most common being the compounded offence report (COR), or violations that are fined but are not charge-sheeted. Fishers report that fines levied for violations, and for delay in re-issuing/renewing permits, are confusing, and that there is little relation between the type

of offence, the amount of fine and their socioeconomic condition. Fishworker unions have differing views on fishing restrictions. One group opines that all restrictions should be removed, while another group is advocating for “restrictions with a human face”.

Human-animal conflicts persist despite the Forest Department’s continuous efforts to minimize them. There are important issues related to compensation in cases where fishers are killed by tigers, as (i) the compensation amount is considered inadequate; and (ii) families of fishers considered to be fishing illegally are not provided any compensation.

The short-term and longer-term alternative livelihood opportunities provided include activities of social forestry, and rearing of poultry, goats, ducks and sheep. Currently the Forest Department alone has formed 25 eco-development committees (EDCs) and forest protection committees (FPCs) in villages on the STR’s fringes.

Among the recommendations of the study are: collection of gender-segregated, socioeconomic data for populations dependent on resources in the STR; enhancing co-ordination between different agencies in the STR; ensuring collection of systematic information on fisheries resources, craft and gear by the Fisheries Department; developing and implementing management plans of the STR in a participatory manner, with the active participation of women; ensuring transparency and consistency in recording and fining offences; and simplifying procedures for issue/re-issue of permits. Navigational passages to allow motorized vessels to pass through the buffer area to reach their fishing grounds, could be demarcated.

Forest Department officials should be trained in participatory conservation methods, while the fishing communities need to be trained in conservation and patrolling techniques, so as to enable better conservation of resources.

Access to formal credit could support both fishing- and non-fishing-based livelihoods, and alternative livelihood initiatives could be sustained by strengthening market linkages and through a gender perspective. The coverage, activities, structure and processes of the EDCs and FPCs could be revised for better conservation and management, and for addressing issues of rural development and alternative livelihoods.

Seasonal livelihood options generated by ecotourism must be ensured to have low impacts on the ecosystem, and their costs and benefits must be equitably shared. Threats to the ecosystem arising from pollution, oil spills and mangrove destruction also need to be addressed.

The study advocates a holistic and balanced approach to protection and propagation of wildlife habitats, built on participatory livelihood approaches and principles of sustainable development, within the existing legal and policy framework. The provisions of the WLPA, providing for the involvement of the *gram sabha*, and of the Forest Rights Act, 2006, regarding recognition of the bona fide livelihood needs of traditional forest dwellers who are dependent on, but do not necessarily reside within, the forests, need to

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be taken into account, as also the recommendations of the Tiger Task Force (2005) on reinvigorating institutions of governance.

Fishing Community Issues in the Sundarban Tiger Reserve (STR)

Introduction

The Sundarbans is an intricate web of tidal waterways, seawater, rivers, creeks and mudflats, formed by the gradual deposition of alluvial silt, at the merger of the Ganga and Brahmaputra rivers in the Bay of Bengal (Chowdhury 2007). The Sundarbans, named after the *sundari* (*Heritiera fomes*) and the *bani* (*Avicennia officinalis*) mangroves, is a unique ecosystem—the largest delta and estuarine mangrove forest in India, and a habitat of the tiger (*Panthera tigris*).

The Sundarbans constitutes an area of 26,000 sq km, of which 9,630 sq km is in Indian territory and the rest in Bangladesh (Gupta 2001). The Indian component constitutes 106 islands, of which 54 are inhabited, located in 13 blocks in 24 Parganas South District and six blocks in 24 Parganas North District, with a population of 4.2 mn (2001 census).

The biodiversity of this unique ecosystem comprises various species of fauna, including 120 species of fish, olive ridley turtles, sharks and crocodiles. The main occupational groups in the Sundarbans are fishers, the *bowalis* (wood cutters/*golpatta* collectors), and the crab and shell collectors (UNDP 2001). Fishing is one of the primary sources of livelihood of the local, forest-dwelling population, as few people have access to agricultural land.

The Project Tiger was implemented in 1973 as a centrally sponsored scheme of the Government of India, with the objective of ensuring a viable population of tigers, for scientific, economic, aesthetic, cultural and ecological value². The Sundarbans became one of the first tiger reserves to be notified under the Project Tiger scheme. However, it did not have the legal status of a PA, as there was no such category under the Wild Life (Protection) Act 1972 at the time. The WLPA Amendment in 2006 legally recognized tiger reserves as a PA category, and the ‘core or critical habitat’ of the Sundarbans tiger reserve was notified in 2007³. Besides this, the Sundarbans has multiple designations -- as PA, under the WLPA, and as Wildlife Sanctuary and National Park, as well as Biosphere Reserve and World Heritage Site. Certain areas of the mangrove forests of the Sundarbans are also designated as Reserve Forests under the Indian Forest Act, 1927.

This study specifically focuses on social issues in implementation of protection measures in the STR, which includes the Sajnekhali Wildlife Sanctuary and the Sunderban National Park (see Figure 1). The first part of the paper provides an overview of the legal, institutional and management processes in the Sundarbans PAs. The second part provides a brief background of the fisheries and fishing communities in the area. The third part focuses on livelihood issues within the STR, and community concerns regarding implementation of tiger protection measures. Initiatives undertake to address livelihood

² Project Tiger, Available online at: <http://projecttiger.nic.in/>

³ Notification No. 6028-FOR, dated 18 December 2007, by the Forest Department, Government of West Bengal. Recent reports point out that this notification is not valid, as it did not follow the procedure set forth under the WLPA.

issues are dealt with in the fourth part of the study. The last two parts provide the conclusions and the recommendations.

Part I: Legal, Institutional and Management Overview

The Sundarbans was first designated as a protected forest in 1878, and subsequently as a Reserve Forest ⁴ in 1928, under the Indian Forest Act, 1927. Extractive activities such as fishing, and honey and wood collection were allowed with permits and registration certificates issued by the Forest Department⁵.

The various categories of PAs within the Sundarbans are presented in Table 1 and Figure 1.

Table 1: Protected Area Designations in the Sundarbans

Legal designation and year	Area (sq km)	Activities prohibited/restricted/regulated
Sundarban Tiger Reserve (STR), 1973 ⁶	2,585 sq km— 1,600 sq km is the land component, and 985 sq km is the water component	“Core” or “Wilderness zone”: Area of 1,330 sq km is absolutely free of any human interference, There is a buffer zone in which activities are regulated through government orders
Core or Critical Tiger Habitat, 2007 ⁷	1699.62 sq km	This is the newly designated core of the STR, where all activities are prohibited
Sundarbans National Park, 1984 ⁸ (World Heritage Site) ⁹	1,330 sq km	All forms of hunting and fishing are prohibited in the National Park, the area of which also forms the core of the STR
Sajnekhali Wildlife Sanctuary, 1976 ¹⁰	362.40 sq km	All forms of hunting and fishing are prohibited in the Wildlife Sanctuary, which forms a part of the buffer area of the STR
Sundarbans Biosphere Reserve ¹¹ , 1989 (includes the STR and Reserve Forest and human settlements around it)	9,630 sq km. It covers the delta of the Ganges-Brahmaputra	Designated into Core Area, Buffer Area and Transition Zone ¹² . Core Area: approx. 1,700 sq km. It includes the National Park. The Buffer Area comprises a majority of mangrove areas, including Reserve

⁴ Notification No. 15340-FOR, dated 09 August 1928

⁵ A brief history of the Sundarbans - Sumit Sen, Available online at: <http://www.kolkatabirds.com/sunderhistory.htm>

⁶ The Sundarban Tiger Reserve (STR) was established by the Government of India Order, dated 23 December 1973, under the “Project Tiger” Scheme of the Ministry of Environment and Forests

⁷ Recommendations from the expert committee (Government of West Bengal’s Office Order No. 12-M/8-2007, dated 4 November 2007) set up by the Principal Chief Conservator of Forests (Wildlife) [□], and the National Tiger Conservation Authority (Memo No. 1501/11/2007-PT, dated 3 December 2007).

⁸ First notification in 1978 by Notification No. 3640 FOR, dated 6 June 1978, final Memo No. 2867-FOR/11B-6/83-4 May 1984

⁹ http://whc.unesco.org/archive/advisory_body_evaluation/452.pdf

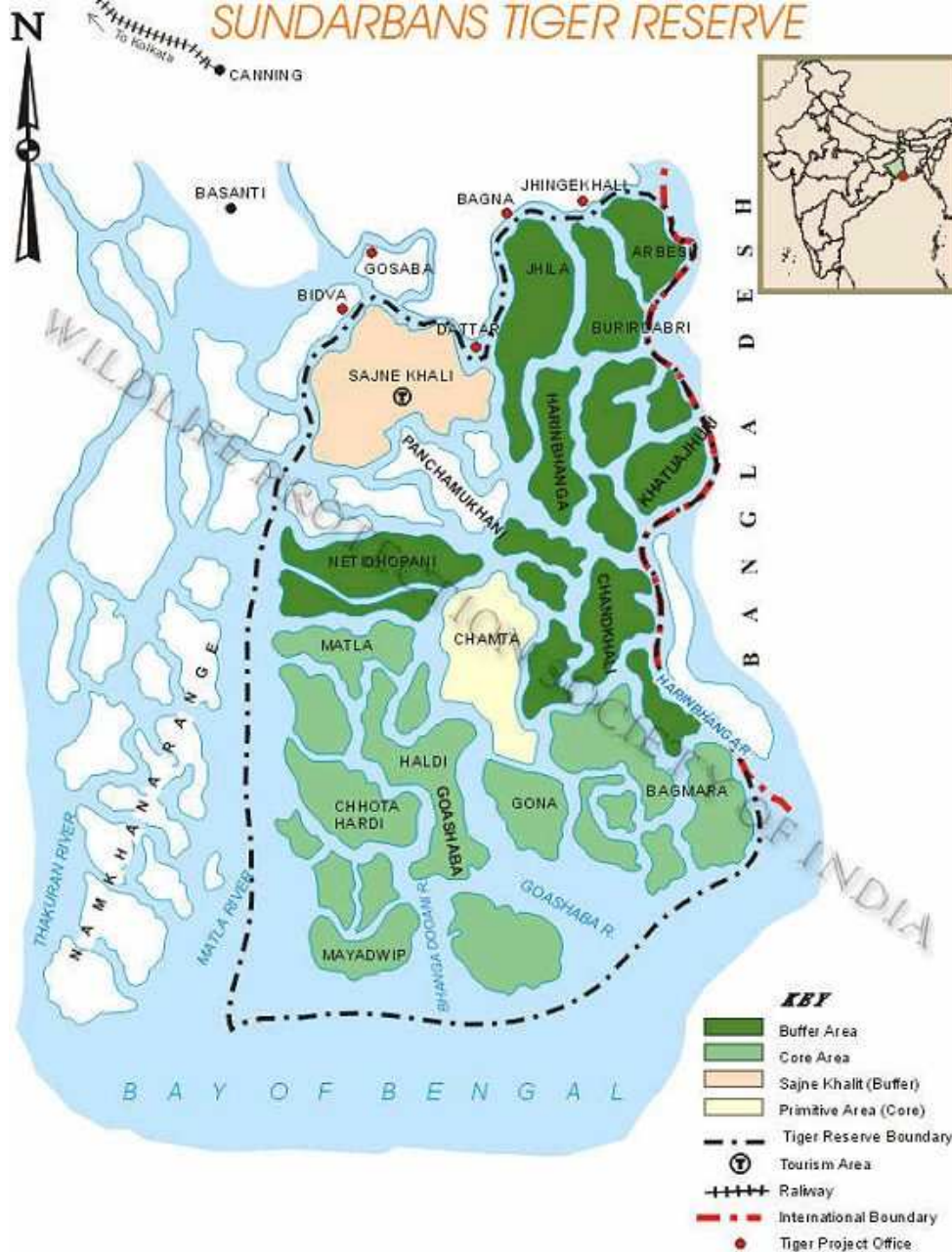
¹⁰ Notification No. 5396-FOR, dated 24 June 1976. The forest blocks comprising the Sajnekhali Wildlife Sanctuary are Panchamukhani and Pirkhali in 24 Parganas District. The boundaries are annexed.

¹¹ Notification No 16/6/84-CSC, dated 29 March 1989

¹² The Core Zone of the Biosphere Reserve is a compact block of Reserve Forest covering approx. 1,700 sq km lying in the eastern portion of the Sundarbans adjoining the Bangladesh border. The Buffer Zone comprises of mangrove areas, including the Reserve Forests surrounding the above Core Zone and a portion of the Buffer Zone of the tiger reserve, the Sajnekhali Wild Life Sanctuary and the compact Reserve Forest blocks lying between Matla and Thakuran rivers under 24-Parganas South Forest Division. The Transition Zone covers the balance of the Biosphere Reserve area, which comprises mangrove areas, mostly in non-forest areas and reclaimed areas where agriculture is practised.

	river system, south of 'Dampier-Hodges Line'.	Forests. The Transition Zone comprises mangrove areas, mostly in non-forest areas and reclaimed areas with agriculture.
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Figure 1: Map of Sundarban Tiger Reserve



The Sundarban Biosphere Reserve (SBR) thus comprises a larger area, and includes the STR and the Reserve Forests around the STR, as well as human settlement areas. The Sundarbans National Park and the Sanjekhali sanctuary are located within the STR boundaries. Thus, of the total forest coverage of 4,263 sq km in the Indian Sundarbans, 2,585 sq km is designated as STR. There is no human habitation within the STR area and in the Reserve Forests. Villages are located only in the fringe areas (see Figure 2). The SBR area is spread across 24 Parganas North and South Districts¹³ (see Appendix I), while the STR is located mainly in the 24 Parganas South and partly in 24 Parganas North District¹⁴.

The STR, National Park, the Sajnekhali sanctuary and the SBR are managed by the Conservator of Forests and Field Director of the STR, under the Directorate of Forests, Government of West Bengal.

Management plans and working plans have been developed regularly for the STR, with clear-cut guidelines on what activities need to be regulated and restricted. The earlier working plan (Sundarban Tiger Reserve, 1973-74 to 1978-79) specifies permitted activities, under a high degree of regulation, such as grazing, honey collection and fishing in the Buffer Area. It specifically mentions that fishing is allowed free in tidal waters, provided the fishing boats are registered and they pay the annual registration fees and royalty for using dry firewood (Sundarban Tiger Reserve, 1973-74 to 1978-79: 32). The focus of these plans was on preserving a viable population of tigers. Tourism was identified as a solution to the poor economic growth in the area, and to poverty alleviation.

The management plan, operational from 2001 and valid up to 2010-2011, mentions that fishers are allowed to fish within the Buffer Area of the Sundarbans according to existing legislation applicable to the area, provided they do not disturb the habitat and the wildlife. Only non-motorized fishing is allowed in the Basirhat range located in the Buffer Area, which includes areas outside the National Park/Core Area of the STR, and the sanctuary in the Buffer Zone¹⁵.

An advisory committee was formed in 2007 to render advice on the management of the Sajnekhali wildlife sanctuary¹⁶. The committee, at its first meeting, decided to unanimously curb illegal fishing within the sanctuary and to provide alternative livelihood opportunities to the local fishermen. It also decided to ban tiger prawn seedling collection and to regulate tourism in the sanctuary area¹⁷.

¹³ The biosphere reserve includes 13 blocks in the South 24 Parganas District and six blocks of the North 24 Parganas District.

¹⁴ STR Annual Report 2005-06

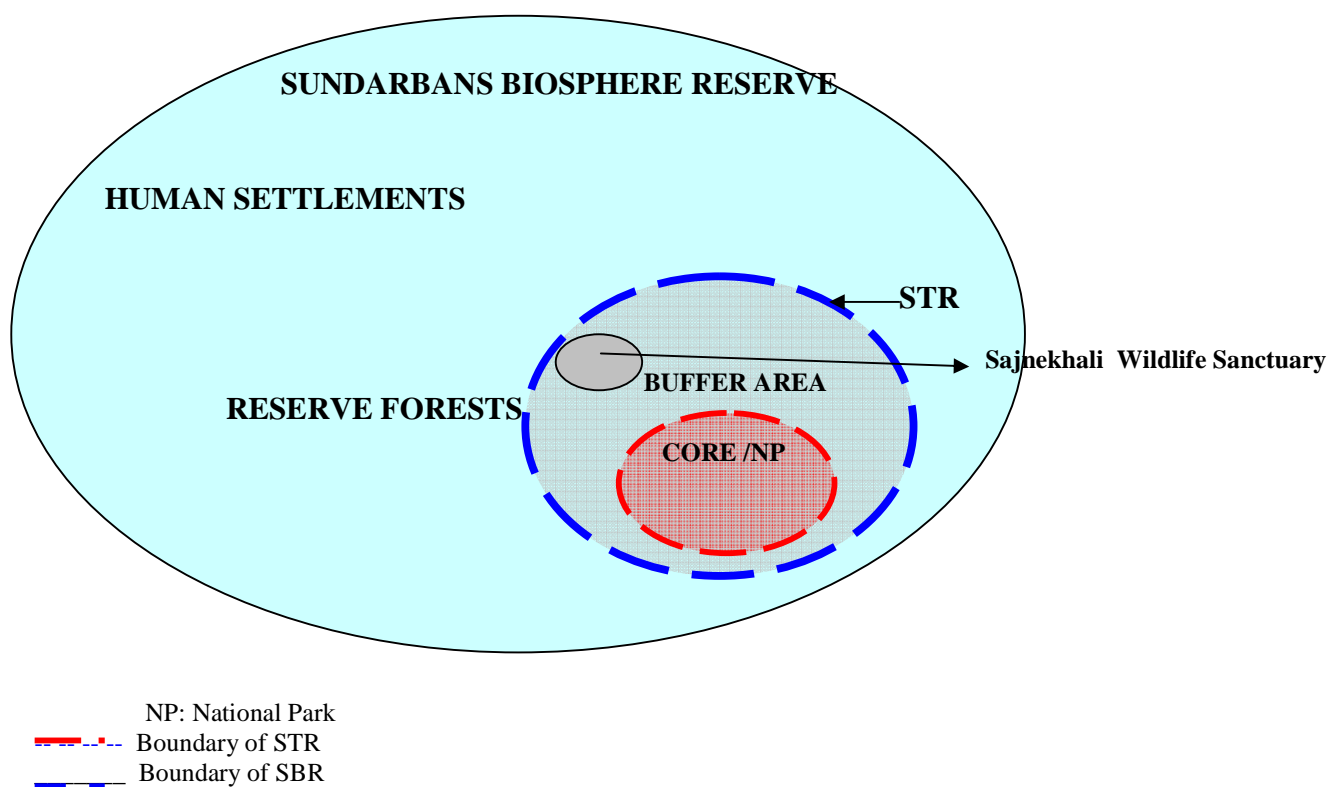
¹⁵ Email from Field Director, STR, dated 30 September 2008

¹⁶ Notification No. 3851-FOR/11M-16/07, dated 27 July 2007. The Government of West Bengal constituted the committee with 14 members, including one Legislative Assembly Member, two members of the *gram sabha* and a member from the Bon-O-Bhumi Sthayee Samithy and Juktibadi Sanskritik Sanstha, Canning, besides members of the Forest Department, and non-governmental organizations.

¹⁷ Minutes of the first meeting of the Sajnekhali Sanctuary Advisory Committee, held on 5 December 2008, at the Office of the Conservator of Forests and Field Director, STR, Canning.

The Forest Department is involved in setting up eco-development committees (EDCs) and forest protection committees (FPCs) (see Appendix II for a list of EDCs/FPCs)¹⁸. Local villagers who are members of these committees can extend their help in resource protection, rescue of wild animals, and in the management of wildlife stray-out cases. Similar programmes are undertaken in the non-forest area of the SBR region, as part of SBR activities, in co-ordination with the Sundarban Development Board (SDB)¹⁹, to carry out development activities.

Figure 2: Sundarbans Protected Areas



Areas in which fishing is prohibited:	Core of STR/NP, and Sajnekhali wildlife sanctuary
Areas in which fishing is permitted:	(i) Buffer Area of STR: boat licence certificates (BLCs)/passes needed, and (ii) in the reserve forest: BLCs/passes needed

Regulations on fishing

One important provision regulating fishing is the restriction on the number of boats that can fish in the permit area, through the boat licence certificate (BLC) issued by the Forest

¹⁸ 14 EDCs and 11 FPCs have been set up in the STR.

¹⁹ The SDB is administratively under the Sundarbans Affairs Department of the Government of West Bengal, created in 1994 to enhance co-ordination and development work in the Sundarbans region. The geographic span of SDB's work is outside the 2,584 sq km of the Tiger Reserve and the Reserve Forest. A key activity has been connecting the areas via roads and bridges, undertaken by the engineering division of the SDB, alongside social forestry, agriculture and fishery.

Department. BLCs were first issued in the 1980s, separately for the area covering the STR and for the other Reserve Forests. BLCs were issued to individual boatowners, and each BLC entitles a fishing boat to undertake fishing. The BLCs carry the name and address of the boatowner, along with the description of the boat. There were 923 BLCs that were issued for fishing in the STR, based on an assessment undertaken by the Forest Department and the Fisheries Department²⁰. Another 3,700 BLCs were issued to fishers in the Reserve Forest area. No additional BLCs have been issued subsequently, so this number has remained fixed at 914, as records of nine BLCs could not be traced for the later period. Currently, out of the 914 BLCs in the STR, only 709 are actively used for fishing²¹. The other BLCs are not valid, as they are not renewed by the owners (see Appendix III).

The BLCs are non-transferable and can only be mutated in favour of a blood-related member of the family and/or to genuine fishers. The rules and regulations for transfer to blood-related members are set up by the *zila parishad* member, while the rules and regulations for transfer to genuine fishers have not yet been formulated. The BLCs need to be renewed on an annual basis, upon payment of registration fees, which are based on the capacity of the fishing boat, measured in quintals (see Appendix IV). Fishers used to also pay an annual amount of Rs 40 per person per season for the seasonal pass issued by the Forest Department for fishing during the period August to March.

Besides the BLC and the seasonal pass, fishers also need to have a permit issued by the Forest Department to allow them to fish or trade in fish. These permits are issued to the BLC owners at the rate of Rs 5 per person per week, for a period of 42 days. In cases of overstaying beyond 42 days, the fishers are supposed to pay Rs 6 per person per week (for the first four weeks), Rs 10 per person per week (for the next two weeks) and, for periods beyond that, the amount is Rs 15 per person per week. The permits are also applicable for the crab fishers, who are charged Rs 10 per gear per trip²². The information contained on the permit includes the names of the crew and their life insurance policy numbers²³, and a description of the gear used for fishing. The permit amount collected from fishers is also sometimes termed as dry fuelwood cost (DFC) in the official records (see Appendix III). It is a mandatory requirement to carry the three documents—the BLC, the seasonal pass and the permit—on each fishing trip within the permitted areas of the STR.

Apart from restrictions on the number of boats that are allowed to fish, there is also an annual closed season for fishing for 90 days, from 1 April to 30 June²⁴.

²⁰ Based on discussions with Pranabesh Sanyal, who was the Forest Officer in 1980, when the BLCs were first introduced (Discussion at his residence on 6 September 2008).

²¹ As on 30 September 2008.

²² Email communication with Field Director, STR, dated 30 September 2008

²³ Fishers who are fishing in the permit area of the STR should have life insurance policy, insured for an amount of Rs 25,000 at an annual premium of Rs 25, which is paid by the fishers.

²⁴ This is based on the discussion between the STR and all concerned fishermen's associations in July 2007, when the decision was taken unanimously to have a 90-day closed season. (Source: Email communication from the Field Director, STR, dated 30 September 2008).

Fishing in the area is also regulated through the West Bengal Inland Fisheries Act, 1984, amended in 1993 and 1997²⁵, along with the Rules notified in 1985, implemented by the Fisheries Department²⁶, and which is applicable to areas outside the forest jurisdiction.

Individual fishers are recognized, by both the Fisheries and the Forest Departments, through the identity cards issued to them that enable them to fish. The Fisheries Department identity card entitles fishers to welfare and insurance schemes administered by the Department. The Forest Department started issuing identity cards to fishers fishing within the STR area only in 2008, and 555 cards were issued to boatowners, and 2,119 to the crew²⁷ fishing in the area. The STR authorities had initially proposed to issue identity cards for crew and owners, with information on the boat on which the crew worked (with the BLC number), in effect tying the crew to the BLC owner. However, this proposal was later withdrawn after discussions with the fishers²⁸, and individual identity cards were issued.

Fishers issued with identity cards are covered under the Accidental Life Insurance Scheme for Rs 100,000 by the STR authorities. The Forest Department is also planning to form self-help groups (SHGs) of fishers with identity cards, which will undertake activities similar to those of FPCs and EDCs²⁹.

Part II: Sundarbans: Fisheries and Fishing Communities

Fishing is a major source of livelihood for communities living in the fringe area of the Reserve Forests and the STR. Around 2,069 sq km inside the Reserve Forest are considered ideal for riverine fishing using traditional methods (Nanda, Kiranmoy, in Mukherjee, 2007:3)³⁰. Historically, fishers in the Sundarbans have enjoyed the right to fish without paying fees and without being restricted by the movement of cargo ferries and ships, due to the rights established by Rani Rashmoni in her struggle against the restrictions imposed by the British on fishing across the navigational channels³¹.

²⁵ Notification No.1711-L dated 14 September 1984; Amendments (WB Act of XIX of 1993 and WB Act XXI of 1997)

²⁶ The objective of the Act is to provide for the conservation, development, propagation, protection, exploitation and disposal of inland fish in West Bengal. The Act makes provisions for the State government to restrict any specified area for any specified period of fishing of specialized size, group or species of fish. It regulates activities such as construction of temporary or permanent weirs, dams or *bundhs*, and usage of nets and mesh size. The Act also prohibits the use of destructive fishing gear, and bans the discharge of pollutants, including from industrial activities and sewage, which might affect the health of the fish.

²⁷ As on 30 September 2008

²⁸ Fishers pointed out that the crew is not restricted to working on one boat for the entire season; that they may shift to another boat, enabling them to bargain for better wages etc. The owners also felt that, by binding them to a particular set of crew, their profits would be curtailed.

²⁹ As on 30 September 2008, based on e-mail communication from the FD, STR.

³⁰ The local fishers utilize approximately 1,720 sq km of river canal water, while the identified potential area for brackish water fisheries in North and South 24 Parganas Districts is around 1.80 lakh ha.

³¹ This is based on discussions with Harekrishna Debnath of NFF.

The estimated total number of inland fisherfolk families in 24 Parganas South District is 52,917, and in 24 Parganas North District, 50,897 (see Figure 3) (Government of West Bengal 2005)³². The 24 Parganas South District has a marine fisherfolk population of 2,69,565, with an active fisher population of 70,750, located in 237 villages (CMFRI 2005). In the 24 Parganas North District fishers do not have access to marine waters.

Fishing is a seasonal occupation for communities in the area. While most fishing is undertaken by men, crab fishing and prawn seed collection are practised by both men and women in the inter-tidal waters³³. Besides fishing, most people have other sources of livelihood, also seasonal, such as small businesses and mono-crop agriculture (Jalis, 2007). Some work as daily labourers. Prevalent cultural belief systems and myths of traditional communities in Sundarbans are predicated on a deep respect for nature.³⁴

Fishing communities in the Sunderbans live in harsh and demanding conditions, as, in most cases, their villages are in remote areas, with minimal or no access to potable water, basic sanitation, education and health facilities. The Sundarbans Development Authority, constituted in 1973, is responsible for undertaking development activities in the region. According to reports, in the 4,500 sq km of inhabited area, there is only 42 km of railway track and 300 km of motorable road network. There is no proper public transport network and most of the areas can be accessed only through waterways. The inaccessibility of most inhabited areas also inhibits conventional electricity supply³⁵. Access to health services is poor, with most villages located six to eight hours away from secondary healthcare facilities and hospitals. Even access to primary health centres with adequate facilities is problematic (IDPAD_case 13 sundarbans, 2007). The basic means of transportation between most of the villages, located in isolated islands, is through mechanized or non-motorized boats. The remoteness and inaccessibility of most villages is one of the factors for the poor development of the region.

Fishers in the Sundarbans are organized largely into two unions—the United Fishermen’s Association³⁶ and the Sundarban Matsajibi Joutha Sangram Committee³⁷.

The 24 Parganas South District has 6,205 mechanized craft³⁸, 1,028 motorized craft and 6,046 non-motorized craft fishing in marine waters (CMFRI, 2005). The mechanized fishing vessels in the 24 Parganas South District include trawlers, large gillnetters and

³² Government of West Bengal. 2005. Annual Report 2004-05, Department of Fisheries, Aquaculture, Aquatic resources and fishing harbours.

³³ Along the banks of the rivers/ channels.

³⁴ The myths and belief systems include practices of Bonbibi, Dakshin Rai, Gazi, Ganga, Saha-Jangali and Kasthadevi.

³⁵ http://www.sadepartmentwb.org/Introduce_3.htm

³⁶ An organization with a major political influence of the Socialist Unity Centre of India (SUCI).

³⁷ Joint Committee for Struggle of Sundarban Fishermen, linked with the Dakshin Banga Matsyajibi Forum and the National Fishworkers’ Forum. It is a federation of fishers’ organizations that are either independent or operate under the influences of different political parties. There are 3,000 members in the federation.

³⁸ The number of trawlers is 579; gillnetters, 3,805; liners, 66; *dol*-netters, 1,664; and others, 91. No information is available on the number of craft fishing in the inter-tidal and inland waters.

dol-netters, fishing outside the Sundarbans forest area, in the Bay of Bengal. *Naukas* are the traditional boats used in the inland waters of Sundarbans, which range from 24 ft to 42 ft in overall length³⁹. Some of the motorized boats fishing in the reserve forest area have motors of 12 hp to 24 hp.

Figure 3: District Map of West Bengal



Source: Maps of India

The common gear used in the Sundarbans are dragnets (*sarengijal, berjaal*), shore seines (*jaqnga jal, kochal jal*), stakenets (*charpata and khalpatta*), gillnets (*galsha*), and fixed bagnets (*beoundi ja, bindi jal*) (Mukherjee, M. 2007) These are used in the inland waters of the Sundarbans (Appendix V) and in the inter-tidal waters. The fishing gears that are considered destructive include the small mesh-sized *beoundi jal* and other fine-meshed nets. Besides these, castnets and hooks-and-line are also used. The common fish caught in the inter-tidal waters are *bhetki (Lates calcalifer)*, *shimur, gandu* or *medha mach, chingree (shrimp), selia, chadba, bavta* and red shrimp.

The significant inland fish landing centres in the Sundarbans include Canning, Herobhanga and Gosaba⁴⁰. Fishers in most of the remote islands do not have access to ice or other means to preserve their catch, and are often forced to travel to Canning or Gosaba to sell their catch on the same day itself, or transfer the catch to fish merchants who come to the villages. The fish depot owners, as the fish merchants (*Aratdars*) are

³⁹ Nylon nets cost Rs 310 per kg, and floats cost Rs 400 per kg. Usually the nets are 150 ft to 180 ft long. The total cost of investment varies between Rs 25,000 to Rs 45,000, depending on the size of the boat, inclusive of the cost of the net.

⁴⁰ Other landing centers deemed important by the Fisheries Department are Nazat, Kakkdip, Frazerganj, Buraburir ghat, Bakkhali, Namkhana, Jambu, Chemaguri, Hatipitha, Maragoli, Haribhanga, Sagar, Boatkhali, Roydighi, Domkhal, Sitarampur, and Kauamari.

called, also play the role of moneylenders, serving fishers who often do not have the money to buy boats and nets and to cover the running costs⁴¹ of fishing. The *Aratdars*, besides lending money, also arrange for the marketing of the catch from the villages⁴². Fishers are often indebted to the *Aratdar* for years on end.

In 2005-06, West Bengal recorded the highest fish production in India of 1.2 mn tonnes, of which 1.09 mn tonnes were from inland resources (GOI 2006). The Fisheries Department records show separate data for inland fish production for the districts of North and South 24 Parganas (Appendix VI).

Part III: Livelihood Issues in the STR

Though there are no human settlements inside the designated PA, communities living in fringe areas depend on the resources in the PA for their livelihoods. This livelihood dependence needs to be seen in the context of the discussion in the earlier section—communities living in the area have few livelihood options, and given poor access to even basic services, lack the opportunity to develop skill sets that could enable them to diversify their livelihoods in any sustainable way.

Since the 1980s, fishers in the Sundarbans have, however, had to face an increasing number of regulations, as earlier discussed. A cap has been put on the number of boats allowed to fish legally within the permitted areas; closed seasons and other restrictions have been introduced; and systems for registering and booking violations have been put in place, after the designation of the National Park and the wildlife sanctuary. These restrictions and regulations have meant that people have had to look for other livelihood options to survive. Some people, for example, shifted to collection of tiger prawn seed⁴³. However, intensive seed collection has an impact on the region's ecosystem and on the sustainable use of resources, and hence is not a viable long-term livelihood option.

Socioeconomic data about the numbers of people in the area dependent on resources within the STR, the manner in which they have been affected, and the options they have explored to cope, remains unavailable. Though most of those fishing in the STR are men, women and children are known to have been involved in activities such as catching prawn (*meendharas*). The women have also lost their sources of livelihood as they are now prohibited from fishing in the creeks near the Critical Tiger Habitat and Reserve Forests, and also from collecting prawn seeds near the shores of the inhabited islands.

Discussions with fishing communities across the 24 Parganas South District, who depend on the resources in the STR for their livelihoods, highlighted some of their major

⁴¹ Operational costs per trip for fishing, is Rs 2,000 to Rs 2,500 (cost of ice, permits, onboard food and fuel).

⁴² Of the sales proceeds, the Aratdar gets 20 per cent (10 per cent for marketing costs); 40 per cent goes to the crew, and 40 per cent is for the fisher (owner of the craft, gear and BLC) who borrows the money.

⁴³ Dhar, Ratna in Mandal 2007

concerns regarding the implementation of PA regulations, with implications for their livelihoods and incomes; these are discussed below.

BLCs

One of the main issues highlighted by fishing communities is that the number of BLCs has remained fixed since 1980. Fishers point out that the process for distribution of BLCs was problematic in the first place. Fishers were required to register within a month of the notification. Many fishers, particularly those in remote villages, were unable to do so, and were thus not issued BLCs. The Forest Department, however, maintains that BLCs were issued to all those who had applied for them.

Fishing communities also point out that though the population dependent on fishing has increased in the interim period, the number of BLCs has remained fixed—no new BLCs have been issued subsequently. At present, only 709 BLCs are active, leaving most of the other fishers without BLCs. Even though the Forest Department has recently estimated that the number of inactive BLCs is 104, no procedure has been initiated, as yet, to redistribute BLCs to active fishers.

Informal arrangements exist within villages for active fishers who wish to fish, to lease BLCs from the owners, thus making the BLC a “leasable property”. Fishers who cannot afford to pay the lease amount have little option but to fish illegally in the permitted areas, given that there are few other livelihood choices available.

Fishers highlight that the BLC owner list has not been updated—many owners have retired from active fishing or have died. The Forest Department states that the *zila parishad* offices and fishworker organizations have been repeatedly asked to update the list, but that has yet to be carried out. It was only recently, in 2007, that transfer of BLCs to blood relations was allowed, and formal procedures developed for transfer, requiring mandatory assent of the village *panchayat raj* institution. For the fishers, this implies a lengthy and complicated process.

Permits

The mandatory procedure for renewing fishing permits (recorded as the amount paid for use of dry fuel during fishing trips) after 42 days is also problematic for fishers, as often fines are levied when renewal is not done on time. Fishers highlight that sometimes they do not wish, or are unable, to renew the permits after 42 days for various reasons—they may not be interested in continuing fishing over the next period; they may be engaged in some other livelihood activity; or they may lack accessibility to the Forest Range Office. However, these reasons are not regarded as valid by the authorities, and fishers are fined on the grounds that they have overstayed in the permit areas. The Forest Department says it is very difficult for their officers to keep track of the actual number of fishers if the licences are not renewed on time, and the fine amounts levied are reasonable.

Fines and offences

The Forest Department in the Sundarbans region reports violations under three categories—prosecution report/charge sheet cases (POR), compounded offence report (COR) and offence detected offenders not found (UDOR)⁴⁴. Violations related to fishing are recorded under COR, and a fine amount (termed as compensation in official records) is collected from fishers for such offences. Reports from 2000-01 to 2007-08 show that COR offences, that is, violations for which fines are collected, but which are not charge-sheeted and taken to court, have drastically increased from 361 to 2,086 (Appendix VII), while there has been no such increase in the other two types of violations. The Forest Department highlights that the increase in number of violations could also be due to the large number of fishers now moving to the STR area to fish, as there is not much fish available outside the area.

Fishers in the area find it difficult to understand the maze of rules and regulations applicable to the various types of PAs, and the categories therein. They are also not familiar with the categorization of offences and the schedule of fines applicable to each kind of offence. The violations and other details are recorded at the back of the BLC in English, a language incomprehensible to them. Under the circumstances, fishers feel more or less helpless and unable to raise any credible plea, even if they feel they have been booked for a violation they have not committed, or if they believe that the fine amount is not proportionate to the kind of violation committed. This often leads to misunderstanding at the time of the BLC's renewal, when the fine amount termed as 'compensation' needs to be paid. Fishers say that, on an average, they pay fines at least four times in a year.

Problems faced by motorized vessels in accessing their fishing grounds

As mentioned, only fishing by non-motorized boats is allowed within the PAs, including in the STR. Since the motorized boats of fishers living in the fringe areas of the STR are not allowed to navigate through the buffer area and the core area, they are forced to take long detours to reach their fishing grounds. There is no provision to allow innocent passage. These detours are time-consuming and fuel-intensive, increasing operational costs. As a Jharkhali-based fisher said, "We take a detour of 12 hours to go to the sea to fish, though there is a route straight through the STR (core) to reach the sea which takes only six hours. We are compelled to spend on an additional six hours of fuel, for which we incur a loss, with no compensation."

Human-animal conflicts

In recent years, the numbers of people killed by tigers within the STR and outside has increased. The Annual Report of the STR reports that five people were killed between 2003-04 and 2005-06, while media reports indicate a much larger number. This is despite the fact that the Forest Department has taken the initiative to net in the tiger habitat. One reason for the rise in human-animal conflicts could also be because two ranges near the

⁴⁴ POR offences are those that are booked as cases, and sent to court, while UDOR are violations that are detected, usually visually, but where the violator are not caught. COR includes violations that are fined, but are not charge-sheeted and taken to court.

Sajnekhali Wildlife Sanctuary have not been completely netted because of the creeks, which also resulted in the deaths of people living in the fringe areas. Families of fishers killed are paid a compensation of Rs 100,000 by the Forest Department. This, however, is provided only to those who are engaged in fishing as, according to the rules; no form of assistance is provided when the death occurs in the prohibited/ protected zones of the Sundarbans. For families, especially for the wives of the fishers killed, the lack of any compensation makes survival very difficult.

Lack of consultation with women

As fishing is considered primarily a male domain, the administration interacts mainly with the men. The fact that women are, in cases, directly involved in fishing activities, is often overlooked. Also overlooked is the fact that women face the repercussions of the restrictions on fishing, the levy of fines, and the confiscation of catch. Several women have been left to cope on their own after their men were killed in tiger attacks. Management plans and other notifications do not take into consideration the impact on the women in the community, or the need to consult them. However, SHGs have been formed in the fringe communities of the STR, in which women are actively involved and consulted for various non-forest-related activities.

Views of fisher unions

The two major fisher unions in the area have different opinions on what needs to be done to protect the livelihood interests of fishers fishing in the STR area. The United Fishermen's Association, affiliated to the Socialist Unity Centre of India (SUCI), advocates the removal of all restrictions on fishing. The views of the Sundarban Matsajibi Joutha Sangram Committee⁴⁵ are best captured by the following statement: "*Bidhinishder manobik chehra thakadorkar*" ("Restrictions should have a human face")⁴⁶. The union wants fishers to be consulted while designating the core of the STR and while deciding upon fishing regulations, in line with the WLPA provisions. They stress that the focus should be on identifying the real causes of mangrove destruction and reduction in fish stocks, rather than blaming only the fishers. They point out that factors such as development of tourism, pollution and sedimentation, have negative impacts on the local ecology and habitat, as well as on the livelihoods of fishers.

Part IV: Initiatives Undertaken to Address Livelihood Issues

This part of the study draws attention to the initiatives taken by various agencies, both governmental and non-governmental, to provide alternate and alternative livelihood⁴⁷ options to reduce the dependence on resources within the STR.

The EDCs and FPCs initiated by the Forest Department, as one of the mechanisms for involving people in the management of PAs for effective conservation, are also involved

⁴⁵ Joint Committee for Struggle of Sundarban Fishermen, linked with the Dakshin Banga Matsyajibi Forum and the National Fishworkers' Forum.

⁴⁶ Fishworker leader Kodidas Haldar of Gosaba, CPI-M.

⁴⁷ Alternative livelihood options are long-term options to reduce dependence on fishing as a livelihood, while alternate livelihood options are short-term, seasonal livelihood options to provide an income during periods when fishing cannot be undertaken due to restrictions.

in initiating alternative livelihoods and development activities in villages along the fringes of the STR⁴⁸. Activities through the FPCs/ EDCs are currently taken up only in 25 villages⁴⁹. Activities undertaken include providing drinking water, and developing irrigation facilities, brick pathways and jetties, besides training and awareness building. One of the objectives of the FPCs is to create awareness among people about regulations in place, so that they do not enter the PA. Alternate livelihood options provided through the FPCs include poultry farming, social forestry, digging ponds and making roads⁵⁰.

In the case of EDCs, the Bon-O-Bhumi Sanskar Sthayee Samiti wing of the local *panchayat raj*, along with the local officer from the Forest Department (who is also the joint convener), selects the EDC members⁵¹. The activities of the EDCs are linked with conservation efforts and include sharing of benefits from activities such as tourism.

The SDB is also involved in developing alternate livelihood proposals within the framework of sustainable development in non-forest fringe areas. The major activities undertaken are poultry, dairying, sheep, goat and duck rearing, and freshwater pond fish culture. Often these activities are channelized through women's SHGs⁵².

Studies indicate that while some activities, such as goat rearing, have been successful in certain villages, market linkages can be enhanced for poultry farming, and the indigenous variety of ducks should be promoted as they were preferred by local communities for rearing. There is thus a clear need for consultation with local people before undertaking livelihood activities (Ratna Dhar in Mandal, ed, 2007: 205-240). Many activities, routed through the SHGs, are seen to have benefited women placed relatively higher in the class hierarchy. It has also been noted that EDCs/FPCs are gender-neutral, in that each household can be represented by one member, who could be either a male or a female.

Ecotourism

One of the focus areas since the establishment of the PAs has been on developing tourism as a means of economic development for local villages⁵³. Tourism has been actively developed in the Gosaba block, close to the Reserve Forests in 24 Parganas South

⁴⁸ The 1996 Resolution on EDCs begins by stating that the Forest Department has taken up a programme of conservation and established PAs, "the successful implementation of which, depends to a large extent on active participation and involvement of local people".

⁴⁹ 22 villages in Gosaba block and 3 villages in Hingalgunj block, 24 Parganas South District

⁵⁰ These initiatives are meant to reduce reliance on natural resource concentrations in the Core Area by being the social buffers as prescribed by the compendium of guidelines and circulars issued by the director of Project Tiger in November 2004.

⁵¹ The Range Officer and Beat Officer are representatives of the Forest Department at the field level.

⁵² There are around 12 to 14 (at most, 20) SHG groups in the Jharkhali region alone. Some are trying to generate income from schemes such as the Swarn Jayanti Gram Swarajgar Yojna (SJGSY) scheme of the Government of India. They have taken up activities such as social forestry, animal husbandry, marketing and aquaculture in small ponds.

⁵³ Mandal, Debrata, ed. (2007), 'Man in Biosphere: A Case of Sundarbans Biosphere Reserve', Anthropological Survey of India, Published by Gyan Publishing House, New Delhi.

District⁵⁴. Though ecotourism acts as a seasonal alternative livelihood option, especially for educated youth, the current patterns of sharing the benefits of ecotourism among various stakeholders—local people, tourists and the agencies facilitating tourism, such as governmental and non-governmental organizations—are not equitable⁵⁵. It has further been noted that while tourism is beneficial as a seasonal income, it also involves a change in land-use patterns. At the same time, water bodies, and activities such as drying fish and prawn seed collection, are affected. Tourism-related activities have sometimes led to bund erosion, pollution and oil spills (Sudhansu Gangopadhyay, in Mandal, ed, 2007:41). In recent years, efforts of industrialists, such as the Sahara Group, to develop tourism in the region outside the STR, have met with mass protests from local people, given their potentially large impact on the ecosystem.

In general, the alternative livelihood options currently available remain limited. Fishers highlight the need to explore viable long-term alternatives rather than focus on short-term alternate livelihood options, if the pressures on natural resources have to be reduced.

Part V: Conclusion

This study has highlighted the livelihood issues in implementation of protection measures in the STR. Clearly, these are issues that need to be studied further and addressed, in the interests of both social justice and effective conservation. In this context, it is relevant to note that the recent amendment to the WLPA (2006) specifically mentions that the demarcation of Core or Critical Tiger Habitat areas of National Parks and Sanctuaries should be based on scientific and objective criteria, for the purpose of tiger conservation, without affecting the rights of the Scheduled Tribes or other forest dwellers. In the case of the buffer or peripheral area of the tiger reserves, the WLPA makes provisions for promoting co-existence between wildlife and human activities, with due recognition of the livelihood, developmental, social and cultural rights of the local people. It also specifically calls for the involvement of the *gram sabha*⁵⁶.

The Tiger Task Force, set up in 2005, in its recommendations, highlights the importance of reinvigorating the institutions of governance. It calls for an inclusive approach to conservation, where community institutions are involved in the management of tiger reserves, and as a way of reducing conflicts. The Task Force also recommends the

⁵⁴ Tourism spots in the STR are Sajnekhali Mangrove Interpretation Centre, Sudhanyakhali, Dobanki, Netidhopani, and Burirdabri (Amitava Dinda in Mandal, ed, 2007:246,247).

⁵⁵ The opportunities are mainly in the service industry that maintain the structural and class inequalities between the locals and the tourists. For example, a study of ecotourism in Dayapur village, Satjelia Gram Panchayat, mentions how the people have taken to transporting and marketing goods such as biscuits and tender coconut water, creating some employment. The study also shows how the geographic position of honey sellers, and packaging gives some honey vendors an edge. The EDCs of villagers are entitled to a share of 20 per cent of the profits of the government revenue from tourism, provided that the Forest Department officials in charge are satisfied with the annual performance of the EDC.

⁵⁶ While the WLPA does not provide a definition of what constitutes a *gram sabha*, the recent Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, defines a village assembly as consisting of all adult members of a village, and, in the case of States having no *panchayats, padas, tolas* and other traditional village institutions and elected village committees, with full and unrestricted participation of women.

regeneration of the forest habitats in the fringes, so as to benefit the economies of local people.

It is also relevant to take note of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, which recognizes the rights of forest-dwelling Scheduled Tribes and other traditional forest dwellers residing in such forests, and those who are dependent on the forests for bona fide livelihood needs. According to the Act, forest rights include community rights of use of, or entitlements to, resources, such as fish and other products of water bodies. A circular issued by the Ministry of Tribal Affairs in 2008 specifies that even Scheduled Tribes and other traditional forest dwellers who are not necessarily residing inside the forest but are dependent on the forest for their bona fide livelihoods, are covered under the Act⁵⁷. This provision is important and should be taken into consideration in the case of communities dependent on natural resources in the STR and in the Reserve Forests.

In conclusion, it is important that an effective conservation strategy in the Sundarbans is built on provisions recognizing community rights and participatory approaches within the existing legal frameworks. The need is thus to move towards a holistic and balanced approach to protection and propagation of wildlife and habitat, built on participatory, livelihood-sensitive approaches and the principles of sustainable development.

Part VI: Recommendations

The Sundarbans, a unique ecosystem, is an important breeding ground of fish and a habitat for tigers. It is also home to a large population of people living in scattered, often remotely located, islands, with poor access to basic facilities such as health, education, roads, sanitation, potable water and electricity. Livelihood options are limited, and fishing is one of the most important sources of livelihood.

In the STR area, the focus has been on the formulation and implementation of measures for protection of the tiger and its habitat. At the same time, efforts have been taken to address the livelihood concerns arising from the implementation of such measures, as discussed in the earlier sections of the study. All such initiatives to address livelihood issues within the STR and to enhance participatory processes, need to be further developed and consolidated, recognizing the right of local populations to a decent and dignified livelihood. It is also essential to address other, as yet unaddressed or inadequately addressed, livelihood concerns highlighted by fishing communities in the areas, as outlined below:

Forest and fishing regulations

- *BLCs*: There is a need to re-assess the status of fisheries resources within the Sundarbans, and, if necessary, to reissue or issue new BLCs. Provisions should also be made to assess the number of active fishers without BLCs, and to reissue the

⁵⁷ Ministry of Tribal Affairs: Circular No. 17014/02/2007-PC&V (Vol.VII), dated June 9, 2008 on implications of the phrase “primarily reside in and who depend on the forests or forest lands for bona fide livelihood needs” appearing in section 2(c) and 2 (o) of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.

inactive BLCs to them. Priority needs to be given to fishers who were unable to apply for BLCs at the time of the original allocation. The process of renewal of BLCs/permits should be made easier, as well as efficient, accountable and transparent, and fines should not be charged for non-renewal of licences.

- *Fines*: The Forest Department should develop transparent guidelines, in a consultative and participatory manner, detailing the fine amounts to be paid (as 'compensation') for offences compounded. These amounts should be proportionate to the nature of the violations in the STR and other PAs, and to the socioeconomic status of fishers living in the Sundarbans. The fine charts thus developed, with information on the type of offence and the corresponding fine amount, would help in reducing mistrust and in improving compliance and implementation. Efforts must be taken to widely disperse this information among fishing communities. Efforts also need to be made to note violations in the local languages, to enable fishers to understand the offence and, if required, to plead their innocence. This should also be effectively implemented.
- *Innocent passage*: There should be provisions to allow for innocent passage of motorized vessels through the buffer zone of the STR. This passage can be regulated by providing navigational channels, and co-ordinates can be marked on maps with global positioning system (GPS) readings. Such maps can be distributed to the fishers in the local language, and they could be trained to read them.
- *Patrolling*: Fishing communities should be involved in patrolling the PAs, along with the Forest Department, and community enforcement measures could be developed, to ensure effective compliance and to reduce conflicts.
- *Community participation*: Communities need to be consulted in formulating rules and regulations, and in formulating and implementing management plans. These plans should be made accessible to people in local languages, and fishing communities should be educated on the various regulations, so as to ensure effective compliance with regulations. It is also important to involve community institutions that exist at the village level in decisionmaking and implementation, to reduce conflicts and enhance conservation effectiveness, as recommended by the Tiger Task Force.

Institutional co-ordination

It is important that different agencies in the Sundarbans region co-ordinate their work, particularly to ensure development of basic infrastructure and services. The Fisheries Department, in particular, should be actively involved in ongoing assessment of fisheries resources; systematic collection of data on fish landings, craft and gear; studying the impact of the different gear used in the Sundarbans; and enhancing the marketing linkages and prices obtained by bona fide fishers through strengthening co-operatives, among other things.

Training and capacity building

There is need for training and capacity building of Forest 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 conservation. It is also important to provide training for fishing communities on the importance of conservation of habitats for the sustainable use of resources, and build their capacities to function as custodians of the resources.

Lives and livelihoods

The WLPA highlights the need to ensure that the agricultural, livelihood, developmental and other interests of the people living in tiger-bearing forests or tiger reserves are taken into consideration while preparing tiger conservation plans. The WLPA also mentions that the plans should include provisions for alternative packages for the livelihoods of affected individuals and communities, consistent with the requirements of the National Relief and Rehabilitation Policy. The following proposals thus need to be considered:

- *Socioeconomic data:* As mentioned earlier, there is no gender-segregated socioeconomic data on fishing communities who are dependent on the fisheries resources in the STR. This lacuna must be immediately addressed, as this base information is required for any decision-making process and to formulate livelihood strategies for fishing communities dependent on the STR. It is also important to physically mark villages on maps, to visually represent their location with respect to the STR and their levels of dependence. This is also one of the recommendations of the Tiger Task Force.
- *Alternate/Alternative livelihoods:* Efforts to develop sustainable and long-term viable options for communities, developed in consultation with them, are critical. For any such option to be viable, it is imperative to improve access to basic services, such as health, education, training and capacity building, and to basic infrastructure. This would help in developing other skills and in reducing pressure on natural resources in the longer term. Alternate livelihood options (both in the fishery and outside it) should be explored, based on proposals from fishing communities, and could also include options such as enhancing market linkages and the prices received by actual fishers, apart from the options that are currently being explored.
- *EDCs/FPCs:* The number and coverage of EDCs and FPCs in the Sundarbans region needs to be increased. Participation of fishing communities should be ensured while designing the objectives and activities of the EDCs/FPCs, ensuring that the focus is as much on social issues as on issues of resource protection and management. The structure, process of functioning and benefit-sharing mechanisms of these committees should be reviewed regularly, with the participation of the local communities.
- *Tourism:* It should be ensured that tourism developed in the region is low-impact and is undertaken in a sustainable manner, maintaining the integrity of the ecosystem. Policy guidelines ensuring equitable cost-benefit sharing mechanisms for ecotourism need to be developed, keeping in mind the proportionality principle so that the worst-affected community members get a larger share of the benefits. Employment options such as working as tour guides can be considered for at least some fishers, who have knowledge of the creeks and the terrain, and have specialized navigation and fishing skills.
- *Credit and marketing:* Fishing communities need to have access to a formal system of credit and marketing, which ensures them better returns and could thus reduce their incentive for taking undue risks to eke out a living.
- *Women's livelihoods:* It is important to understand the role of women in fishing communities, and the manner in which they are being affected by the legal regulations in place. Livelihood proposals need to be developed with a gender perspective, and in

consultation with women themselves. Women also need to be part of the process for formulating and implementing management plans and regulations, given that they are directly affected by protection measures.

- *Human-animal conflicts:* It is critical to enhance the efforts already being taken to reduce human-animal conflicts, and to reduce the compulsions that are driving communities to venture into Core Areas where chances of tiger attacks are higher. It is important to provide compensation to the families of all fishers killed, irrespective of where the deaths occurred. In the longer term, developing alternative livelihoods through enhancing the skills of local people and improving their incomes and quality of life, should work to further reduce human-animal conflicts.

Addressing other threats to the ecosystem

Pollution by developmental activities, including from industrial activities and sewage, is a major threat to the fragile ecosystem of the Sundarbans. It is critical to address these 'non-fishing', but high-impact, threats.

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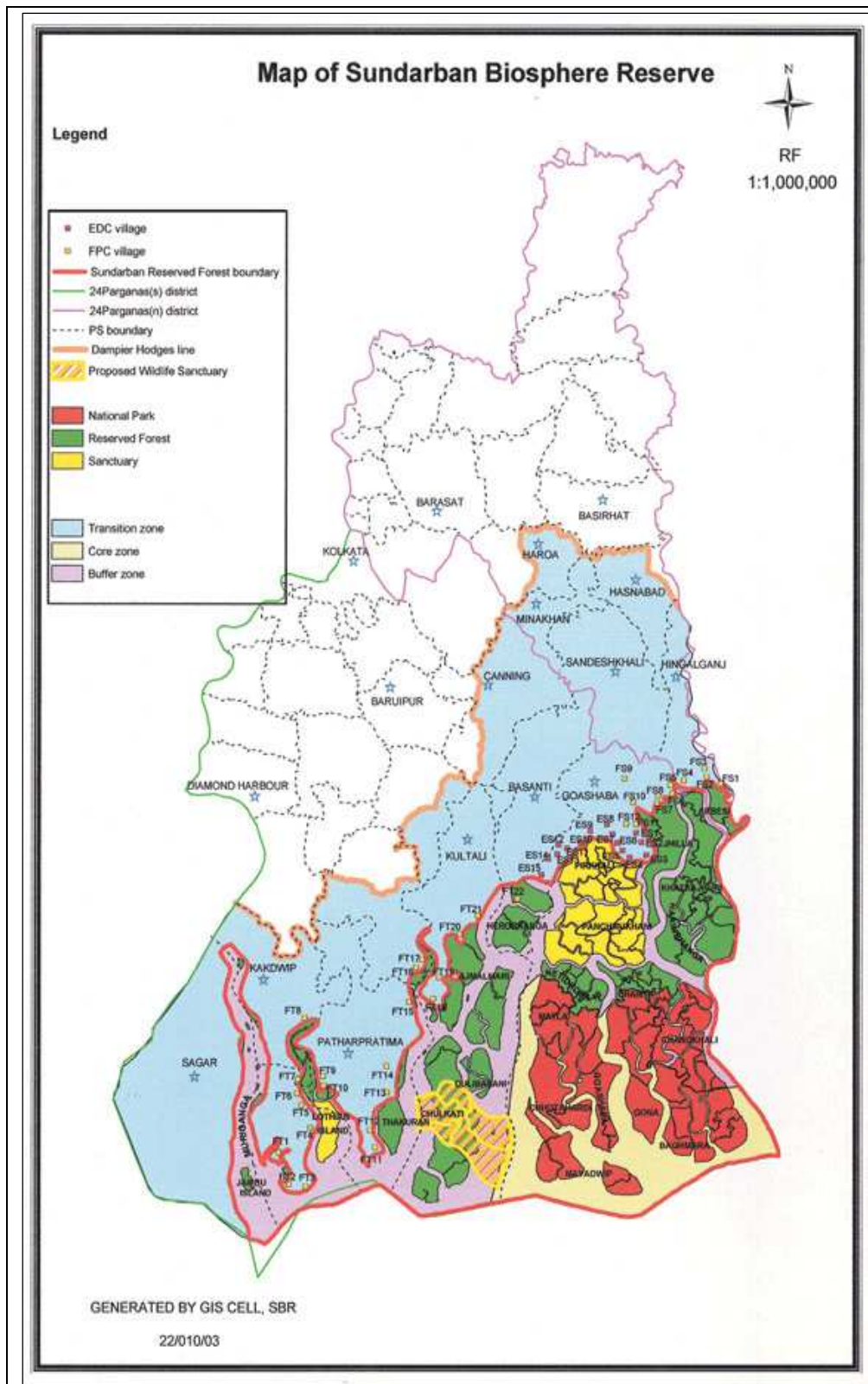
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Appendix I : Map of the Sundarban Biosphere Reserve



Appendix II: List of EDCs and FPCs

14 EDCs: Satyanarayanpur, Amlamethi, Mathurakhanda, Bali, Bijoynagar, Sonaga, Dulki, Pakhiralaya, Dayapur, Jamespur, Annpur- Rajatjubilee, Lahiripur-Chargheri, Lahiripur- Santigachi, Laxbagan- Parasmani

11 FPCs: Emlibari, Mitrabar, Gobindapur, Kalidaspur, Hentalbari, Bagnapara, Adibasipara, Kalitala-Pargumti, Hemnagar, Samsernagar, Bhuruliapara

Source: Email communication with the Field Director, STR, dated 30 September 2008

Appendix III

Number of Boat Licence Certificates

NAME OF RANGE	ACTIVE BLC	INACTIVE BLC	TOTAL
BASIRHAT	204	92	296
SWLS*	416	62	478
HQ/CANNING	89	10	99
BLC UNDER CONSIDERATION			41
GRAND TOTAL			914

* SWLS- Sajnekhali Wild Life Sanctuary

Source: Email communication with the Field Director, STR, dated 30 September 2008

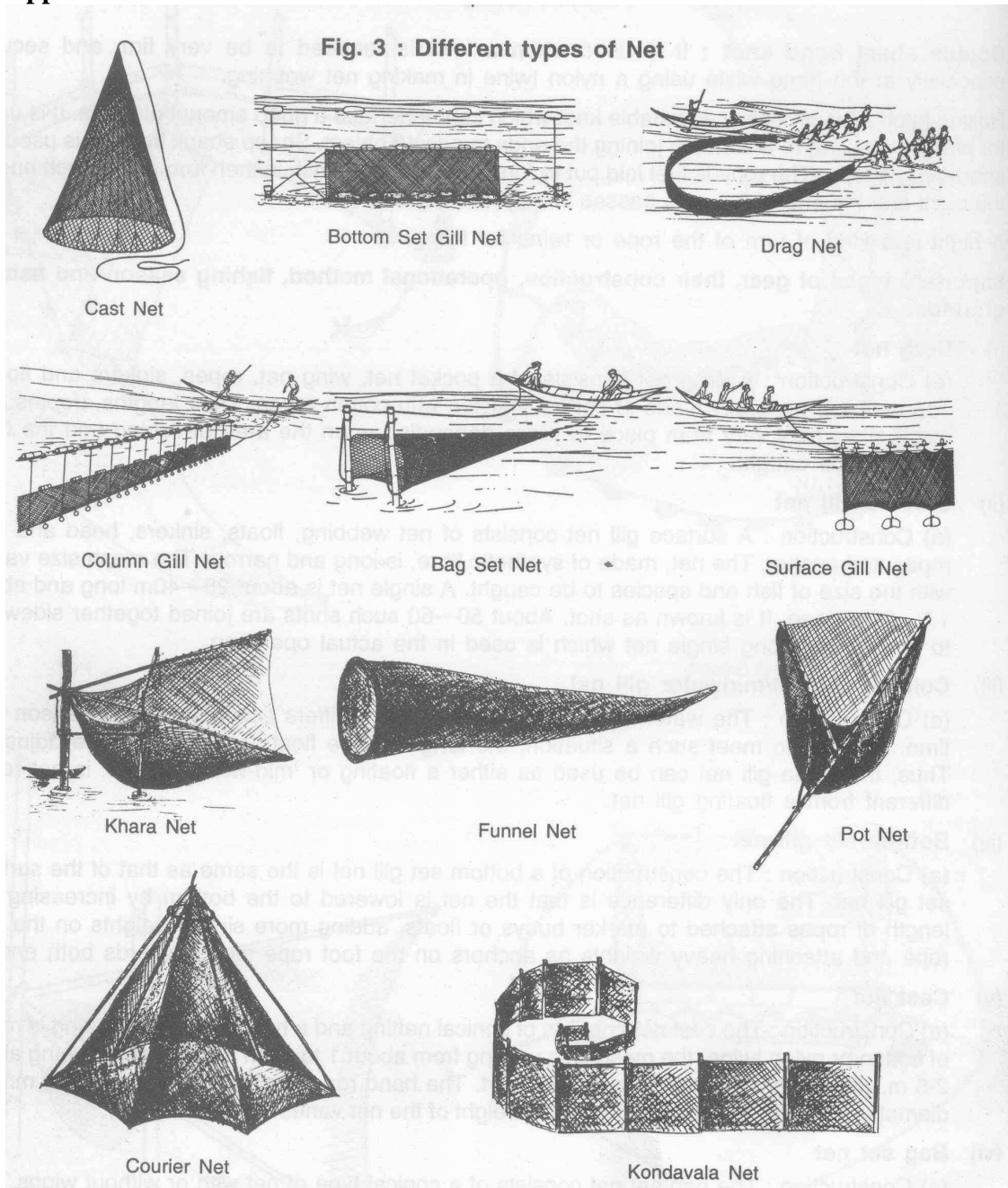
Appendix IV

Annual fees for issuance of BLCs

- | | |
|------------------------------|--------------------------------|
| • 10 Qt. Boat = Rs. 15 | • 120 to 200 Qt Boat = Rs. 50 |
| • 10 to 20 Qt. Boat = Rs. 20 | • 200 to 400 Qt Boat = Rs. 100 |
| • 20 to 40 Qt. Boat = Rs. 25 | • Over 400 Qt Boat = Rs. 150 |
| • 40 to 120 Qt Boat = Rs. 30 | |

Source: Email communication with the Field Director, STR, dated 30 September 2008, and the Guidelines for Schedule of Rates

Appendix V



Source: Mukherjee, Madhumita. 2007. 'Sunderban Wetlands'. Eds. Department of Fisheries, Aquaculture, Aquatic Resources and Fishing Harbours, Government of West Bengal. Kolkata

Appendix VI

Inland fish production, 2006-07 (in tonnes)

Inland production	Fish	Prawn
24 Parganas North District	1,30,451	40,516
24 Parganas South District	1,80,815	9,900

Source: Department of Fisheries, Aquaculture and Aquatic Resources, Government of West Bengal, Annual Report 2006-07

Appendix VII

Number of violations (2000-01 to 2007-08)

Year	POR (in number)	COR (in number)	UDOR (in number)
2000-01	34	361	106
2001-02	14	384	177
2002-03	15	640	189
2003-04	22	679	173
2004-05	12	983	149
2005-06	14	1462	150
2006-07	14	2427	121
2007-08	13	2086	82

Compiled from STR Annual reports and from e-mail communication with Field Director, STR, dated 30 September 2008

NB: POR – Prosecution report /charge sheet cases.
 COR – Offence Compounded
 UDOR – Offence Detected Offenders not found